

# TELE-TECH

## & THE ELECTRONIC INDUSTRIES DIRECTORY

JUNE, 1953

**FRONT COVER: GRAPHICAL SYMBOLS FOR ELECTRICAL DIAGRAMS**—A preview of more than 50 symbols included in a new standard now undergoing final review. Over 700 symbols will appear in this new standard which, when released, will be known as American Standard Y 32.2; IRE standard 53IRE21S1. The military equivalent will be MIL-STD-15A. Availability of the IRE standard is expected by next fall. See pages 80 and 81 for definitions of symbols appearing on the cover.

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Publishers also of TELEVISION RETAILING

\* Reg. U. S. Pat. Off.

TELE-TECH'S CIRCULATION, 21,000

Because of the lag in auditing, never catching up with current circulation in an expanding industry, an audit for the calendar year 1953 will not be made until the summer of 1954. Meanwhile, sworn statements and past office receipts will be furnished covering the guaranteed 21,000 circulation.



# ELECTRON TUBES

*for* Broadcasting and Industry

## TRANSMITTING TUBES

TYPE	CATHODE			MAXIMUM ANODE RATING				FULL INPUT FREQ. MCS.	COOLING
	VOLTS	AMPS	MU	VOLTS	AMPS	INPUT WATTS	DISS. WATTS		
ML-2C39A	6.3	1.0	100	1000	0.125	125	100	2500	Forced-Air
ML-207	22.0	51.0	20	15000	2.0	30000	10000	1.6	Water
ML-212E	14.0	6.0	16	3000	.350	—	275	1.5	Convection
ML-220C	21.5	41.0	40	15000	1.5	—	10000	4	Water
ML-220CA	21.5	41.0	40	15000	1.5	—	5000	4	Forced-Air
ML-228A	21.5	41.0	16	6000	1.5	—	5000	3	Water
ML-232B	20.0	60.0	40	20000	3.0	—	25000	3	Water
ML-240B	21.5	41.0	40	12000	1.7	—	10000	20	Water
ML-241B	14.0	6.0	16	3000	.350	—	275	7.5	Convection
ML-242C	10.0	3.25	12.5	1250	.150	188	100	6	Convection
ML-279A	10.0	21.0	10	3000	.800	—	1200	20	Convection
ML-298A	27	225	32	20000	11.0	—	100000	4	Water
ML-298B	27	225	57.5	20000	11.0	—	100000	4	Water
ML-342A	20.0	67	40	20000	2.5	—	25000	4	Water
ML-343A	21.5	57.5	40	18000	2.0	—	10000	4	Water
ML-343AA	21.5	57.5	40	18000	1.5	—	5000	4	Forced-Air
ML-356	7.5	170	20	12500	6.0	60000	22500	25	Water
ML-357B	10.0	10	30	4000	0.5	1600	400	110	Convection
ML-379A	10.0	21.0	10	3000	.800	—	1200	20	Convection
ML-381	6.3	1.0	100	3500	0.01*	35*	35*	3000	Forced-Air
ML-450TH	7.5	12.0	38	6000	0.6	—	450	40	Convection
ML-833A	10.0	10.0	35	4000	0.50	1800	400	20	Forced-Air
ML-880	12.6	315	20	10500	6.0	60000	20000	25	Water
ML-889A	11.0	120	21	8500	2.0	16000	5000	50	Water
ML-889RA	11.0	120	21	8500	2.0	16000	5000	40	Forced-Air
ML-891	22.0	60	8.5	12000	2.0	18000	6000	1.6	Water
ML-891R	22.0	60	8.5	10000	2.0	15000	4000	1.6	Forced-Air
ML-892	22.0	60	50	15000	2.0	30000	10000	1.6	Water
ML-892R	22.0	60	50	12500	2.0	18000	4000	1.6	Forced-Air
ML-893A	20.0	183	35	20000	4.0	70000	20000	5	Water
ML-893AR	20.0	183	35	20000	4.0	70000	20000	5	Forced-Air
ML-5530	5.0	55	26	5000	1.75	8750	3000	110	Forced-Air
ML-5531	6.3	92	22	10000	3.75	30000	10000	30	Forced-Air
ML-5541	7.5	57	26	8500	2.75	23000	10000	110	Forced-Air
ML-5604	11.0	176	19.5	12500	3.0	32500	10000	22.5	Forced-Air
ML-5606	22.0	60	50	15000	2.0	30000	10000	1.6	Water
ML-5619	11.0	176	19.5	12500	3.0	32500	20000	22.5	Water
ML-5658	12.0	310	20	12500	5.0	60000	20000	20	Water
ML-5666	11.0	120	21	10000	2.0	20000	12500	22.5	Water
ML-5667	11.0	120	21	10000	2.0	20000	7500	22.5	Forced-Air
ML-5668	22.0	60	50	14000	2.0	28000	20000	5	Water
ML-5669	22.0	60	50	14000	2.0	28000	10000	5	Forced-Air
ML-5681	12.0	220	25	15000	12.0	150000	75000	30	Water
ML-5682	16.5	325	32	16000	20.0	300000	100000	30	Water
ML-6256	12.6	27	21	5500	1.5	7000	5000	110	Water
ML-6257	12.6	27	21	5500	1.5	7000	5000	110	Water
ML-6258	12.6	27	21	5500	1.5	7000	3000	110	Forced-Air

\*Duty cycle: 0.0033

## HIGH-VOLTAGE RECTIFIERS

TYPE	CATHODE		ANODE RATINGS		INSULATION	COOLING
	VOLTS	AMPS	INV. PKV	PEAK MA		
ML-102	20	19.0	75	750	Air	Convection
ML-103	10	11.5	125	78	Oil	Convection
ML-108	13	12.5	140	200	Oil	Convection
ML-110	10	11.5	140	78	Air	Convection
ML-115	10	11.5	125	100	Air	Convection
ML-120	13	12.5	140	200	Air	Convection
ML-121	10	11.5	140	100	Oil	Convection
ML-126	13	12.5	150	200	Air	Convection
ML-170	13	12.5	200	200	Air	Convection
ML-180	13	12.5	200	200	Oil	Convection
ML-199	12	23	110	10000	Air	Convection
ML-222A	21.5	41	25	5000	Air	Water
ML-5575/100	20	24	150	1000	Air	Convection
ML-5576/200	20	32	150	2500	Air	Convection

## MERCURY VAPOR RECTIFIERS

TYPE	CATHODE		TUBE VOLT. DROP	FIL. EXCIT.	COOLING	ANODE RATINGS		
	VOLTS	AMPS				INV. PKV	PEAK AMPS	AV. AMPS
ML-255B	5.0	19	15	Quad.	Forced-Air	20	20.0	5.0
ML-266B	5.0	42	15	Quad.	Forced-Air	20	40.0	10.0
ML-267B	5.0	6.75	10	Quad.	Convection	7.5	8.0	2.0
ML-315A	5.0	10	15	Quad.	Convection	12.5	8.0	2.0
ML-575A	5.0	10	10	In-Ph.	Convection	15	6.0	1.5
ML-673A	5.0	10	10	In-Ph.	Convection	15	6.0	1.5
ML-857B	5.0	30	15	Quad.	Forced-Air	22	40.0	10.0
ML-866A	2.5	5.0	15	In-Ph.	Convection	10	1.0	0.25
ML-869B	5.0	19	15	Quad.	Forced-Air	15	20.0	5.0
ML-872A	5.0	7.5	10	In-Ph.	Convection	10	5.0	1.25
ML-800B	5.0	7.5	10	In-Ph.	Convection	10	5.0	1.25

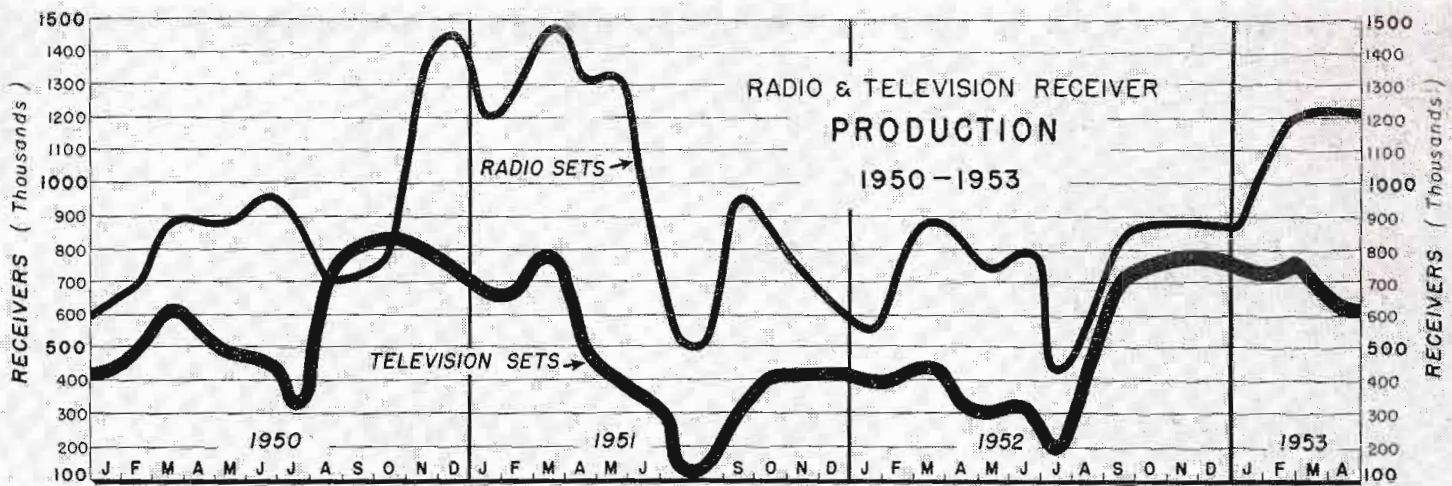
Machlett Electron Tubes are distributed in the United States by Graybar Electric Company, 420 Lexington Avenue, New York 17, N. Y., in Canada by Dominion Sound Equipments, Ltd., 4040 St. Catherine Street West, Montreal, Canada and in South America, Europe, Asia and Africa by Westrex Corporation, 111 Eighth Avenue, New York 11, N. Y.

**Note:** For complete additional technical data or prices, write to Machlett Laboratories, Inc., Springdale, Conn., or contact your nearest Graybar, Westrex or Dominion Sound Equipment office.

MACHLETT LABORATORIES, INC., SPRINGDALE, CONN.

OVER 50 YEARS OF ELECTRON TUBE EXPERIENCE





**Broadcast Stations in U.S.**

	AM	FM	TV
Stations on Air	2365	600	140 VHF & 27 UHF
Under Construction (CPS)	150	69	114 VHF & 220 UHF
Applications Pending	230	9	15 Educational VHF & 400 UHF

**Radio & TV Receiver Production**

	TV	Radio
April 1953	Home 300,000 Battery 172,000 Auto 532,000 Clock 205,000	300,000 172,000 532,000 205,000
Total Four months (Jan. April) 1953	620,000	1,209,000
Total	3,886,000	5,049,000

**TELEVISION SETS IN USE, JUNE 1, 1953**

Market Area	No. TV Stations	TV Sets in Use
Ames	1	156,000
Atlanta	3	350,000
Atlantic City	1	10,000
Austin	1	23,000
Baltimore	3	512,000
Binghamton	1	96,000
Birmingham	2	163,000
Boston	2	1,057,000
Buffalo	1	360,000
Charlotte	1	300,000
Chicago	4	1,560,000
Cincinnati	3	385,000
Cleveland	3	770,000
Columbus	3	264,000
Dallas—Ft. Worth	3	283,000
Davenport—Rock Island—Moline	2	212,000
Dayton	2	228,000
Denver	2	125,000
Detroit	3	873,000
Erie	1	107,000
Grand Rapids—Kalamazoo	2	217,000
Greensboro	1	134,000
Houston	1	225,000
Huntington	1	179,000
Indianapolis—Bloomington	2	410,000
Jackson	1	18,000
Jacksonville	1	125,000
Johnstown	1	191,000
Kansas City	1	299,000
Lancaster	1	185,000
Lansing	1	152,000
Los Angeles	7	1,440,000
Louisville	2	201,000
Memphis	1	213,000
Miami	1	132,000
Milwaukee	1	435,000
Minn.—St. Paul	2	372,000
Nashville	1	115,000
New Haven	1	364,000
New Orleans	1	166,000
New York	7	3,500,000
Norfolk	1	172,000
Oklahoma City	1	165,000
Omaha	2	185,000
Philadelphia	3	1,251,000
Phoenix	1	62,000

Market Area	No. TV Stations	TV Sets in Use
Pittsburgh	1	670,000
Portland	1	87,000
Providence	1	314,000
Richmond	1	158,000
Roanoke	1	60,000
Rochester	1	181,000
Salt Lake City	2	101,000
San Antonio	2	125,000
San Diego	1	145,000
San Francisco	3	660,000
Schenectady	1	281,000
Seattle	1	263,000
South Bend	1	45,000
St. Louis	1	500,000
Syracuse	2	190,000
Toledo	1	227,000
Tulsa	1	103,000
Utica	1	89,000
Washington	4	458,000
Wilkes Barre	1	60,000
Wilmington	1	130,000
Albuquerque	1	20,000
Brownsville—Matamoros	1	11,500
El Paso	2	22,000
Mobile	2	28,000
Peoria	1	20,000
Spokane	2	35,000
Bangor	1	10,000
Youngstown	2	32,000
Total Continental U.S. TV Sets		23,500,000
Honolulu		19,000
Montreal		56,000
Toronto		163,000
Grand Total, U.S., Canada		23,738,000

**Emerson Begins \$100,000 of Gifts to Educational TV**

During May, Station KUHT, University of Houston's educational TV station on Channel 8, was scheduled to be dedicated and go into operation—the first educational station to get on the air and first to receive a \$10,000 allotment out of the \$100,000 gifts earmarked by Emerson Radio & Phonograph Company for educational TV. At April 13 ceremonies in Texas' oil capital, Emerson's president, Benjamin Abrams, presented the initial \$10,000 check to University President W. W. Kemmerer.

The three-man committee which passes on all applications for the \$100,000 grant consists of Dr. James G. McDonald, former Ambassador to Israel; Dr. Leonard Carmichael, secretary of the Smithsonian Institute; and Dr. Orestes H. Caldwell, editorial director of *Tele-Tech & Electronic Industries*, and former Federal Radio Commissioner.

**GOVERNMENT ELECTRONIC CONTRACT AWARDS**

This list comprises a selected number of contracts, awarded by the government purchasing agencies indicated, in April 1953.

<b>Signal Corps Supply Agency</b> Philadelphia, Pa.	Batteries \$3,126,882	12-channel carrier telegraph 1,630,871	Power supplies 208,358	Hardware kits 30,196	Magnetron research 50,000	Test equipment 213,215	Radio sondes 64,936	Accelerometer research 202,541	Voice communication research 104,721	Converter-repeaters 217,741				
<b>Air Materiel Command</b> Wright-Patterson AF Base, Ohio	Indicators 1,629,796	Intercoms 1,345,356	Generators 1,102,329	Direction finders 1,000,000	Radio compasses 56,595	Relays 188,713	Transmitters 1,245,755	Transmitter-receivers 962,480	Receivers 2,035,200					
<b>Remote flight controls</b>	1,029,470	<b>Amplifiers</b>	239,867	<b>Inverters</b>	333,103	<b>Alternators</b>	1,101,383	<b>Bur. of Aeronautics</b> Washington, D.C.	Transmitter-receivers 1,129,512	Indicator development 139,748	X-band beacons 32,208	Generators 949,800		
<b>Rome Air Force Depot</b> Rome, N.Y.	Transformers 31,031	Radar sets 199,591	<b>Electronic Supply Office</b> Great Lakes, Ill.	Tubes 1,860,875	Batteries 34,912	<b>U. S. Navy Purchasing Office</b> Los Angeles, Calif.	Recording oscillographs 54,703	<b>Naval Research Lab.</b> Washington, D.C.	Telemetering transmitters 58,750	<b>Bureau of Ordnance</b> Washington, D.C.	Servo motors 123,000	<b>Oklahoma City Air Materiel</b> Area, Tinker AF Base, Oklahoma City, Okla.	Rectifiers 35,685	Motor and generator sets 57,229
<b>Bur. of Ships</b> Washington, D.C.	Recorders 26,005	Circuit breakers 37,502	Power supplies 295,294	Antennas 52,445	Single-sideband radios 90,338	<b>Aviation Supply Office</b> Philadelphia, Pa.	Test sets 70,962	Coax switches 48,300	Servo units 31,303					

See also Caldwell-Clements Statistics in World Almanac, Encyclopaedia Britannica, National Conference Board Economic Almanac, and "Information Please" Almanac



# MEASUREMENTS CORPORATION

## Laboratory Standards

QUALITY ELECTRONIC  
MEASURING INSTRUMENTS  
FOR ACCURATE, DEPENDABLE SERVICE

**S**INCE 1939, MEASUREMENTS CORPORATION has developed and manufactured a precision line of Laboratory Standards designed for radio, television and other fields of the electronic industry. While our production departments are building instruments currently required by laboratories, manufacturers and the Armed Services, MEASUREMENTS' engineering division is engaged in extensive research on new equipment for the art.

Critical engineering control of all phases of manufacturing, from the selection of component parts, through the production departments, to the final mechanical and electrical inspection, assures every customer of quality instruments that are guaranteed to give accurate, dependable service.

**STANDARDS ARE ONLY AS  
RELIABLE AS THE REPUTATION  
OF THEIR MAKER**

### STANDARD SIGNAL GENERATORS

MODEL	FREQUENCY RANGE	OUTPUT RANGE	MODULATION
65-B	75 Kc.-30 Mc	0.1 microvolt to 2.2 volts	AM. 0 to 100% 400 cycles or 1000 cycles External mod., 50-10,000 cycles
78	15-25 Mc.; 195-225 Mc. 15-25 Mc.; 90-125 Mc. other ranges on order	1 to 100,000 microvolts	AM. 8200-400 cycles 625-400 cycles Fixed at approximately 30%
78-FM	86 Mc.-108 Mc.	1 to 100,000 microvolts	Deviation 0-300 kc, 2 ranges FM. 400-8200 cycles External modulation to 15 Kc.
80	2 Mc.-400 Mc.	0.1 to 100,000 microvolts	AM. 0 to 30% 400 cycles or 1000 cycles External mod., 50-10,000 cycles.
82	20 cycles to 200 Kc. 80 Kc. to 50 Mc.	0-50 volts 0.1 microvolt to 1 volt	Continuously variable 0-50% from 20 cycles to 20 Kc.
84	300 Mc.-1000 Mc.	0.1 to 100,000 microvolts	AM. 0 to 30%, 400, 1000, or 2500 cycles. Internal pulse modulator. External mod., 50-30,000 cycles.
84-TV	300 Mc. to 1000 Mc.	Continuously Variable from 0.1 Microvolt to 1.0 Volt	Continuously variable 0 to 30% External modulation 20 to 20,000 cycles.
90	20 Mc.-250 Mc.	0.3 microvolt to 0.1 volt	Continuously variable, 0 to 100% Sinusoidal modulation 30 cycles; 5 Mc. Composite TV modulation.

### PULSE GENERATOR

MODEL	FREQUENCY RANGE	PULSE WIDTH	OUTPUT
79-B	60 to 100,000 cycles	Continuously variable from 0.5 to 40 microseconds	Approximately 150 volts positive with respect to ground. "Sync Output" 75 volts positive with respect to ground.

### SQUARE WAVE GENERATOR

MODEL	FREQUENCY RANGE	WAVE SHAPE	OUTPUT
71	Continuously variable 6 to 100,000 cycles	Rise time less than 0.2 microseconds with negligible overshoot	Step attenuator: 75, 50, 25, 15, 10, 5 peak volts fixed and 0 to 2.5 volts continuously variable.

### U.H.F. RADIO NOISE and FIELD STRENGTH METER

MODEL	FREQUENCY RANGE	INPUT VOLTAGE RANGE
58	15 Mc. to 150 Mc.	1 to 100,000 microvolts in antenna. 1 to 100 microvolts on semi-logarithmic output meter, balanced resistance attenuator with ratios of 10, 100 and 1000 ahead of all tubes.

### VACUUM TUBE VOLTMETERS

MODEL	VOLTAGE RANGE	FREQUENCY RANGE	INPUT IMPEDANCE
62	0-1, 0-3, 0-30 and 0-100 volts AC or DC	30 cycles to over 150 Mc.	Approximately 7 mmfd.
62-U.H.F.	0-1, 0-3, 0-30 and 0-100 volts AC or DC	100 Kc to 500 Mc.	Approximately 2 mmfd.
67	0005 to 300 volts peak-to-peak	5 to 100,000 sine-wave cycles per second	1 megohm shunted by 30 mmfd.

### MEGACYCLE METER

MODEL	FREQUENCY RANGE	FREQUENCY ACCURACY	MODULATION
59	2.2 Mc. — 400 Mc.	Within $\pm 2\%$	CW or 120 cycles fixed at approximately 30%. Provision for external modulation

### CRYSTAL CALIBRATORS

MODEL	FREQUENCY RANGE	FREQUENCY ACCURACY	HARMONIC RANGE
111	250 Kc. — 1000 Mc.	0.001%	.25 Mc. Oscillator: .25-450 Mc. 1 Mc. Oscillator: 1-600 Mc. 10 Mc. Oscillator: 10-1000 Mc.
111-B	100 Kc. — 1000 Mc.	0.001%	.1 Mc. Oscillator: .1-450 Mc. 1 Mc. Oscillator: 1-600 Mc. 10 Mc. Oscillator: 10-1000 Mc.

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Catalog of Laboratory Standards

MEASUREMENTS CORPORATION • BOONTON, N. J.



# Germanium Transistors and Diodes

FOR EVERY PURPOSE!

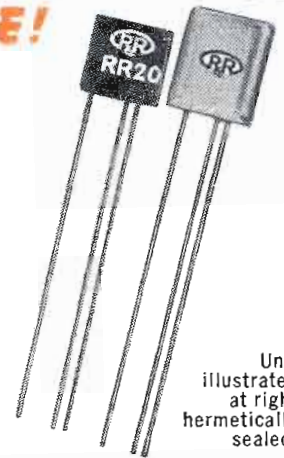
## PNP JUNCTION TRANSISTORS

PNP JUNCTION TRANSISTORS			
(Typical Characteristics at 25° C—Grounded Emitter)			
TYPE NO.	RR14‡	RR20‡	RR21‡
Collector Voltage—volts	-1.5	-1.5	-15.0
Collector Current—ma	-0.5	-0.5	-3.0
I <sub>co</sub> —Microamp.*	10	10	30
Current Amplification	25	40	25
Power Gain—db	30	40	—
Noise Factor—db (1 Kc)	22	22	—
Power out—mw (10% Dist.)†	—	—	20.0

\* I<sub>e</sub> = 0, V<sub>c</sub> = -1.5 volts.

† With 1000 ohm driving impedance and 5000 ohm load.

‡ RR14H, RR20H and RR21H are hermetically sealed types.

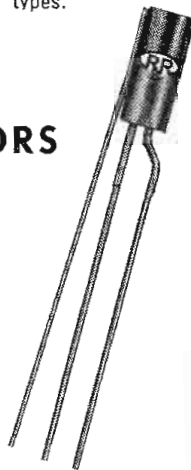


Unit illustrated at right hermetically sealed.

Tiny, stable high gain units, most economical of power, may be soldered in place or socketed in a recommended RTMA transistor socket. They are suitable for audio amplifiers, servo amplifiers and transformer coupled carrier amplifiers. Available in plastic or hermetically sealed in metal and glass.

## POINT CONTACT TRANSISTORS

Available in a variety of stable controlled types suitable for both fast and medium speed switching circuits and high frequency amplifiers. Advanced mechanical design for economical production . . . Heat conducting metal case; standard basing, choice of solder-in or plug-in.



POINT CONTACT TRANSISTORS		
Typical Characteristics at 25° C		
SWITCHING TRANSISTORS		
TYPE NO.	R1698	R1734
Off Collector Current max. ma (I <sub>e</sub> = 0)	-2.2 (@ V <sub>c</sub> = 40V)	-0.7 (@ V <sub>c</sub> = -7V)
On Collector Voltage max. volts (I <sub>c</sub> = 3.0)	-4.0 (@ I <sub>c</sub> = 5.5 ma)	-1.2 (@ I <sub>c</sub> = -4.0 ma)
Collector Dissipation max. m w	120	120
Nominal cut-off Frequency m c	1.5	10.0
GENERAL PURPOSE TRANSISTOR		
TYPE NO.	R1729	
Collector Voltage—volts	-30	
Emitter Current—ma	1.0	
Input Resistance (R <sub>11</sub> )—ohms	190	
Output Resistance (R <sub>22</sub> )—ohms	6000	
Current Amplification Factor	2.5	
Nominal Cut-off Frequency—mc	5.0	

Our engineers will be glad to offer suggestions regarding your Germanium Transistor and Diode applications without obligation . . . Write to Section T.

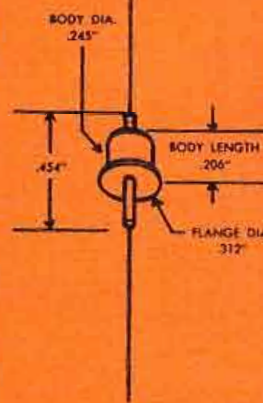


## JUNCTION POWER DIODES

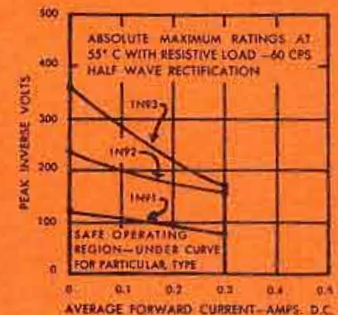
WITH THESE DISTINGUISHING CHARACTERISTICS:

- Very low forward drop • Low reverse leakage • Tiny • Hermetically sealed in metal and glass.

Useful in power supplies, magnetic amplifiers and telephone systems, etc., they have the characteristics of large plate-type power rectifiers and size and weight of a small circuit component.



SHOWN APPROXIMATELY ACTUAL SIZE



JUNCTION POWER DIODES			
Maximum Ratings at 55° C—Resistive Load			
TYPE NO.	1N91	1N92	1N93
Peak Inverse Voltage (volts)	100	200	300
Peak Forward Current (ma)	470	310	230
D.C. Output Current (ma)	150	100	75
Voltage Drop at Full Load (volts)	0.5	0.5	0.5
Surge Current (amps)	25	25	25
Reverse Working Voltage (continuous volts)	30	65	100
Max. Freq. of Operation (kc)	50	50	50

Coming . . .



## JUNCTION POWER TRANSISTORS

. . . For Audio power up to 2 watts



## PHOTO TRANSISTORS

. . . To operate power relay with one junction transistor as DC amplifier.

## SELETRON & GERMANIUM DIVISION RADIO RECEPTOR COMPANY, INC.

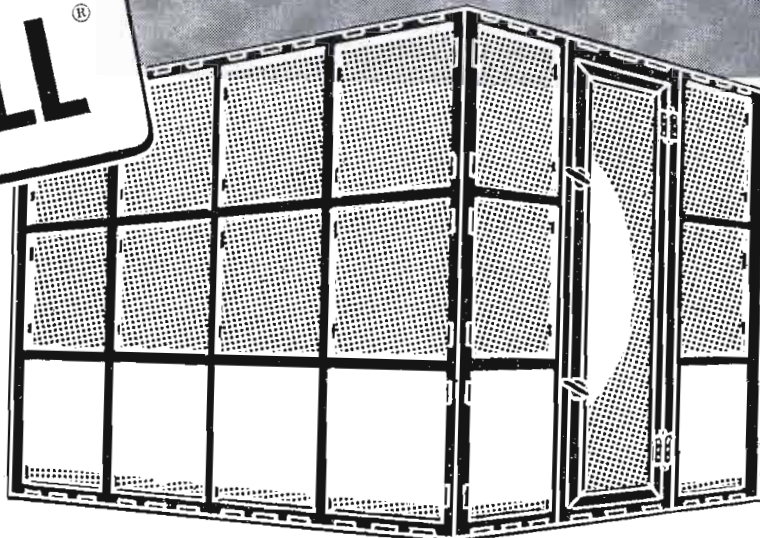
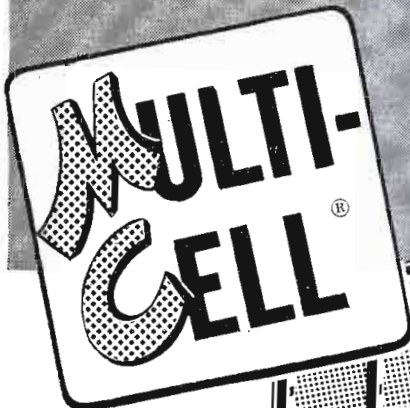


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Double shield, multiple cell type screen room

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Not only is our service exceptionally fast but our price will cut your expenses. We construct every type of enclosure: Solid or screen. Double shield, multiple cell. Double shield, isolated cell. Single shield. No obligation for engineering consultation.

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### CIRCULATION 21,000 C.C.A.

Because of the natural lag in auditing, never catching up with current circulation in an expanding industry, an audit for the calendar year 1953 will not be made until the summer of 1954. In the meantime, Caldwell-Clements, Inc. will furnish sworn statements and post office receipts for the current 21,000 circulation.

TELE-TECH\* & ELECTRONIC INDUSTRIES is edited for top-level engineers and executives throughout the electronic industries. It gives the busy engineering executive authoritative information and interpretation of the latest developments and new products, with emphasis on subjects of engineering import and timeliness. Special attention is given to:

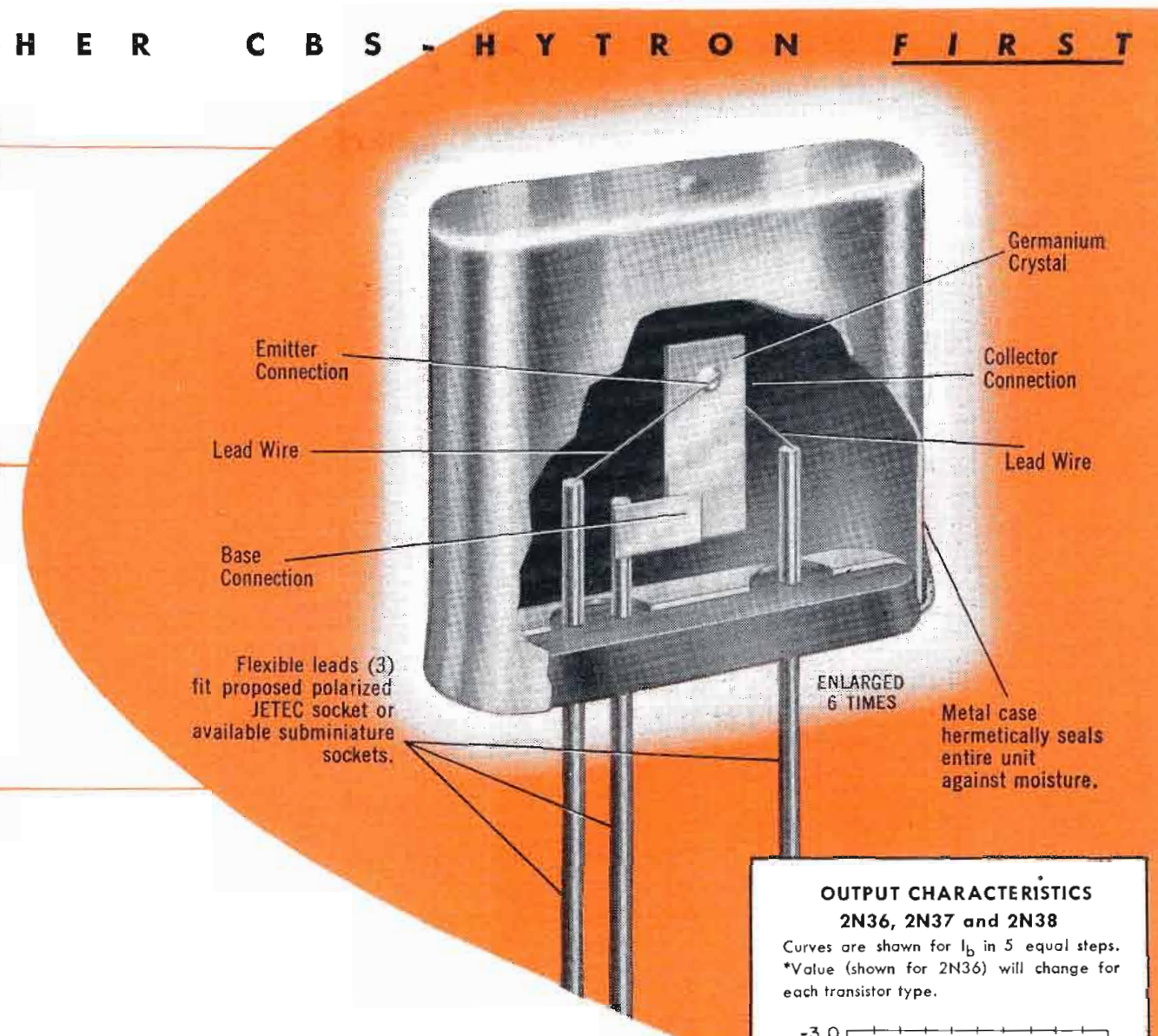
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- Electronic equipment, communications, broadcasting, microwave relay, instrumentation, telemetering, computing.
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- Fixed, mobile and airborne communications in commercial, municipal, aviation and government services.
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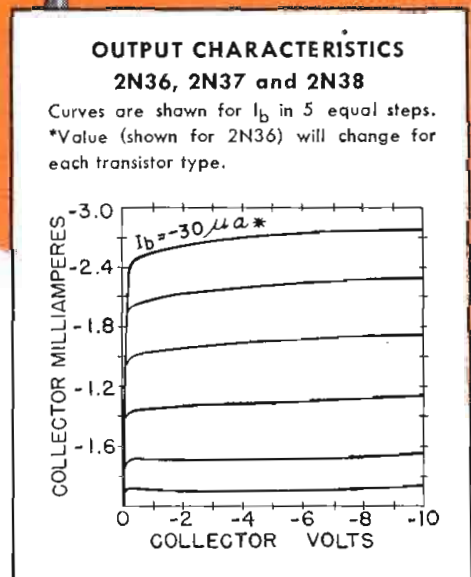
# NOW...HERMETICALLY SEALED CBS-HYTRON JUNCTION TRANSISTORS

In junction transistors, the surfaces are extremely sensitive to moisture. For dependability, they must be completely moisture-proofed. CBS-Hytron, recognizing this, is the first to offer you the new *hermetically sealed* 2N36, 2N37, and 2N38 junction transistors. Each is uniquely sealed in a metal case . . . moisture-proof, contamination-proof, light-proof. (See drawing.)

You can buy these new hermetically sealed P-N-P junction types immediately. All are amplifier types. Have similar characteristics, except for current amplification and power gain. You may operate the 2N36, 2N37, 2N38 up to 55°C. Their in-line design gives you: Compact, flat mounting . . . easily identified polarity . . . solder-in or plug-in (with clipped leads) convenience.

In addition to their unique moisture-proof feature, these CBS-Hytron junction types offer: (1) High gain. (2) Low noise figure. (3) Operation at low voltages. As well as other advantages characteristic of transistors: Compactness . . . light weight . . . ruggedness . . . instantaneous operation . . . and long life.

Remember, CBS-Hytron hermetically sealed 2N36, 2N37, 2N38 transistors are available at once. Write for complete data. Or order now for prompt delivery.



**ELECTRICAL CHARACTERISTICS †**  
CBS-Hytron P-N-P Junction Transistors

Characteristic	2N36	2N37	2N38	
Collector voltage	-6	-6	-6	v
Collector current	-1	-1	-1	ma.
Current amplification factor #	45	30	15	
Power gain #	40	36	32	db

†Typical values at 25°C. #Grounded emitter connection.



**NOW 3 CBS-HYTRON TEST ADAPTERS.** By popular demand. Three sizes now available at these net prices: 7-Pin Miniature, \$1.45; 8-Pin Octal, \$2.25; 9-Pin Miniature, \$1.75. Take advantage of e-a-s-y "topside" testing. Order your Test Adapters today from your CBS-Hytron jobber.

**CBS-HYTRON** Main Office: Danvers, Massachusetts

A Division of Columbia Broadcasting System, Inc.



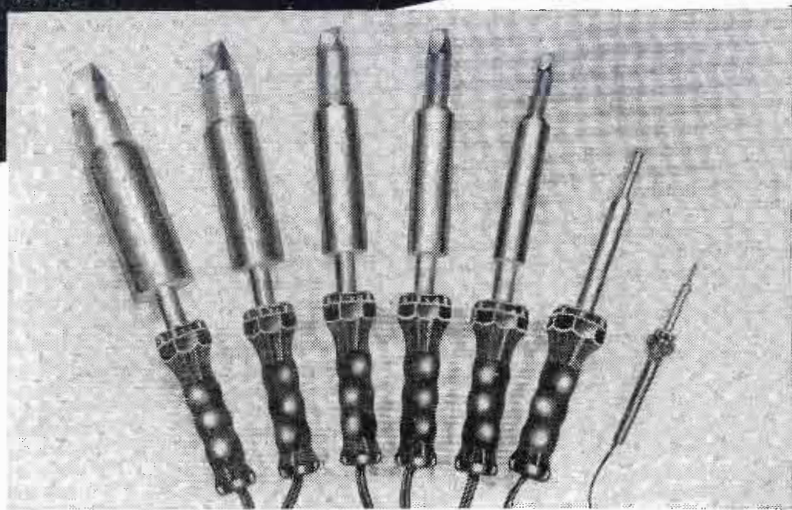
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**DID YOU KNOW:**—There are an estimated 26,793,000 TV receivers in use throughout the world?

There are 80,000 TV sets in Moscow and that the Soviet government is pushing wired TV for homes? That a deluxe set with a 9-in. screen costs \$600 in the USSR?

France will continue to broadcast its 441-line program until 1958 to prevent set obsolescence even though 819 lines is the present standard adopted?

The small island nation of Cuba has the fifth largest TV audience in the world with 120,000 receivers?

That for more details, you can read the complete round-up of TV statistics around the world, in this issue?

**LARGE COLOR TV TUBE** will be made available by Chromatic Labs. this summer. The Paramount Pictures subsidiary reports that they are tooling up for a 28-in. rectangular version of the Lawrence tube. Earlier demonstrations have shown a 22-in. color tube operating successfully on CBS and NTSC signals. For a detailed description, see the Feb. 1953 issue of TELE-TECH & ELECTRONIC INDUSTRIES, page 71.

**ATOMIC ENERGY:** Who pays? Who does the work? According to Dr. William L. Davidson, Director of the Office of Industrial Development of the AEC, over 90% of the cost of nuclear research and production has been paid by the U. S. Treasury. Interestingly enough, of the more than 150,000 people presently working on atomic energy projects, only 7,000 are direct employees of the AEC. More than 5000 companies are engaged or have been engaged in projects for the Commission. And so far as the necessary burden of security is concerned, almost 20% of the personnel working in the atomic program spend their full time carrying out security functions.

**ULTRA-ULTRA-FAST** camera developed at the U. of California's Los Alamos Scientific Lab can take 3,500,000 frames/second. The continuous-writing camera employs a rotating mirror to record self-luminous events.

(Continued on page 56)





**Type ML-6** **Range**  
 1.0 mc - 75.0 mc. supplied per mil Type  
 CR-18, CR-19, CR-23, CR-27, CR-28, CR-32,  
 CR-33, CR-35, CR-36, CR-48 when specified.  
 Hermetically sealed metal holder with glass  
 and metal base. Height of can is 3/4-inch.  
 Pins are .050" diameter, spaced .486".

**Type ML-14** **Range**  
 3.0 - 50.0 mc. Identical in  
 performance to Type ML-6  
 except height of metal can  
 is 1/2-inch.

**Type ML-6A**  
 Identical to Type ML-6 ex-  
 cept provided with .093" di-  
 ameter pins.

**Type ML-6W** **Range**  
 3.0 - 15.0 mc. This unit is  
 same as Type ML-6 except  
 wire leads are provided,  
 eliminating need for crystal  
 socket.

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The quality of Midland Crystals — which is another way of saying the completely dependable job they will do for you — is assured by exacting tests and controls through every step of processing. The finest precision equipment and most advanced techniques known to the industry are used by Midland from selection of raw quartz to final sealing of the crystal.

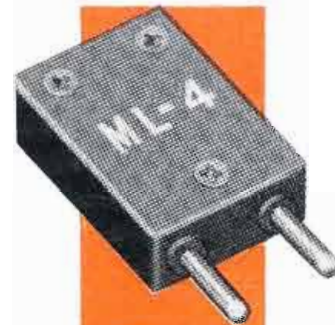
That's a big reason why Midland has climbed to its present position as the world's largest producer of quartz crystals for use in 2-way communications and other electronic devices.

Midland's engineering staff is ready to help in any project involving the use of crystals.

*Whatever your Crystal need, conventional or specialized  
 When it has to be exactly right, contact*



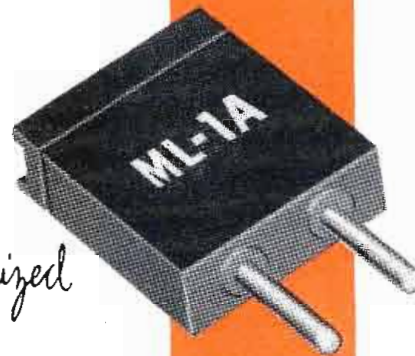
**MANUFACTURING CO., INC.**  
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**Type ML-4** **Range**  
 1.0 - 10.0 mc. Sup-  
 plied per mil Type  
 CR-5, CR-6, CR-8, CR-  
 10 when specified.  
 Holder is phenolic,  
 gasket sealed. Holder  
 size is 1 1/8 x 1 3/8 x 7/8  
 with .093" diameter  
 pins 1/2" long spaced  
 .486".



**Type ML-13**  
 Units of this type are  
 currently undergoing  
 tests on experimental  
 basis. The unit is her-  
 metically sealed. Pin  
 dimensions are the  
 same as our Type ML-  
 6. Height of can is  
 1 1/2-inch.



**Type ML-1A** **Range**  
 2.0 - 15.0 mc. Sup-  
 plied per mil Type  
 CR-1A when specified.  
 Holder is phenolic,  
 gasket sealed. Holder  
 size is 1 1/4" x 1 1/8" x  
 27/64" with .125" di-  
 ameter pins 5/8" long,  
 spaced at .500".



**Type ML-10** **Range**  
 15.0 - 50.0 mc. Sup-  
 plied per mil Type  
 CR-24 when specified.  
 Over-all length is  
 1.055". Pin contacts,  
 .062" diameter.

WORLD'S LARGEST PRODUCER OF QUARTZ CRYSTALS

# KLEIN

## Quality Pliers

SPECIALLY DESIGNED

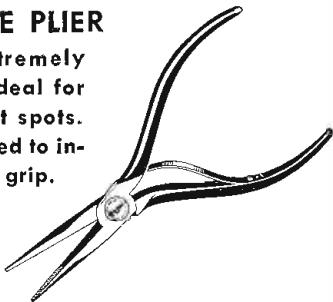
### FOR THE ELECTRONICS INDUSTRY

Now, Klein quality pliers are available in new compact patterns for precision wiring and cutting in confined space. Note, too, the replaceable leaf spring that keeps the plier in open position,

ready for work. All are hammer forged from high-grade tool steel, individually fitted, tempered, adjusted and tested—made by plier specialists with a reputation for quality “since 1857.”

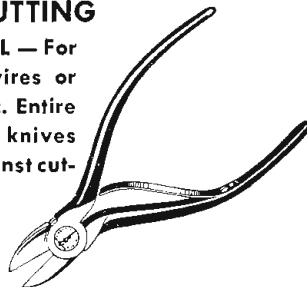
#### LONG NOSE PLIER

307-5-1/2L—Extremely slim pattern ideal for the really tight spots. Jaws are knurled to insure a positive grip.



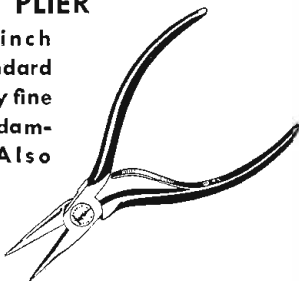
#### OBLIQUE CUTTING PLIER — 210-5L —

For cutting small wires or trimming plastic. Entire length of cutting knives works flush against cutting surface. 5 or 6-inch sizes.



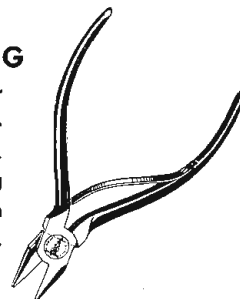
#### CHAIN NOSE PLIER

317-5L—A full inch smaller than standard pattern. Has a very fine knurl that will not damage soft wire. Also available without knurl.



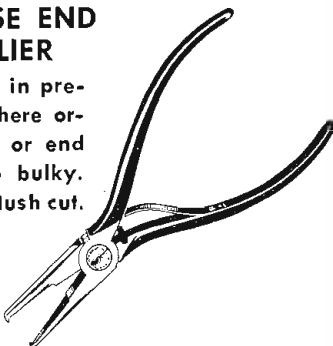
#### LIGHTWEIGHT OBLIQUE CUTTING PLIER 209-5—

Smaller than 210-5L with an extremely narrow head. Entire length of cutting knives works flush against cutting surface.



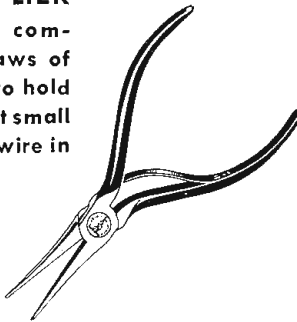
#### TRANSVERSE END CUTTING PLIER

204-6—Useful in precision work where ordinary oblique or end cutters are too bulky. Gives a clean, flush cut.



#### DUCK BILL PLIER

306-5-1/2—This compact plier has jaws of sufficient width to hold small springs, yet small enough to form wire in confined places.



This Klein Pocket Tool Guide gives full information on all types and sizes of Klein Pliers. A copy will be sent without obligation.



#### ASK YOUR SUPPLIER

Foreign Distributor:  
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"Since 1857"



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Established 1857

Chicago, Ill., U.S.A.

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### TELE-TIPS

(Continued from page 48)

28,000 channel-miles of coaxial-cable and microwave-relay lines are now in use by the Bell System. Of this, 16,000 channel-miles are microwave; 12,000 channel-miles are coaxial cable. Television stations' own links probably account for another 3000 miles.

**UNDERWATER "FARM"**—A request for two-way radio communications to assist in the management of a 7000-acre farm in the Long Island Sound area just south of New Haven, Conn., is puzzling the FCC because the "farm" lies at the bottom of the Long Island Sound and the crop is oysters. The owners have applied for three base transmitting stations at Madison and South Norwalk, Conn., and Greenport, N. Y., and 50 mobile units to operate on 30.62 megacycles. The system, for which Motorola equipment has been proposed, will cost an estimated \$28,000. It would be used to oversee the planting of a half million bushels of oyster shells each summer on underwater beds and in shifting the oysters from bed to bed as they grow.

**CRASH LOCATER**—which pinpoints the spot at which a plane crashes, will permit rescue teams to fly directly to the scene of the crash without search for missing craft. Developed by the U. S. Air Rescue Service of the Air Force, the "crash beacon locator," as it is called, is carried near the tail of the plane. It can be released manually by the pilot if he has time and, if not, the beacon ejects itself when the plane strikes the ground or body of water. Through electronic circuits, it "decides" when it has come to final rest, turns itself upright, extends antenna and begins sending distress messages. Instead of the usual SOS, the beacon sends the serial number of the plane and a code letter representing the time elapsed since the plane crashed. From the serial number, rescue squads can determine what plane crashed, how many persons aboard and what type of rescue aid is needed. This vital information is received at several remote direction-finding stations which feed the information into a central station. There the operator can spot on the map almost exactly where the plane crashed. The beacon is encased in a cylinder five inches in diameter and two feet long, and the electronic parts are protected to withstand extreme shocks. The crash beacon lo-

(Continued on page 60)

# SMOOTH ACTION

## **NEW** *Houston-Fearless* **TV** **CAMERA** **PEDESTAL**



Camera is raised quickly, easily by lifting on steering wheel.

**N**ew smooth action...new stability...new convenience and ease of operation are offered in the new Houston-Fearless Television Camera Pedestal, Model PD-3. Camera is accurately counter-balanced, making it possible to raise and lower quickly, smoothly by simply lifting or pressing on steering wheel, even with pedestal in motion. Three pairs of dual-wheels assure smoother rolling-dolly shots. Two types of steering: for straight tracking or sharp turning. All controls are within easy reach of cameraman for maximum convenience. Dependable Houston-Fearless quality throughout. Makes possible better, more showmanlike productions in any studio. Write for details today.

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# EBY CROSSOVER NETWORK

**combines UHF and VHF**

**Into a Single Antenna System**

The EBY CROSSOVER NETWORK is a device designed for insertion between the UHF and VHF antennas in such a manner as to minimize interference and signal losses. The insertion loss of this device over both the 54 to 216 MC, VHF range, and the 470 to 890 MC, UHF range, is approximately 1 db which is much less than losses obtained using dual transmission lines and a UHF switching unit.

**The EBY CROSSOVER NETWORK has been thoroughly field tested and gives superior performance.**

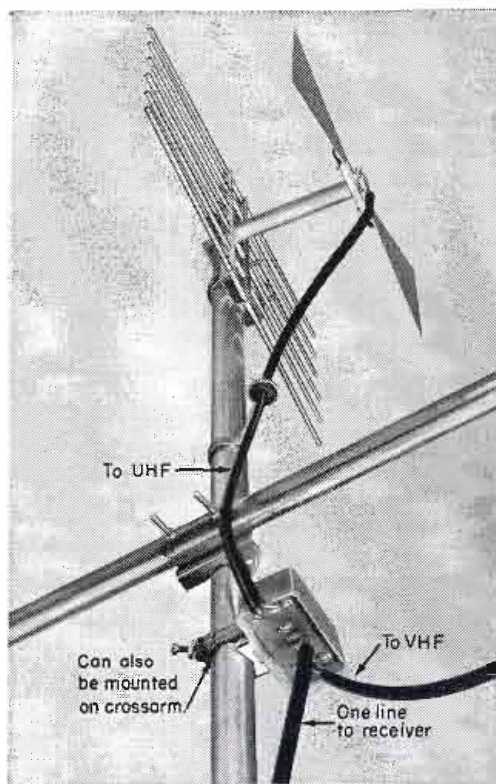
**The EBY CROSSOVER NETWORK is in production.**

*Samples and further information on request.*

**WRITE TODAY TO:**

**HUGH H. EBY INC.**

4704 Stenton Avenue • Philadelphia 44, Pa.



## TELE-TIPS

(Continued from page 56)

cator will work automatically on land or water for 48 hours without attention.

**CONFUSION** about new TV developments still reigns among large segments of the public, as well as several people who should know better. Recent example—illustrating the need for more popular education on the subject—came up at a color TV showing to an official group studying same. Up popped one observer—"Is this what you call UHF?"

**NEW CANCER** hospital has been opened on the U. of Chicago campus at a cost of \$4,200,000, provided by the AEC. It will house all known radiation sources for the study and treatment of cancer. Among the many devices being installed are a 2000 kv Van de Graaff generator, a cobalt-60 "bomb" to provide a source of X-rays which can be rotated around the patient, and a linear accelerator which steps up electron beam energies to 50,000 kv, sufficient to pass through the body.

**GOVERNMENT FUNDS** for research cover a wide range of percent-of-total research expenditures in various industries. Highest on the list is aircraft, 85% coming from defense contracts; electronic industries figure is 60%; chemicals obtain 7% of their research funds from the Government; and petroleum refining is down to 3%.

**TV HELPED**—A decade ago the annual residential bill for electricity averaged \$36.78 (for 986 kilowatt-hours). This was about 2.39% of the average industrial wage. Last year the electric bill was \$56.31 (for 2,004 kilowatt-hours—twice as many kilowatt-hours) but this bill was only 1.67% of the average wage.

**HYDROCAPS** are a new development that greatly increases car battery life. Hydrocaps contain a catalyst which converts escaping hydrogen and oxygen gases back into water. Besides keeping water in the battery at a safe level eight times longer, the new caps prevent corrosion by capturing the sulphuric acid fumes present and washing them back into the battery. They also give warning of overcharge. Hydrocaps normally operate warm to the touch, becoming hot (around 200 degrees) when the car's voltage regulator needs adjusting.

(Continued on page 66)



# Here's up-to-the-minute data on 14 Centralab components

## Electronic Engineers...write for these 14 new pictorial technical bulletins on important Centralab electronic developments

If you're one of the thousands of electronic engineers specifying Centralab electronic components — here's a quick way of bringing your file up-to-date. These 14 new bulletins . . . just off the press . . . are immediately available. Each contains essential, exact specifications for radio TV, UHF and VHF applications.

### PRINTED ELECTRONIC CIRCUITS

1. **AUDET**, PC-150 & PC-151. Centralab's audio detector plate for a-c, d-c receiver output stages. Bulletin 42-129.
2. **PENDET**, PC-160. Remarkably small PEC consisting of 4 resistors and 5 capacitors requiring only 9 connections, instead of the usual 18. Bulletin 42-149.
3. **MODEL 2 AMPEC**, PC-200 & PC-201. A three-stage speech amplifier smaller than the cover of ordinary book matches. Bulletin 42-117R.
4. **MODEL 3 AMPEC**, PC-202 & PC-204. Postage-

stamp size three-stage speech amplifier for sub-miniatures. Bulletin 42-130R.

5. **PENTRODE COUPLATES**, PC-90 & PC-91. Even smaller than before. A complete pentode inter-stage coupling circuit. Bulletin 42-128R.

6. **TRIODE COUPLATES**, PC-70, PC-71, PC-80, PC-81, for inter-stage audio coupling circuits. New space-saving design. Bulletin 42-127R.

7. **SMALL PLATE COMPONENTS**. Tiny resistor-capacitor combinations. Seven plates, including famous "Filpec," fit scores of miniature applications. Bulletin 42-132.

### VARIABLE RESISTORS

8. **MODEL 1 RADIOHMS (R)**. Smallest variable resistor on the market (only 3/8" dia.). Includes data on new Hi-Torque model. Bulletin 42-158.

9. **MODEL 2 EXPRESS RADIOHM**. Quick-delivery, switch-type variable resistor. Shafts staked directly to radiohm on your order. Bulletin 42-163.

### CAPACITORS

10. **TYPE 950 HIGH-ACCURACY**. For exacting electronic applications in r.f. circuits. Bulletin 42-123.

11. **BUTTON-TYPE CERAMIC CAPACITORS**. Five different types, solder-sealed for HF, UHF, VHF applications. Bulletin 42-122R.

12. **STAND-OFF**. Designed especially for by-passing r.f. circuits to ground in low-power applications. Bulletin 42-121R.

13. **TRANSMITTING**. For transmitters, other high-voltage portable gear. Extremely compact and rugged. Bulletin 42-102R.

14. **BC TUBULARS**. New data on dependable BC-HI-KAPS, long preferred for by-pass coupling. Bulletin 42-3R.

You can depend on Centralab electronic components to maintain the high perfection and performance expected of modern electronic gear. By having full information at your fingertips, you can be sure of keeping abreast of the fast-changing electronics field. For your convenience, we've included a handy coupon.

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 42-158  42-163  42-123  42-122R  42-102R  42-121R  42-3R

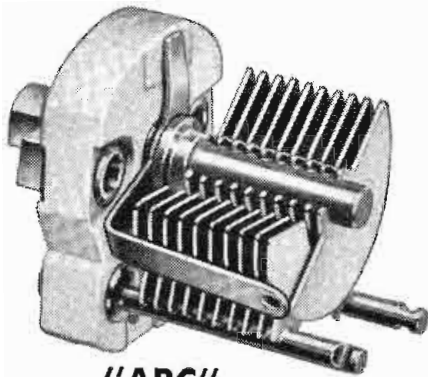
Name.....

Company.....

Title.....

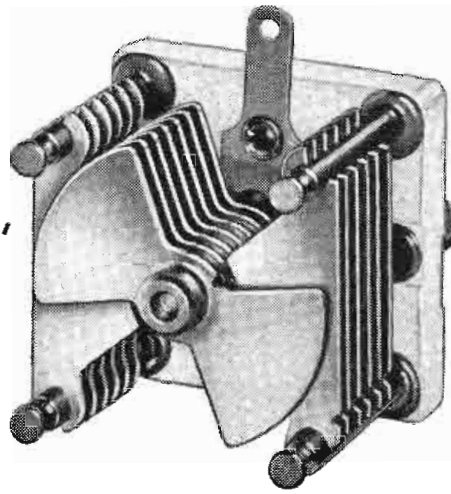
Address.....

City..... Zone..... State.....



"APC"

"BFC"



*When design considerations  
are critical—Put in  
HAMMARLUND CAPACITORS*

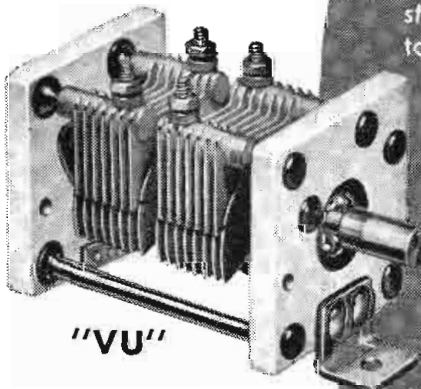
Consider these facts about Hammarlund Capacitors when selecting components for your electronic equipment:

- Plates are of brass, and soldered, *not staked*, to their supports to insure perfect contact and prevent loosening.
- Precision soldering fixtures and assembly jigs used during fabrication assure uniformity of plate spacing.
- Rotor and stator assemblies are nickel-plated to minimize corrosion.
- Rotor contact springs are beryllium copper or phosphor bronze, and nickel or silver plated, for positive contact.

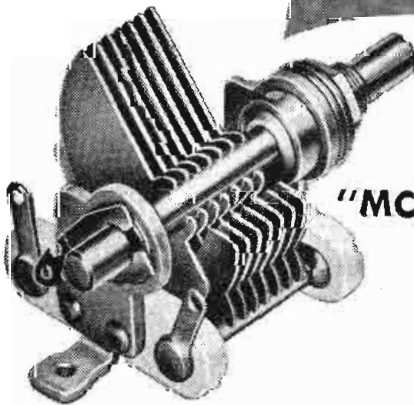
These are some of the features that make Hammarlund Capacitors your best choice for use in quality electronic equipment.

**HAMMARLUND**

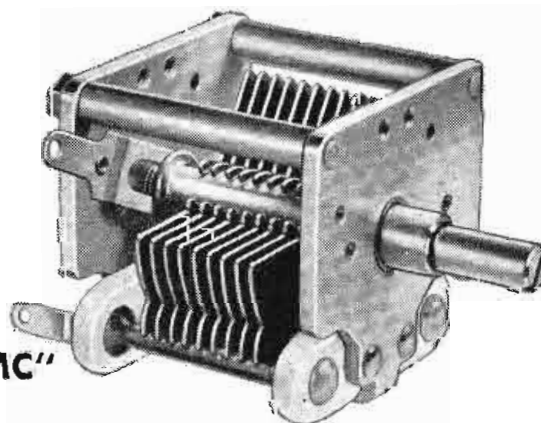
HAMMARLUND MANUFACTURING CO., INC.  
460 WEST 34th ST. • NEW YORK 1, N. Y.



"VU"



"MC"



"RMC"

**TELE-TIPS**

(Continued from page 60)

**LIGHTNING PROTECTION—**

With summer storms ahead and radio-TV-antennas among the chief lightning hazards, the National Bureau of Standards has just issued a new edition of *Code for Protection Against Lightning*, (NBS 46) sponsored jointly by the National Fire Protection Association, American Institute of Electrical Engineers, and the Bureau. This 91-page book, price 40 cents, may be ordered from Government Printing Office, Washington 25, D. C.

**GOLD FINISH—**

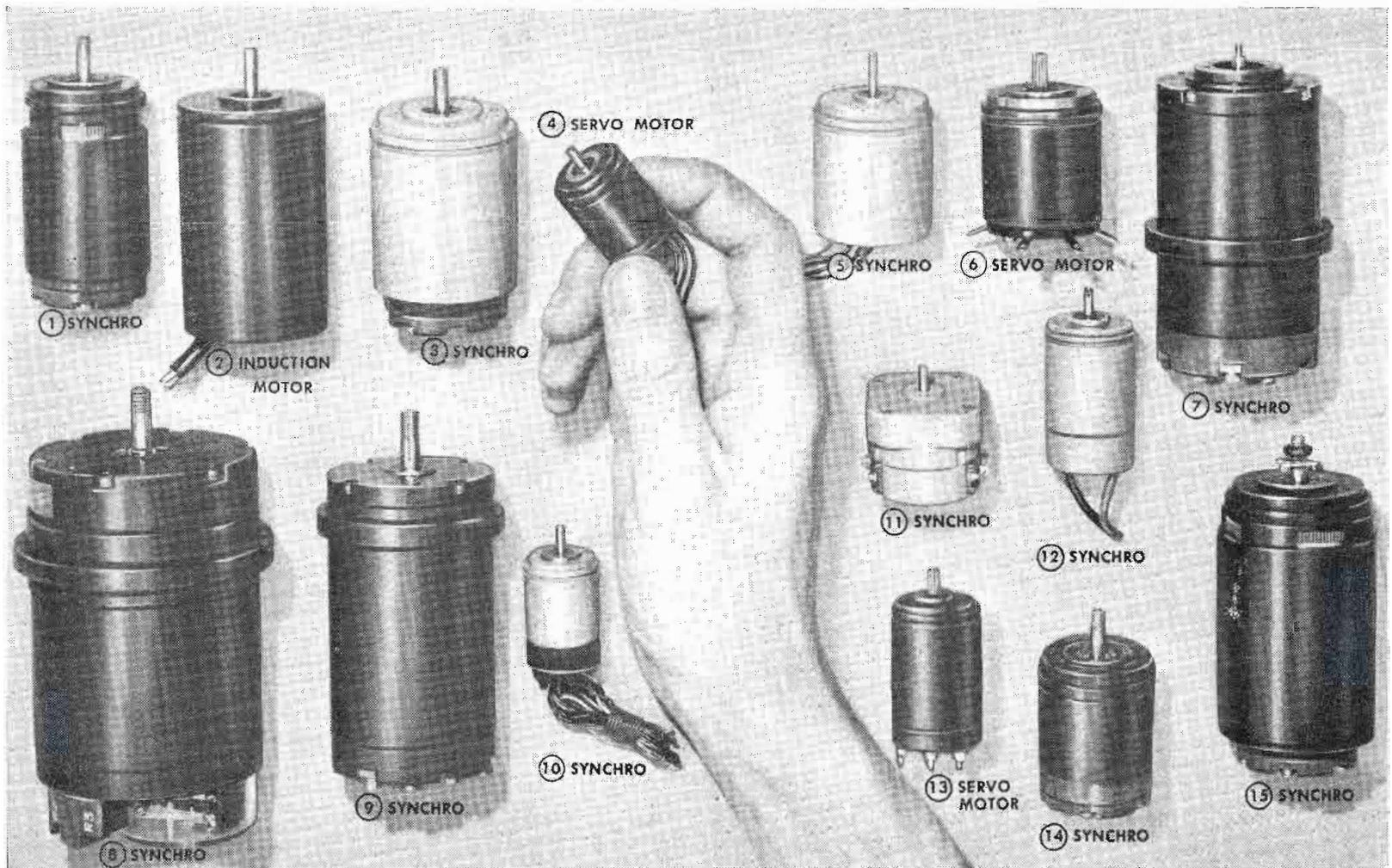
D'orium, licensed to Miracle Finishes, Inc., (10 Water St., Brooklyn 1, N. Y.) exclusively in the United States by Coloral, S. A. of Switzerland, gives aluminum a gold finish which is so realistic that it is almost impossible to detect the difference by eye alone between it and genuine gold. Six shades of gold can be achieved, as well as many other colors, all of which have a high lustre and are non-corrosive. The finish is promised not to tarnish or discolor, and since it is an integral part of the metal, it can't chip, peel or crack. No gold is used.

**3-D MOVIES—**

It takes a crisis to make Hollywood alter its ways. Sound-pictures were old before Al Jolson saved the day with them in 1927, when broadcasting was sweeping all before it. Cinerama, Cinemascope, stereoscopic movies—these too, are old in principle. Cinerama is an outgrowth of Raoul Grimoin Sanson's black-and-white Cineorama, which created a sensation at the Paris International Exposition of 1900.

Cinemascope made a deep impression in 1930 under the name Anamorphoscope. All the 3-D systems in which Hollywood is displaying a belated interest have a history that goes back to the days of still photography when there were no movies at all and when every home had a stereoscope and a collection of stereo photographs. Three-dimensional pictures, as Hollywood loosely uses the term, are of two kinds. One depends on engulfing the spectator in the scene, just as he is engulfed out of doors when he looks at a landscape; the other depends on the fact that we have binocular vision. Cinerama and Cinemascope are engulfers. All the other 3-D systems are stereoscopic. — Waldemar Kaempffert — in the *New York Times*

**OPPORTUNITY—**He who seizes the right moment is the right man.—Goethe.



# *Ketay* gives you a complete variety of sizes and types of Synchros and Servo Motors

## WHATEVER THE NEED CHOOSE KETAY! Available as listed

1. SYNCHRO, Size 16, O.D. 1.537", 115 V, 400 Cycles  
(Transmitter, Receiver, Control Transformer)
2. INDUCTION MOTOR, O.D. 1.750", 3 phase 2 Pole, 115 V, 60 Cycles
3. SYNCHRO, Size 18, O.D. 1.750", 115 V, 400 and 60 Cycles  
(Transmitter, Receiver, Differential, Control Transformer)
4. SERVO MOTOR, O.D. .937", 26V, 400 Cycles
5. SYNCHRO, O.D. 1.437", 14.4 V and 26 V, 400 Cycles  
(Transmitter, Receiver, Resolver, Differential, Control Transformer)
6. SERVO MOTOR Mk 7, O.D. 1.437", 115 V, 400 Cycles
7. SYNCHRO, Type 1F or 1HG, O.D. 2.250" 115 V, 60 Cycles  
(Receiver, Transmitter)
8. SYNCHRO, Size 31, O.D. 3.10", 115 V 400 and 60 Cycles  
(Transmitter, Receiver, Differential, Control Transformer)
9. SYNCHRO, Size 23, O.D. 2.250", 26 V and 115 V 400 & 60 Cycles  
(Transmitter, Receiver, Resolver, Differential, Control Transformer)
10. SYNCHRO, O.D. .937", 26 V, 400 Cycles  
(Transmitter, Receiver, Resolver, Differential, Control Transformer)
11. LINEAR TYPE CONTROL TRANSFORMER, O.D. 1.625", 26 V, 400 Cycles
12. SYNCHRO, Size 11, O.D. 1.062", 26 V and 115 V, 400 Cycles  
(Transmitter, Receiver, Resolver, Differential, Control Transformer)
13. SERVO MOTOR, O.D. 1.062", 115 V, 400 Cycles
14. SYNCHRO, Size 15, O.D. 1.437", 26 V and 115 V, 400 Cycles  
(Transmitter, Receiver, Resolver, Differential, Control Transformer)
15. SYNCHRO, Size 19, O.D. 1.90", 115 V, 400 Cycles  
(Transmitter, Receiver, Control Transformer)

KETAY offers high precision rotary and instrument components for most every need in the Armed Forces and Industry. As the world's largest producer of government approved synchros; Ketay stands ready to solve your problems with a complete line of synchros, servos, magnetic amplifiers, computers and control systems.

If you are searching for a specific size or type... if availability is a problem... if engineering counsel is needed... Ketay can help. Why not join us for an exploratory discussion of your particular problem. Write today to Dept. B

*Ketay* **MANUFACTURING CORP.**  
555 Broadway, New York 12, N. Y.

KINETIX INSTRUMENT DIV.

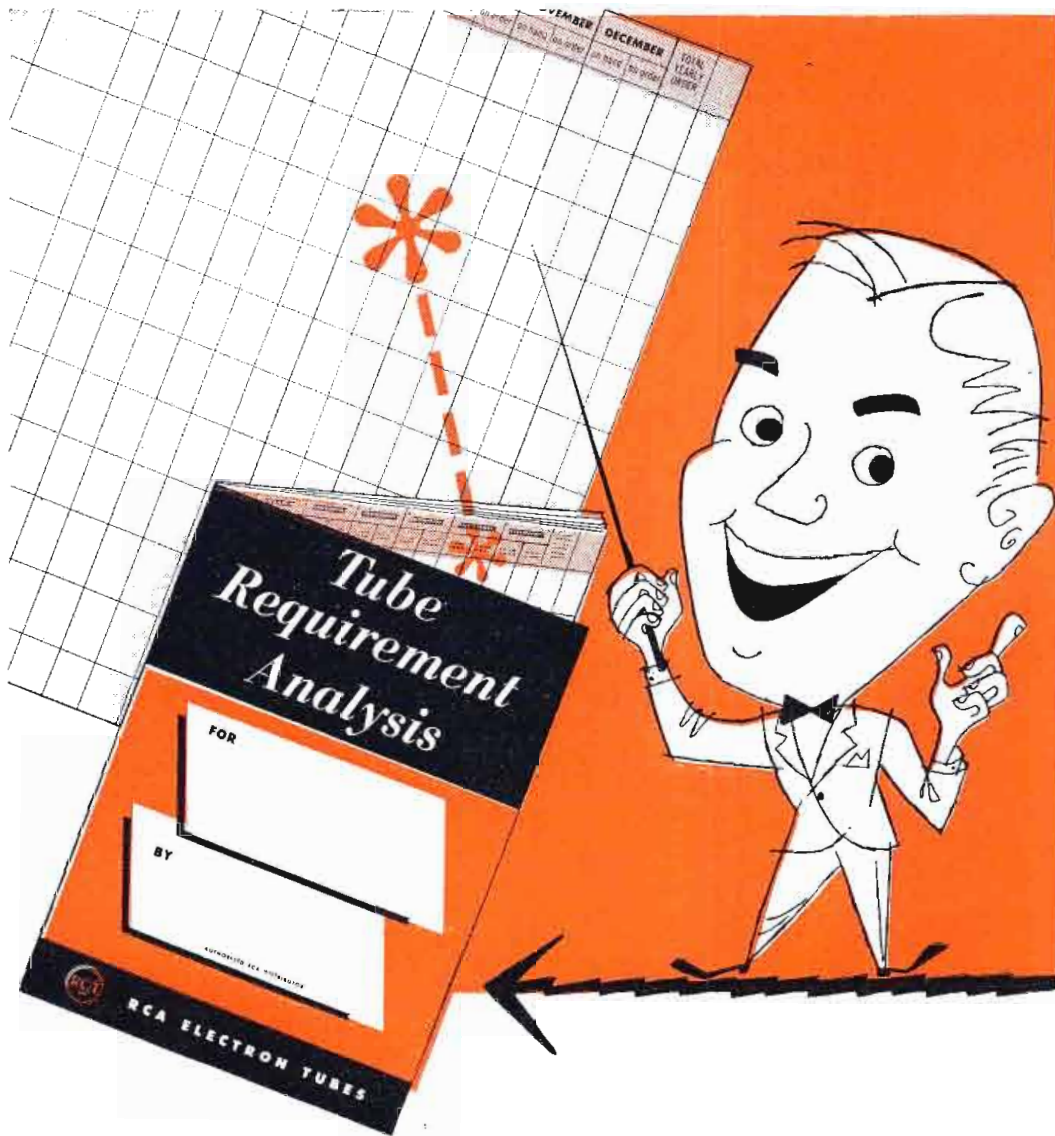
RESEARCH & DEVELOPMENT DIV.

PACIFIC DIVISION  
12833 Simms Ave., Hawthorne, Calif.

**DESIGN**

**DEVELOPMENT**

**MANUFACTURE** ...of precision instruments, components, and systems.



## Fingertip control of your broadcast tube inventory



HERE'S A PROGRAM that places vital ordering and inventory information right at your fingertips. With just one glance you can quickly estimate the status of your reserve tube stock.

**Here's all you have to do . . .**

Get in touch with your RCA Tube Distributor. Tell him you would like to take advantage of the free RCA Tube Requirement Analysis Program.

Your RCA Tube Distributor will survey your station equipment, analyze your tube requirements, and prepare a suggested inventory control system for your spare tube stock . . . tailored specifically to your equipment and your operation. There is no charge or obligation for this service.

**RESULT:** No shortages. No "overstocks." Your spare tube inventory will be in correct balance at all times.

**RCA's new Tube Requirement Analysis is available exclusively through your local RCA Tube Distributor. Call or write him today. No charge or obligation.**

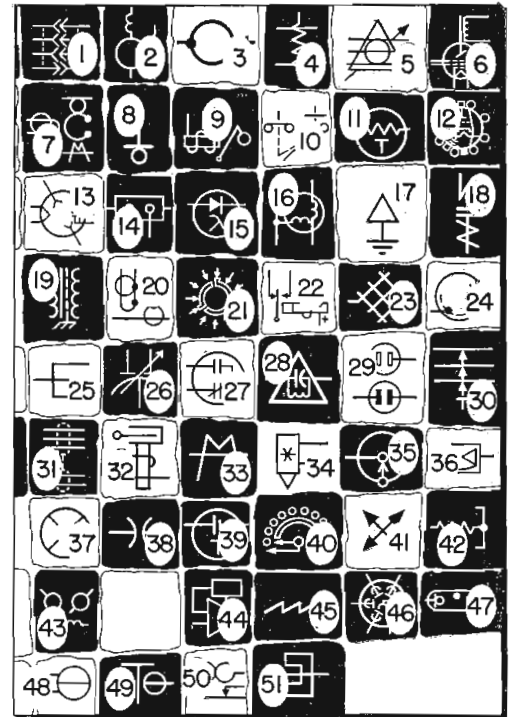


**RADIO CORPORATION of AMERICA**  
ELECTRON TUBES  
HARRISON, N. J.

## FRONT COVER

### New Symbols

New graphical symbols for electrical diagrams provide an excellent engineering shorthand, as well as a strikingly artistic cover. They include two types: Single line diagrams are intended to show essential components and functions in simplified form; Complete dia-



grams indicate the complete circuit or system of circuits and the component devices used therein. A given device may therefore be represented by two different symbols. In some cases, only a Single or Complete symbol is available for a particular component, but not both. In other cases, one symbol serves for both Single and Complete.

Listed below are the explanations of the symbols appearing on the front cover. They are numbered to correspond with the numbers on the accompanying subminiature version of the cover. The letters in parentheses indicate Single (S) or Complete (C) symbols.

1: (C) Four-conductor connector, shown engaged, has one male and three female contacts.

2: (C) Separately excited dc generator or motor with commutating and/or compensating field winding.

3: (S or C) Rotating slip-ring contact and brush.

4: (C) Balanced path.

5: (C) Adjustable phase shifter for 3-wire or 3-phase.

6: (S or C) X-ray tube with multiple accelerating electrode, electrostatically and electromagnetically focused.

7: (S or C) Resonator coupled by aperture to a guided transmission path and by a loop to a coaxial, with mode suppression.

8: (S or C) Composite anode—cold cathode.

9: (C) Electromagnetically operated counter with make contact.

10: (S or C) Two-circuit pushbutton maintained or non-spring return switch.

11: (C) Thermistor.



12: (S or C) Disc-seal UHF triode with internal capacitor.

13: (S or C) Transit-time split-plate magnetron with stabilizing deflecting electrodes and internal circuit.

14: (C) Instrument or relay shunt.

15: (S or C) Asymmetrical photo-conductive resistive transducer.

16: (C) One-phase induction voltage regulator.

17: (S) Transformer winding connection, 3-phase, 4-wire delta, grounded.

18: (C) Electrically operated single-pole contactor with series blowout coil.

19: (S or C) Transformer with magnetic core, with shield between windings connected to frame.

20: (S or C) Coupling by loop from coaxial to circular waveguide with dc grounds connected.

21: (S or C) Wafer switch, 3-pole, 3-circuit, with two non-shortening and one shortening moving contacts.

22: (C) Polarized relay with transfer contacts.

23: (S) Low-voltage power network.

24: (S or C) Shield within envelope connected to independent terminal.

25: (S or C) Antenna counterpoise.

26: (C) Continuously variable differential capacitor.

27: (S or C) Switch in evacuated envelope, one-pole, double throw.

28: (S or C) LC circuit with infinite reactance at resonance.

29: (C) Non-polarized female (top) and male contacts, two-conductor.

30: (C) Triple conductors, twisted.

31: (C) Shielded 5-conductor cable, with conductors separated for convenience.

32: (C) Sounder telegraph.

33: (S or C) Mode suppression in coaxial and waveguide transmission.

34: (C) Mechanical-electric pickup.

35: (C) Speed regulator, contact closed.

36: (S or C) 2-wire, 2-way repeater with low frequency bypass.

37: (S or C) Multicavity magnetron anode and envelope.

38: (S or C) Sphere gap.

39: (C) Temperature - measuring semiconductor thermocouple.

40: (S or C) 10-point selector switch with fixed segment.

41: (S or C) Directional coupler, arrows indicate direction of power flow.

42: (S or C) Series terminating resistor and path shorted.

43: (C) Dynamotor.

44: (S) Amplifier with external feedback path.

45: (S or C) Air or space path.

46: (S or C) Multiplier type phototube.

47: (C) 2-terminal, cold cathode fluorescent lamp.

48: (C) One-phase hysteresis motor.

49: (S or C) Transducer from rectangular to circular waveguide.

50: (C) Thermostat with break contact.

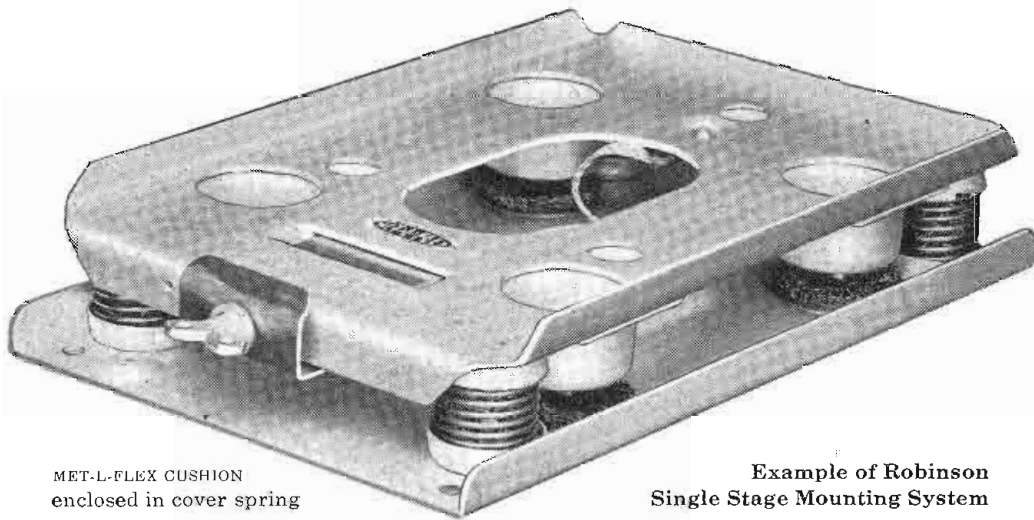
51: (S or C) Ridged waveguide.

Note: Two additional symbols have been added to the ELECTRONIC INDUSTRIES DIRECTORY cover on page 195. These are at the lower right corner, and represent (l) rotor-excited synchro, and (r) simple telegraph key with shorting switch.



## Robinson Vibration and Shock Control Mounts

### SET NEW RECORDS of DURABILITY...



MET-L-FLEX CUSHION  
enclosed in cover spring

Example of Robinson  
Single Stage Mounting System

Robinson Engineered Mounting Systems and Unit Mounts are the most durable ever built. They employ an all-steel, load-carrying cushion, Met-L-Flex\*, which is fabricated in such a way that all wires are continuous from top to bottom. These cushions are inherently and permanently damped. They do not require external damping devices.

Met-L-Flex cushions properly installed in Robinson Systems do not and cannot permanently set or pack. They are correct in theory, durable in practice.

#### Long Service Record

AMERICAN AIRLINES, INC., has used Robinson Mounts and Mounting Systems for three years in its *Flagship Fleet*, and reports that not one replacement has been required during

this period. This represents a service life nine times as great as mounts previously used.

Robinson Mounts are designed and built for the operating life of the aircraft and the equipment on which they are used. Their long life and durability result in important savings of time and money for replacements.

#### Proven in Experience

Specified and used by hundreds of leading electronics, aircraft and industrial manufacturers, Robinson Mounting Systems offer a proven solution to today's problems of vibration and shock.

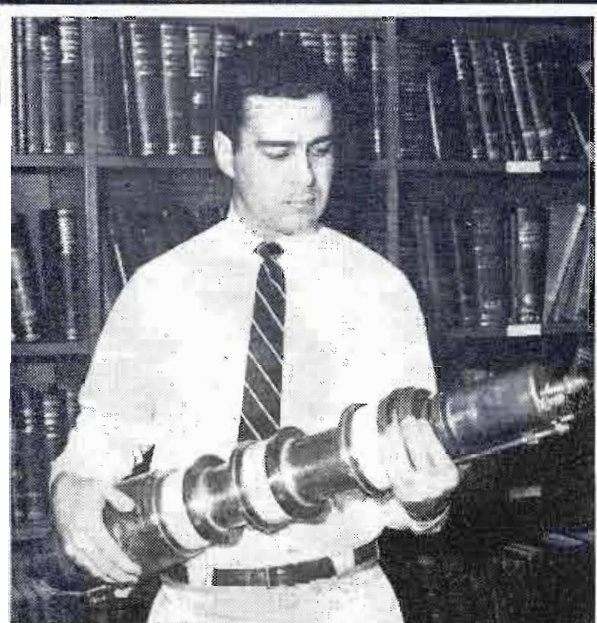
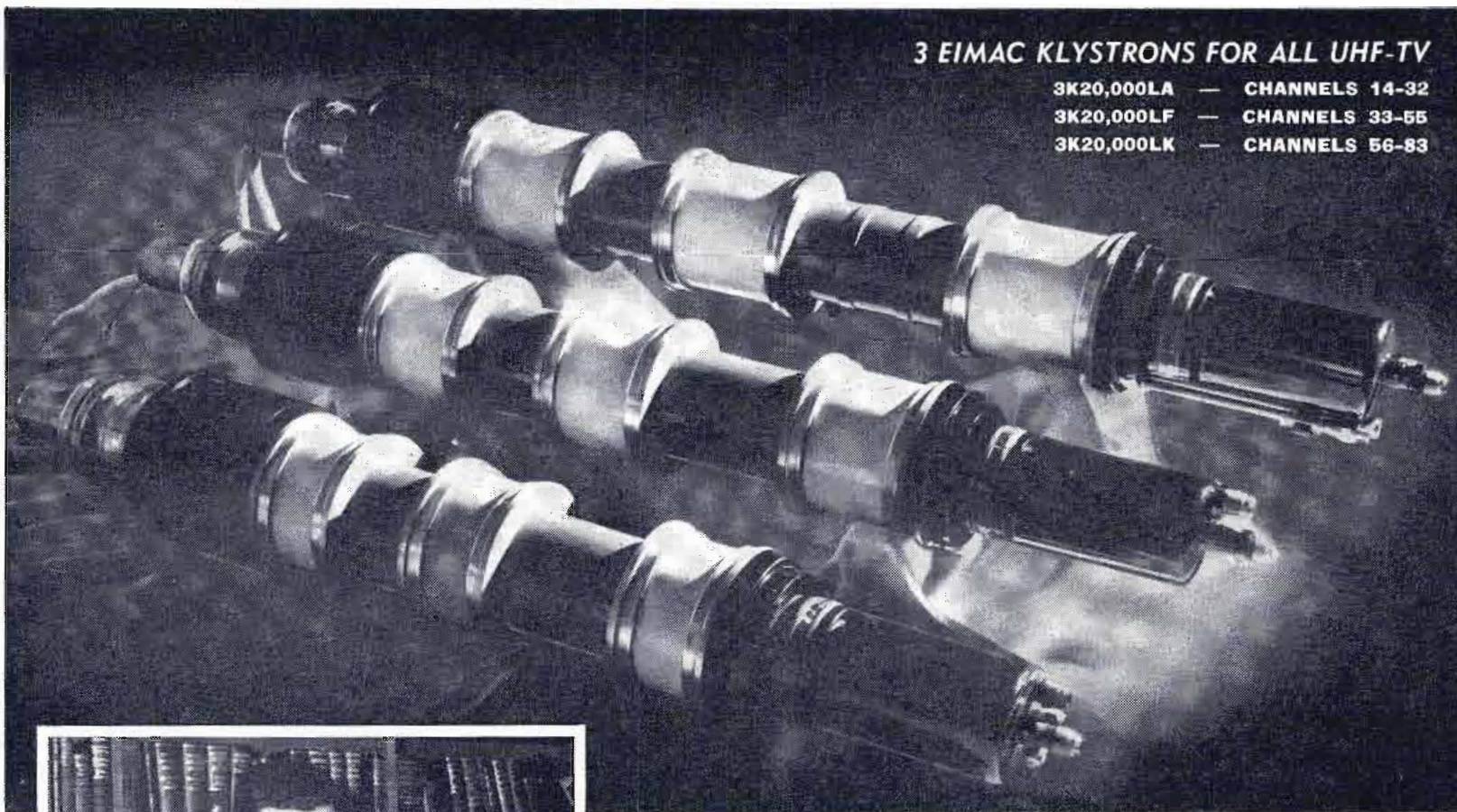
For more facts and information write for the new Visualizer Bulletin No. 750-TT.

*\*Met-L-Flex is the copyrighted designation for the all-metal resilient cushions developed and pioneered by Robinson.*

**ROBINSON AVIATION INC.**  
TETERBORO, NEW JERSEY  
*Vibration Control Engineers*

### 3 EIMAC KLYSTRONS FOR ALL UHF-TV

3K20,000LA — CHANNELS 14-32  
3K20,000LF — CHANNELS 33-55  
3K20,000LK — CHANNELS 56-83



## Eimac 5 kw Klystrons Offer These Features for UHF-TV...

**THREE TUBES** that cover the entire spectrum, 470-890 mc. This means simplification of equipment design, economical mass production and a minimum of stock piling problems.

**HIGH POWER AND SMALL SIZE** that not only makes top performance possible but allows easy handling for maintenance and installation. In typical operation the Eimac klystrons deliver a peak sync output of 5.5 kw., with a collector dissipation of 14 kw., and a power gain of 20-25 db.

**MASS PRODUCTION** that means early delivery and guarantee of klystrons in the future. All three of the series are now coming off the production line.

**EXTERNAL TUNING** that increases the tuning range; eliminates mechanical distortion of tube structure; permits use of optimum cavity construction and provides design freedom in R-F circuits for equipment engineers.

**LOW-LOSS CERAMIC CAVITIES AND COPPER-TO-CERAMIC SEALS** that eliminate off-the-air hours caused by heat and thermal shock.

FOR FURTHER INFORMATION CONTACT OUR  
TECHNICAL SERVICES DEPARTMENT.



**EITEL - McCULLOUGH, INC.**  
SAN BRUNO, CALIFORNIA  
Export Agents: Frazar & Hansen, 301 Clay St., San Francisco, California



making  
**"SPECIALS"\*** out of  
**STANDARDS...**



at **SPECIAL  
 CONTROLS**

**HEADQUARTERS**

\*There isn't the price differential you'd expect between Clarostat *standard* controls and those *special* controls you need.

Using established designs, elements and production facilities for standard controls made by the tens of thousands, Clarostat engineers can come up with ingenious modifications at *marked savings to you*.

Note the standard 1 1/8" carbon control that became a dual-concentric with locked semi-permanent settings. Or the 15/16" standard which, with rubber gaskets, meets water-tight requirements.

Making "specials" out of "standards" is all in the day's work at Clarostat, when you're *economy-minded*.

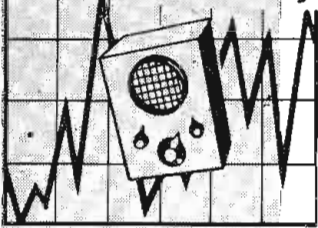


Send us those "special" control requirements for the most economical solution. Engineering data, quotations, delivery schedules, on request.

**CLAROSTAT Controls and Resistors**

CLAROSTAT MFG. CO., INC., DOVER, NEW HAMPSHIRE  
 In Canada: Canadian Marconi Co., Ltd., Toronto, Ontario

## What is your Delay or Regulating Problem?



For the most effective solution use the  
**SIMPLEST, MOST COMPACT**  
**MOST ECONOMICAL**  
**HERMETICALLY SEALED**

# AMPERITE THERMOSTATIC DELAY RELAYS



STANDARD

Provide delays ranging from 2 to 120 seconds.

- Actuated by a heater, they operate on A.C., D.C., or Pulsating Current.
- Hermetically sealed. Not affected by altitude, moisture, or other climate changes.
- Circuits: SPST only—normally open or normally closed.

Amperite Thermostatic Delay Relays are compensated for ambient temperature changes from  $-55^{\circ}$  to  $+70^{\circ}$  C. Heaters consume approximately 2 W. and may be operated continuously. The units are most compact, rugged, explosion-proof, long-lived, and—very inexpensive!

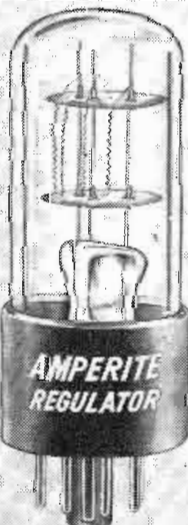
TYPES: Standard Radio Octal, and 9-Pin Miniature.

PROBLEM? Send for Bulletin No. TR-81



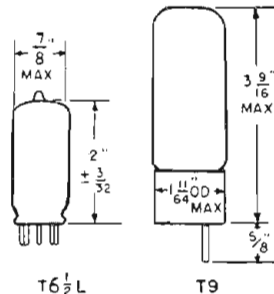
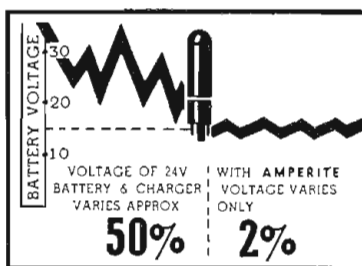
MINIATURE

# BALLAST-REGULATORS



T9 BULB

- Amperite Regulators are designed to keep the current in a circuit **automatically regulated** at a definite value (for example, 0.5 amp).
- For currents of 60 ma. to 5 amps. Operates on A.C., D.C., or Pulsating Current.
- Hermetically sealed, light, compact, and most inexpensive.



Maximum Wattage Dissipation: T6 1/2 L—5W. T9—10W.

Amperite Regulators are the simplest, most effective method for obtaining **automatic regulation** of current or voltage. **Hermetically sealed**, they are not affected by changes in altitude, ambient temperature ( $-55^{\circ}$  to  $+90^{\circ}$  C), or humidity. Rugged; no moving parts; changed as easily as a radio tube.

Write for 4-page Technical Bulletin No. AB-51

**AMPERITE CO., Inc. 561 Broadway, New York 12, N. Y.**

In Canada: Atlas Radio Corp., Ltd., 560 King St., W., Toronto 2B

## LETTERS

(Continued from page 76)

tion." Many commercial FM transmitters use phase shift modulators. The time differences observed by an MTI radar in moving target returns are precisely equivalent to a Doppler shift of the reflected target energy. This is made clear in Volume I of the M.I.T. Radiation Laboratory Series, "Radar System Engineering," edited by Louis Ridenour. On page 629 of the First Edition of this standard work, it is shown quite simply how the Doppler effect and the time difference between pulses are equivalent ways of looking at the same thing. To quote:

"Note that the Doppler effect can be viewed as causing a phase shift of the echo from pulse to pulse. It is easy to calculate this phase change and to show that it is equivalent to the frequency shift. The distance traveled by the target between pulses is  $vT$  where  $T$  is the repetition period. Hence each pulse travels a distance of  $2vT$  less than the preceding pulse. This is  $2vT/\lambda$  wavelengths so that the phase change is  $2\pi \cdot 2vT/\lambda$  between each pulse and the next. The beat frequency is then  $2v/\lambda$  as before."

Realizing this equivalence between the time or phase shift of the returned pulse and a Doppler or frequency shift makes it no longer so surprising that, as Mr. Bachman writes, "... the Doppler formula ... can tell when to expect 'optimum' and 'blind' speeds. ... " If it were true, as he says in the same sentence, that "... the Doppler effect does not affect MTI operation ... "

(Continued on page 152)

## Citations for Service to Radio

The five citations presented by the Radio Pioneers at Los Angeles convention of National Assoc. of Radio-TV Broadcasters on April 27, "to men who are making outstanding contributions to the radio industry today," were as follows:

"To Dr. Vladimir K. Zworykin—for his extraordinary career and brilliant inventions and development in the field of electronic television.

"To Dr. E. F. W. Alexanderson—for his basic contributions to radio and television, including hundreds of original techniques and devices during a career of more than half a century.

"To John V. L. Hogan—who has the unique distinction of having started a long and useful career in radio by assisting Dr. Lee de Forest in the creation of the first amplifying vacuum tube.

"To Dr. Orestes H. Caldwell—for a brilliant career as an editor and publisher in the electrical, radio and television fields over a period of more than 40 years.

"To Donald Manson—for a long and fruitful career in radio and television broadcasting in Canada, which includes major contributions to the creation and growth of the Canadian Broadcasting Corporation."

# TELE-TECH

& ELECTRONIC INDUSTRIES—RADIO-TELEVISION

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O. H. CALDWELL, Editorial Director ★ M. CLEMENTS, Publisher ★ 480 Lexington Ave., New York (17) N. Y.

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## Training Young Engineers for Future *Executive Leadership*

All reports coming from the Engineering Manpower Committee indicate that the shortage of technical men becomes more critical each year. Yet never have there been so many opportunities for technical men in top administrative positions in the radio and electronic industries.

Engineering executives are needed who can coordinate science, industry, economics, and public affairs. Our own electronic art has become so complex that, more and more, a corporation's executives must be taken from its own ranks. At the same time, as companies grow in size, human and business relationships are becoming more important.

Radio engineers, concentrating on engineering problems, usually fail to recognize their own shortcomings in broader grasp. They often deliberately pass up opportunities for study and experience that would fit them for general executive leadership.

Radio companies are just beginning to face this problem of technically-qualified management. But already it is well recognized in the older engineering industries. Their business leaders for some years have taken steps to meet the situation. No longer are they willing to depend upon "the crisis method of executive selection." Promising young employees are

- (1) "Screened" for leadership qualities and
- (2) Guided into interim posts where they will have broad training and experience.
- (3) Programs for rotating such key juniors, are formed to give wide knowledge of company operations in the shortest time.

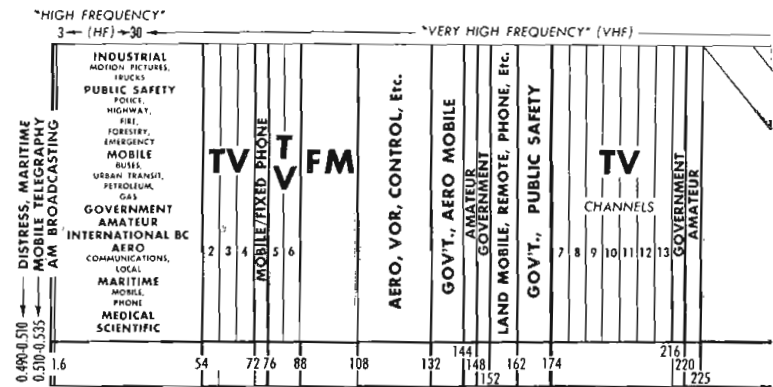
(4) Business extension courses are now being offered to technical men seeking a broader base of business knowledge. Wharton at Philadelphia, Harvard School of Business and the Massachusetts Institute of Technology in the Boston area, the University of Pittsburgh and Carnegie Tech at Pittsburgh, and other institutions in Chicago and on the Pacific Coast are serving to give technical men a new grasp and understanding of the industries in which they work. Such outside training courses show engineers the doors to executive openings.

In any group of upcoming youngsters with technical degrees, 10% or so are likely to possess the genes of leadership and executive ability. It is important to pick out these promising juniors early, and by inside company experience and outside business training, fit them for the heavy responsibilities of top management.

With such a long-time plan in operation, no longer need our radio and electronic companies depend on the now-customary "crisis method of executive selection."

# RADARSCOPE

Revealing Important Advances Throughout the Spectrum  
of Radio, TV and Tele Communications



## TRANS-ATLANTIC

"CORONATION THROMBOSIS" is the name being tagged on TV network preparations to cover the June 2nd Coronation of Queen Elizabeth II in London. Reason for the heart palpitations is the competitive spirit between CBS and NBC. Both networks have spent much money and effort preparing to get film recordings across the Atlantic. NBC has set 6:00 PM, a few hours after the event takes place. Each network wants to be the first on the air with the story, and neither wants the other to know how it is planning to shave minutes off the transportation and processing time. BBC is the only company permitted to telecast the actual crowning of the Queen in Westminster Abbey. RAF jet bombers are expected to fly kinescope recordings across the Atlantic. NBC has set 6:00 PM, EDT, as the time for their first TV program, while their AM broadcasts will cover the ceremony live from 6:30 AM. They have also hired famed speed flier Paul Mantz to fly film back to the U. S. in a souped-up P-51. CBS has also put much work into the project, and is planning to use about \$200,000 worth of equipment, including some ten 35-mm cameras, rapid film process, and magnetic tape equipment. They have modified a Boeing Stratocruiser so that film can be dubbed and edited while en route from Great Britain. CBS has also altered its electronic equipment to enable it to operate directly from 50-cycle power lines. Regardless of which network is first with the story, the viewing public is assured of first-rate news coverage.

## NEW HORIZONS

**FINANCING INVENTORS**—Bing Crosby has set up his company for the stated purpose of helping independent inventors. This is a good idea, both for the poor inventors and, on occasion, for Bing. There must be many other rich persons who have established funds for financial aid and some who actually have set up laboratory facilities to help the friendless, small inventor. Tele-Tech will attempt to collect a list of these. There must be hundreds of inventors among our readers who would be interested. In such connection, we hope to be able to list laboratories where inventors could come and do development work on some cooperative, profit-sharing basis. The experiences of some financiers in backing electronic inventions of independent inventors might be included. It might encourage more men, who can afford to take long risks with their money, to establish Foundations to help the worthy. Also the safeguard of technical advice regarding the

merit of the proposed ideas should be emphasized. How often the capitalist has been fooled by the smooth-spoken "inventor"!

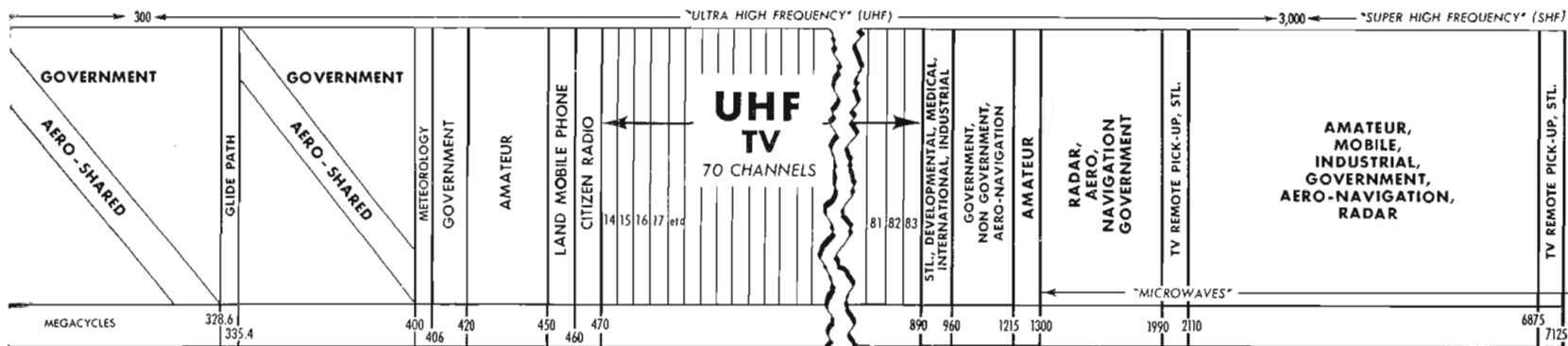
## AVIATION

**DME**—Airborne Distance Measuring Equipment, which uses radar techniques to measure distance between planes in flight and ground beacons of the Civil Aeronautics Administration, will soon be made available to commercial and private aviation by Bendix and Hazeltine. Airborne DME operates independently to provide distance information or can be used with Bendix electronic equipment to give pilots distance plus direction to a ground beacon. The newest aviation safety device, DME operates on the principle of measuring the elapsed time—within highly accurate limits—of a signal transmitted by an airplane and replied to from the ground. Measurement of the time required for the plane-to-ground and ground-to-plane signals is converted electronically into a mileage reading on the pilot's instrument panel. The latest-type transport planes are being delivered with facilities provided for ready installation of the airborne DME units as soon as they are available.

## TELEPHONY

**NEW DIALING SYSTEM** will eventually be forthcoming to replace conventional 10-hole circular rotatable telephone dial. Object of the radically new system, which is still an impressive distance away from the production stage, is to drastically reduce the money-consuming time it takes a phone subscriber to dial a number. During this time, the subscriber cannot receive an incoming call, and the telephone company cannot charge the customer until the connection is completed—even though a line is being tied up. In order to appreciate the magnitude of the problem, consider the more than 13 million phone calls made in the city of New York in one day. Assuming it takes 10 seconds to complete an average dialing operation, the telephone company has been required to maintain the equivalent of over four unit-years of unchargeable service in just one day in one city.

To reduce this expense, and to provide more convenient service for its customers, there are indications that AT & T will eventually introduce a rapid dial system using push-buttons instead of a circular disc. Operating procedure is expected to be as follows: 1) Subscriber pushes series of numbered buttons in order dictated by desired telephone number, 2) Subscriber lifts receiver from cradle, 3) Depressed buttons, which have individual con-



tacts to actuate pulse or tone identification of different numbers, automatically send signals to central switch-board in same sequence as they were depressed. Since the phone would be free to receive calls until the receiver is lifted, the dialing time which ties up the line would be cut to one or two seconds.

### INVENTION

**PATENTS FALL OFF**—John A. Marzall, U. S. Commissioner of Patents, reports that, figuring on a per capita growth basis, applications for patents have fallen back to the level of 1866. There was a continuous rise in the number of patent applications filed in the period from 1840 to 1921. With the beginning of the machine age, after 1866 the number of applications filed rose rapidly. Then came the slump in 1921. In 1951 there were about 4,000 less applications filed than in 1950. 1952 held to about the same level as 1951. Had the ratio of increase for applications filed kept pace with our population growth since 1921, the Commissioner said, "We should be filing considerably over 130,000 per year, instead of the 60,000 filed last year."

### MANUFACTURING

**COLORED CORED SOLDER** is the up-and-coming trend in the manufacture of TV and electronic equipment. Primarily the various flux colors are intended to identify the production source or circuit function. For example, different color schemes could be used in receiver solder joints to indicate r-f, i-f and audio stages.

Production trouble points could be traced quickly by employing a particular color on certain sections of the production line. If different solder manufacturers use key colors, solder alloys could be readily identified even though they were removed from the original reels. Also, the operator benefits by recognizing that the appearance of the coloring matter means the joint is soldered, thereby saving solder and preventing the overheating of components. Already the London firm of H. J. Enthoven & Sons, Ltd., have made available solders with red, blue, green, yellow and purple flux cores, and more on the way.

### INTERNATIONAL

**FRANCE** proposes eventually to build 40 TV stations to bring the programs of Television Française within the reach of the entire population, Emile Hugues, French Minister of Information, told the National Assembly. Such a network of stations would cost, M. Hugues estimated, more than 20,000,000,000 francs, so that there could be no question of its completion in the immediate future. However, construction work is going ahead.

In addition to the Paris station, three others will be in operation this year, M. Hugues said, one at Strasbourg, one at Lyons and another at Marseilles. These, together with three others—at Amiens, Nancy and Guebwiller (Alsace)—for which funds have been earmarked in the 1953 budget, will enable a third of the French population to receive TV programs.

### NTSC Puts Final Refinements on Color-TV Standards for FCC Review

Left to right: Rear Row—Standing: I. J. Melman, CBS-Columbia; John Miller, Bendix; I. J. Kaar, GE; J. W. Christensen, CBS; C. J. Hirsch, Hazeltine; L. R. Fink, GE; Robert Miller, Sentinel; W. MacDonald, McGraw-Hill; R. Hodgson, Chromatic TV Labs; J. M. Barstow, Bell Labs; Wm. Feingold, Emerson. Seated—Far Row:—Dr. A. N. Goldsmith, Inventor and Consultant; A. V. Loughren, Hazeltine, Vice-Chairman NTSC; Dr. E. Engstrom, RCA Labs, Vice-Chairman NTSC; Dr. W. R. G. Baker, GE, Chairman NTSC; D. Smith,

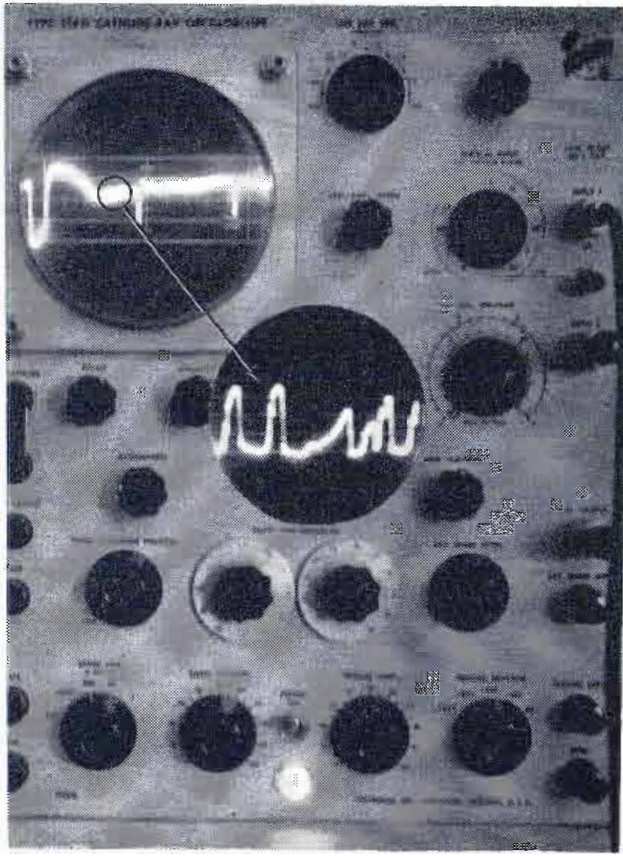
Philco, Vice-Chairman NTSC; Ralph Harmon, Westinghouse; W. T. Wintringham, Bell Labs; K. McIlwain, Hazeltine; Dr. O. H. Caldwell, TELE-TECH & ELECTRONIC INDUSTRIES, Caldwell-Clements; Jerome Bresson, Tele King. Seated—Front Row:—L.M. Clement, Crosley; R. DeCola, Admiral; Dr. R. M. Bowie, Sylvania; A. G. Jensen, Bell Labs; D. E. Harnett; John Rennick, Zenith; R. E. Shelby, NBC. Mrs. Martha Kinzie, indispensable secretary and "guardian angel" of NTSC, has a portrait all to herself, on page 351.



# Magnetic Transient

**Random frequency spectrums, often impossible to observe on oscilloscopes, may now be studied with new recorder. Pulses recorded on magnetic drum are pulse-time-modulated and then demodulated for playback display**

**BY JOSEPH RACKER** *Magne-Pulse Corp.*  
140 Nassau St., New York, N. Y.



**Fig. 1:** Portion of radium radiation waveform may be selected and expanded on oscillograph

**R**ADIATIONS emanating from radium or other substances occur at a random frequency. Consequently, it is impossible to observe such phenomena on an oscilloscope in a conventional manner. In order to observe the waveforms created by radium one method is to record them first on a magnetic material and then "play back" the recording at a periodic rate so that it can be displayed on an oscilloscope. Fig. 1 illustrates a typical radium pulse that has been so recorded and displayed.

### **Alternative Method**

An alternative method of recording such waveforms would be to use an oscilloscope camera to photograph these pulses as they occur. However, this method has the disadvantage of taking a relatively long period of time to determine results. By recording magnetically the waveform can be observed immediately; the sweep time expanded so that any particular portion of the curve can be amplified and studied in detail; and radiation or other phenomena adjusted, when possible, to give desired waveform. Furthermore, a magnetic recording can be analyzed in other ways, such as determining the frequency com-

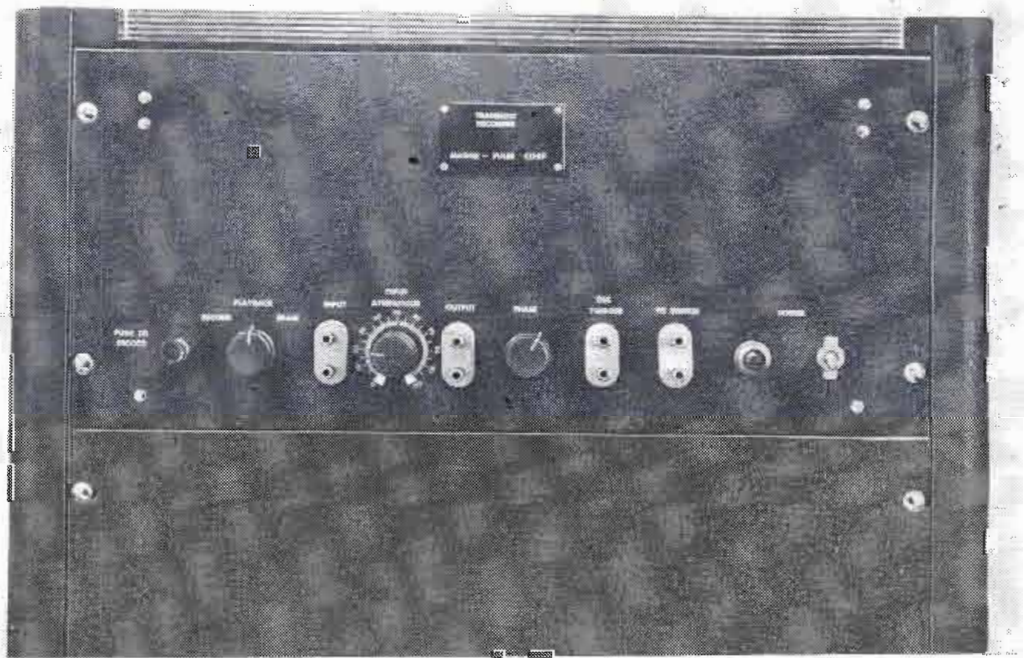
ponents in such a pulse by applying the magnetic transient recorder output to a spectrum analyzer.

When a recorded waveform is applied to a reading head, the EMF induced is a function of  $L \frac{d\phi}{dt}$ . That is, the waveform is differentiated. When recording sine waves, such as speech and music, this factor is not important since the ear cannot distinguish between sine waves or their derivative, cosine waves. However, the derivatives of most non-sinusoidal waveforms are radically different from the original waveform. Consequently, if techniques used in conventional audio recording were employed, it would be necessary to integrate the output of the magnetic recording to obtain the original waveforms. Since circuits which act as good integrators are effective over a limited frequency range (four octaves is the

practical range with compensation), the bandwidth of such a system is therefore extremely limited.

### **Basic Problem Overcome**

The Type 103 Magnetic Transient Recorder, shown in Fig. 2, was designed to overcome this basic problem. In this equipment the incoming pulse is first transformed into a train of pulse-time-modulated pulses. These pulses, which have a constant amplitude but vary in time as the modulation, are applied to the recording head. The magnetic output is picked up by the head and the time between the picked-up pulses and the reference pulses are determined. Since only the timing is of importance, the fact that the pulses are differentiated in reading out does not affect the system. This time modulation is then converted back



**Fig. 2:** Panel view of magnetic transient recorder that transforms input into PTM pulses.



# Recorder for Radiation Pulses

into the original waveform. Consequently, the original waveform is recovered exactly and hence this device is a true *transient* recorder.

## Pulses Fed into Modulator

An overall simplified block diagram of this unit is shown in Fig. 3. Reference pulses, obtained from the pulse generator, are applied to the PTM modulator. These pulses are uniformly spaced. Each pulse is then shifted in time by an amount that is a function of the input voltage. These latter pulses are then applied to the recording head when the switch is in RECORD position. The pulses are then recorded on the magnetic drum (tape can be used for some applications) which is driven by a motor when the start switch is depressed. At the end of a complete revolution, a switching circuit (not shown in block diagram) prevents further record pulses from being applied to the drum.

## Displaying Information

When the information is to be displayed, the switch is placed in PLAY BACK position. In this position the pulses that have been recorded on the drum are picked up by the recording head and are fed to the demodulator. Also fed to the demodulator are the reference pulses. By comparing the two pulse trains and passing the resultant voltage through a low pass filter the original signal is recovered. Note that the signal is repeated each time the drum makes a complete revolution so that a recurrent signal is obtained at the output which can be displayed on an oscilloscope.

When the signal is no longer desired, the drum can be returned to a "no signal" condition by applying the erasing current to the recording head. This current is opposite in polarity to the recording current and effectively demagnetizes the drum. Some of the fine points of this instrument not shown on the block diagram are: a "transient trigger" circuit in which the transient voltage triggers the recording cycle and an output voltage which triggers the transient. Thus it is possible to have the transient automatically trigger the start switch or have the start switch trigger the transient.

## Detailed Description

Most of the circuits used in this equipment employ standard techniques. Of particular interest however are the PTM modulator, the recording circuit, and the PTM demodulator. These circuits are described in subsequent paragraphs.

The PTM modulator consists of a cathode-coupled one-shot multivibrator whose duration is a function of the transient signal applied to the grid of V2. In the absence of triggering pulses, V1 is cut-off due to the cathode voltage developed across common cathode resistor R6, while V2 is conducting because its grid is tied back to the B+ voltage. Upon application of a triggering pulse (waveform 1 in Fig. 4) V1 is driven

to conduction and the negative pulse developed across R4 is applied to the grid of V2 through capacitor C2. The cycle is initiated whereby V2 is driven below cut off.

## Cut-Off Value

As capacitor C2 discharges the grid voltage of V2 increases in the positive direction until it reaches positive cut-off and the cycle is reversed (see waveform 2, Fig. 4). The time required for the pulse to reach this cut-off value is a function of the RC constant of the circuit and the instantaneous value of the transient voltage at that time (waveform 3). The output voltage obtained across the plate load resistor R5 is therefore a series of positive pulses whose width varies as the instantaneous amplitude of the transient voltage.

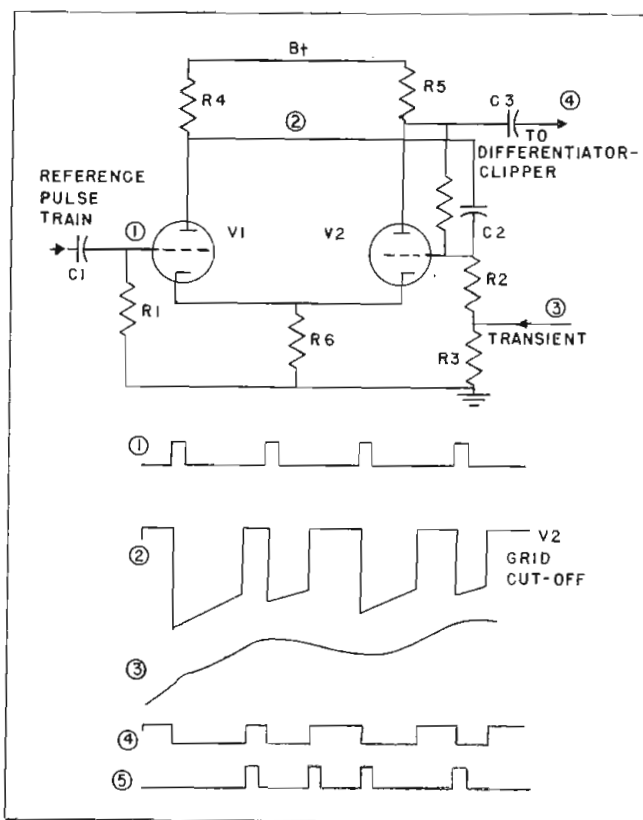
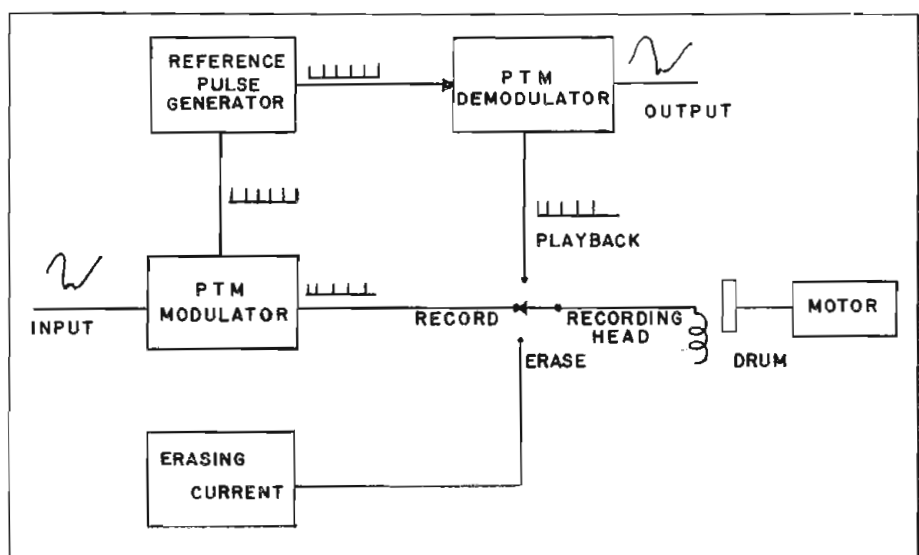
The width-modulated pulses are then applied to a clipper and differentiator circuit which provide a time modulated series of pulses, as shown by waveform 5, corresponding to the leading edges of the width modulated pulses. It is these pulses that are fed to the recording head.

## Recording System

The recording system consists of a motor, a coated brass drum, and a recording head as illustrated in Fig. 5. The recording head is placed about 0.001 in. from the drum. The

Fig. 3: (1) Block diagram of transient recorder shows how reference pulses are shifted in time by input and then applied to motor-driven magnetic drum

Fig. 4: (r) PTM modulator consists of a cathode-coupled one-shot multivibrator. Width-modulated pulses of waveform 5 are fed to magnetic recording head



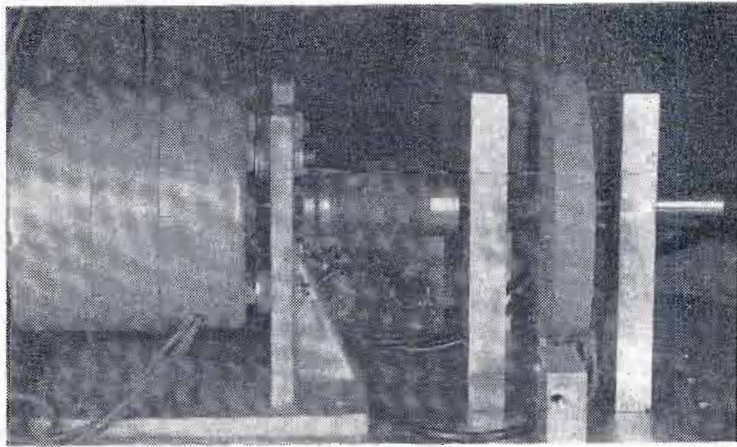


Fig. 5: Close-up of motor, drum and recording head assembly

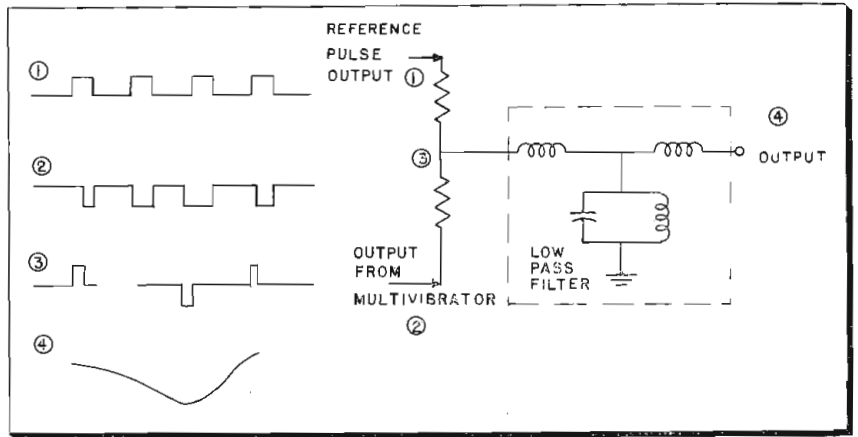


Fig. 6: Reference and multivibrator pulses combine in demodulator

pulses fed through the recording head are of sufficient amplitude to drive the magnetic field beyond the saturation portion of the curve. In normal audio recording applications it is necessary to operate over the linear portion of saturation curve to minimize distortion. However, if the drum-to-recording head distance varies as the drum rotates, the magnetization varies and the output voltage is distorted.

By using PTM it is possible to use the saturation portion of the curve as the operating point since we are interested only in the timing of the pulses. Slight variations of recording head-to-drum distance as the drum rotates does not affect the recovery of the original intelligence. To erase, a negative pulse of current is applied to the recording head.

**PTM Demodulator**

The pulses picked up by the recording head with the switch in play back position is fed to another multivibrator whose output pulse duration is a function of the timing of the applied pulses. The output pulses of this multivibrator have the same waveshape as the width-modulated output pulses of the PTM modulator. These width-modulated pulses are fed to the demodulator together with the reference pulses.

Fig. 6 is a simplified schematic of the demodulator. The reference pulses, which have a constant duration equal to an amplitude of 0.5 volts, are applied to one end of a resistive input network while the width-modulated pulses are applied to the other end. Since these pulses are applied to opposite ends, they tend to cancel each other at the center tap. The signal existing at the center tap may be positive, negative, or zero depending up the width of the signal pulses. These pulses are then fed to a low pass filter.

The pulses applied to the low pass

filter have the following frequency components: the original transient voltage components and the reference pulse carrier and sideband components. The reference pulse carrier frequency is made at least twice the highest transient voltage frequency so that these components

pulse duration increases, the filter output increases. Consequently, the output of this circuit is a function of the pulse width of the applied signal. Of course, the RC filter depicted does not have a sharp frequency cut-off characteristic required to recover the original signal. The low pass filter shown in Fig. 6 does provide the frequency response characteristic necessary to attenuate completely all of the reference pulse energy.

**Test Set-Up**

A Geiger-counter is used to detect the radiation in the test set-up. The output of the Geiger-counter is connected to the input terminals of the Magnetic Transient Recorder. The output of the recorder is applied to the input terminals of an oscilloscope. An oscilloscope trigger output connection on the recorder is connected to the trigger input connection of the scope.

When radiation pulses are to be recorded, the record switch is first placed in ERASE position and then to RECORD. At the instant that a recording is desired the start switch is depressed. Then the record switch is placed in PLAY BACK position and the Geiger pulses recorded are displayed on the scope.

**Other Transients**

Of course in a similar manner other types of transients such as appear in power lines, B+, relays, switches, etc., can be recorded and displayed. In addition, by the use of additional heads, it is possible to record a number of transients simultaneously and play them back one by one. For good high frequency response, a magnetic drum is used to obtain greater surface speeds. Where a lower frequency response characteristic is sufficient, tape can be employed.

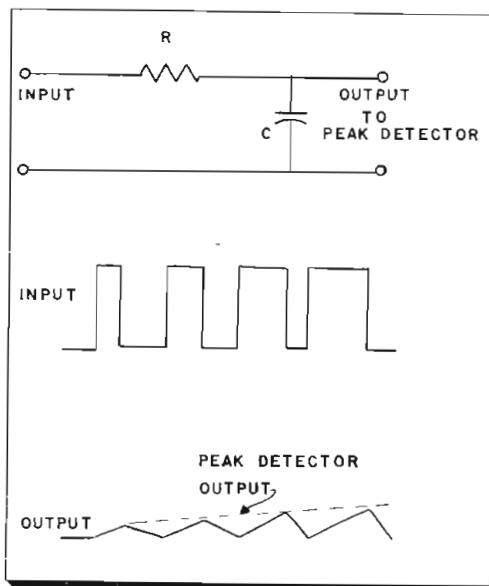


Fig. 7: Low-pass RC filter and waveforms

can be separated. Therefore, the low pass filter, which passes only frequency components up to one-half the reference pulse carrier frequency, passes only the original transient voltage components and attenuates the carrier and sideband frequencies. Consequently, the output of the filter is the original transient voltage.

To obtain a better physical understanding of the action of the low pass filter, consider the output voltage obtained from a single low pass RC filter when a series of width-modulated pulses are applied to its input as shown in Fig. 7. When a narrow pulse is applied to the circuit, the capacitor can only charge up to a small voltage due to the small duration of the pulse. As the

# Filter Insertion Loss in the 10-1000 MC Range

**Increasing importance of broadband, low-pass filters, particularly for r-f interference suppression, points up need for standardized measurement techniques**

By **SCOTT SHIVE**, Signal Corps Engineering Labs,  
Fort Monmouth, N. J.

**B**ROADBAND, low pass filters operating effectively in the region between 0.15 and 1000 mc are assuming ever greater importance in the field of radio interference suppression, but at the present time a very real problem exists in accurately evaluating filter performance at frequencies appreciably above 10 mc. Standardized measurement procedures and equipment are needed both by filter manufacturers and purchasers to check quality of production and also as a laboratory instrument for investigating the high frequency behavior of experimental filters.

## Definition

The insertion loss of a filter connected into a transmission system is defined as the ratio of voltages appearing across the line immediately beyond the point of insertion, before and after insertion. With reference to Fig. 1, insertion loss of the filter under test is the ratio of the voltage across the load when the filter is not present to that across the load when the line connecting source and load is broken and the filter inserted. Insertion loss data provides specific information as to what the effect of applying the filter between a given source and load impedance will be on the current into, or the voltage across, the load. It is interesting to note that the insertion loss characteristic of a filter is directly indicative of the effectiveness of the unit as a radio interference suppression component, inasmuch as the criterion of suppression effectiveness is likewise the

degree to which high frequency voltages existing across a given line will be reduced by application of the filter.

The basic measuring circuit is shown in Fig. 2a. It consists of a calibrated r-f sine wave voltage source supplying a signal through a coaxial transmission line to the signal generator isolation pad, thence through a line to the filter under test, from the filter to the receiver isolation pad for the "filter-in" condition, or directly from the signal generator isolation pad to the receiver isolation pad for the "filter-out" condition; and thence to the signal detector or receiver. The operating procedure consists of tuning both signal generator and receiver to the particular test frequency, then the ratio of two signal generator output voltage readings; the first,  $E_1$ , is that required to provide a convenient signal detector indication with the filter out of the circuit; the second,  $E_2$ , is that required to provide the same signal detector indication when the filter is inserted. The insertion loss ratio is then  $E_2/E_1$ , expressed in db, insertion loss is  $20 \log_{10} (E_2/E_1)$ .

The alternate measuring circuit, Fig. 2b, differs from the basic circuit only by the inclusion of coaxial switches to facilitate the tedious operation of switching from filter-in to filter-out.

## Instrumentation

The actual metering, that is, the relative evaluation of signal levels, is accomplished by the output attenuator of the signal generator, while the receiver, or signal detector,

functions merely as a fixed reference point indicator. Thus, measurement precision is independent of receiver characteristics and depends directly upon the signal generator attenuator accuracy. The attenuator need not be calibrated in absolute volts of output, since insertion loss is measured only in terms of a ratio; however, the attenuator must accurately indicate voltage increments. The desirable characteristics of the signal generator should include, in addition to attenuator precision, sufficient voltage output, the higher the better, good shielding to minimize radiation leakage, good filtering to prevent r-f conduction back into the power lines, and provision for connecting a standard coaxial cable to the output. Output impedance should be constant with attenuator setting and preferably, though not necessarily, with frequency as well. The receiver should be sufficiently sensitive, well shielded, and likewise fitted with a coaxial antenna input. Frequency drift of both signal generator and receiver should be low. Coaxial switches, if used, should introduce no appreciable discontinuity in the r-f lines.

## Isolation Pads

Since the insertion loss of a device is a function of the impedances between which it is inserted, and therefore measurement data are significant only when the source and load impedances are stated or implied, it is essential that the characteristics of these impedances be completely known and specified. While in the past, a number of insertion loss measuring systems have used

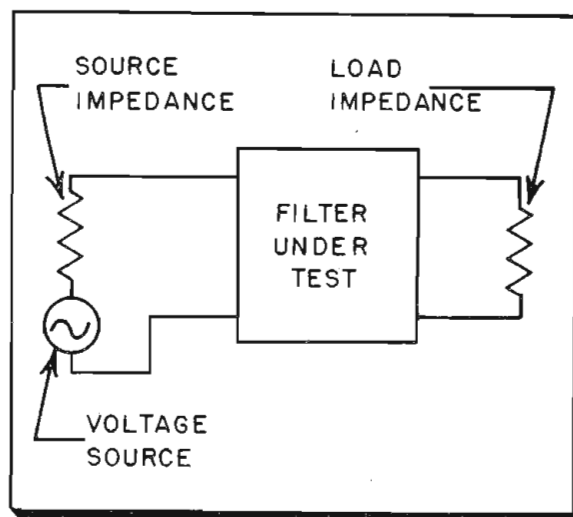


Fig. 1: Filter insertion loss is determined by ratio of load voltages with and without filter

# FILTER INSERTION LOSS (Continued)

20 ohms for source and load, and while valid measurements could theoretically be made between any finite impedances, so long as they were accurately known at each frequency of measurement, it has been found most convenient to fix the impedances looking in either direction from the filter under test at 50 ohms resistive and to maintain them at this value over the complete frequency range of testing. If signal generators and signal detectors were available with exactly 50 ohms output and input respectively at all frequencies, no isolation networks would be needed. But since such instruments are not generally available today, isolation pads must be used, as the name implies, to provide sufficient isolation between the filter under test and the signal generator on one side and the signal detector on the other such that 50 ohms resistive is always presented to the filter at all frequencies regardless of the maximum impedance changes of either signal generator or detector. Ten db of isolation per pad is generally sufficient for usual production testing, although for extremely precise laboratory measurements, up to 20 db may be desired. Pads should have low VSWR, preferably not more than 1.2 at any measurement frequency. The commercial availability of 10 db, 50 ohm pads with good VSWR, less than 1.2, from dc to 1000 mc is one cogent reason for

adoption of the 50 ohm standard for source and load impedances.

When a filter is connected into the measuring circuit between the isolation network pads by means of finite lengths of transmission line, which include the connectors, the r-f coaxial switches, and any sections of connecting cable, the isolation networks themselves are no longer the source and load impedances. At high frequencies, the true source impedance insofar as the filter is concerned is that looking into the transmission line toward the source from the end of the filter's input terminal. Similarly, the true load impedance is that looking toward the load from the end of the filter's output terminal. (See Fig. 2). Since the input impedance of a transmission line varies with frequency and line length, unless the line is properly terminated in its characteristic impedance, the source and load impedances presented to the filter will likewise vary, though the pads themselves remain perfectly constant, unless the connecting lines between filter and isolation pads are either very short compared to a quarter wavelength (one-quarter wavelength in air dielectric is approximately 3 in. at 1000 mc) or unless the impedance of the lines throughout their length matches that of the pads.

It is not always feasible to make the connecting lines very short, so it then becomes necessary to select

connecting lines whose impedance matches the pads. Thus, if the filter is to be inserted between 50 ohm impedances, the 50 ohm pads must be connected to the filter by means of 50 ohm cables and connectors. This insures fulfillment of one of the fundamental requirements of accurate insertion loss measurement, namely, that the filter under test be inserted between source and load impedances which remain constant and known throughout the entire frequency range of measurement. Also, the fact that the measurement is rendered independent of line length by matching connecting lines to pad impedances is an extremely important aspect of this system not only from the standpoint of eliminating a source of error but also in being easily able to duplicate measurement on different equipments.

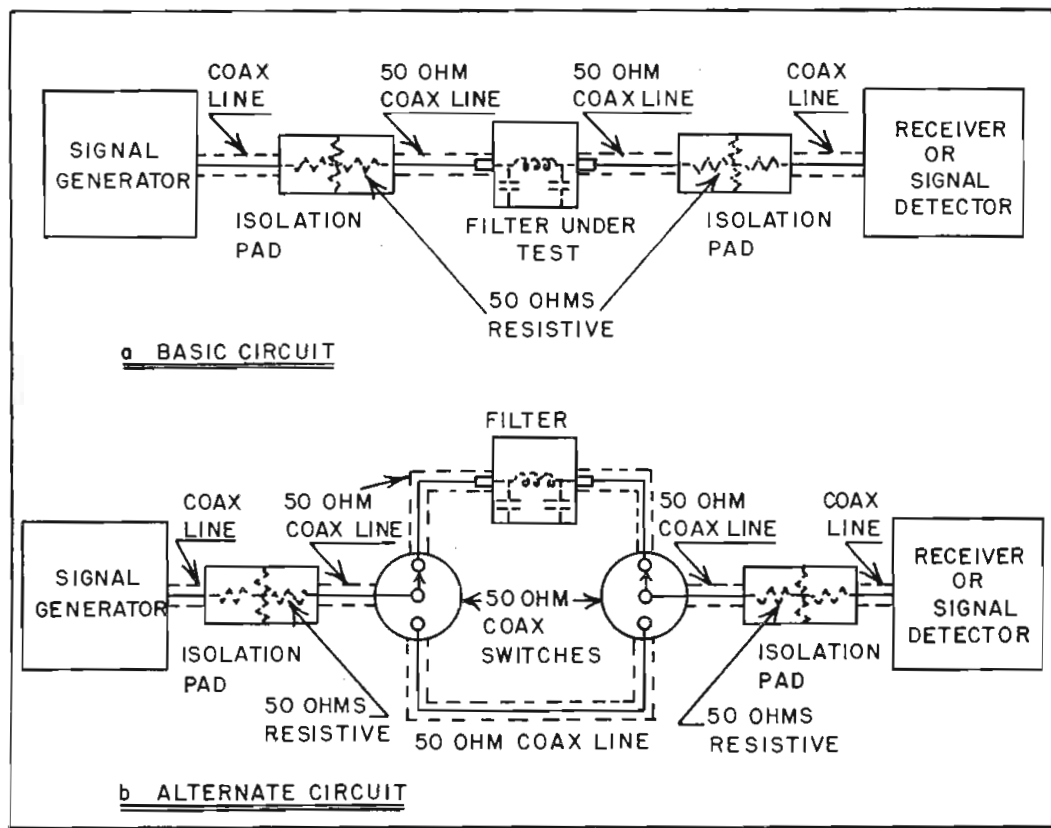
### Measurement Error

To demonstrate the magnitude of insertion loss measurement error that may be incurred by mismatch between connecting line and isolation pads, consider the case of a filter measured between 20 ohm pads connected to the filter through 50 ohm lines 3 in. long. At frequencies up to approximately 10 mc, the connecting lines are electrically short and the impedances as seen by the filter are virtually the 20 ohms of the pads. However, as frequency increases beyond this point the impedances as seen by the filter also increase until at the frequency for which the lines become one quarter wavelength, or approximately 1000 mc, assuming air dielectric line, the filter is effectively inserted between 125 ohms instead of 20 ohms. The filter would therefore appear to be as much as 6.25 times more effective or have up to 15.9 db more insertion loss than it would actually provide if inserted between 20 ohms. If the connecting lines were longer or if the velocity constant were lower, as for any solid dielectric material, the measurement error would begin to become appreciable and the point of maximum error would occur at correspondingly lower frequencies.

### Commercial Units

Radio interference suppression filters as manufactured commercially are at present furnished with a great variety of terminals, including solder lugs, studs, screw type, and others, many of which are not intended for coaxial or shielded cable connection. Therefore a universal coupling adapter is needed by which the isolation pads may be connected through

Fig. 2: Measuring circuit consists of r-f sine source, coax line, isolation pads and receiver



50 ohm coaxial lines to the filter under test with no discontinuity in the line up to the point at which the central conductor makes contact with the filter terminal.

One design for a universal coupling adapter found to be satisfactory is sketched in Fig. 3. In this arrangement, the adapter sleeve is drawn up tightly against the filter housing so that the knife edge makes good circumferential contact with the container in a line surrounding the base of the terminal. The 50 ohm line insert is then screwed into the adapter sleeve until the central conductor makes contact with the end of the filter terminal. The other end of the 50 ohm insert is threaded and dimensioned to receive a standard 50 ohm cable connector by which the insert is connected through a length of cable to the isolation pad.

### Coupling Arrangement

A coupling arrangement of this type is adaptable enough to accommodate a large number of different sizes and types of filter terminals, and with slight modification, it could be made to fit almost any conceivable type of terminal, large or small. Also it fulfills the necessary requirement of carrying the 50 ohm coaxial line from the isolation pad directly up to the end of the filter terminal, and it provides for grounding the outer conductor of the coaxial line to the container such that the filter unit itself, including its terminals, becomes part of the coaxial transmission system.

The mechanical means by which the adapter sleeve is held tightly against the filter container is not critical and the method suggested in the sketch may not be practical in every case. It may be found preferable to secure the filter firmly to a base plate and push the adapter sleeve up against the filter by means of a suitable clamping arrangement.

### Accuracy of Measurement

The overall accuracy of measurement data obtained by this method is dependent upon a number of factors each of which, with reasonable care, may be controlled within fairly close limits. The principal source of high frequency error has been found to be a frequency characteristic of impedance looking back toward the isolation pads from the filter under test, caused either by a frequency characteristic of the pads themselves or by an impedance mismatch between pads and connecting lines, but generally a combination of both. However, if the VSWR of the pads

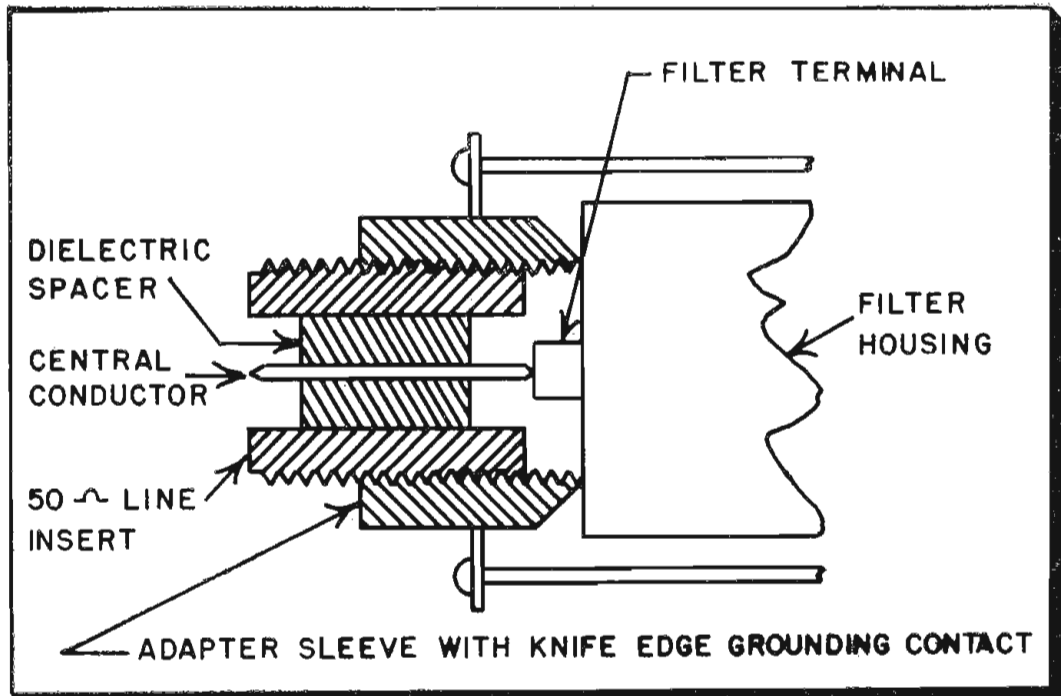


Fig. 3: Universal coupling adapter. Line impedance is function of sleeve ID and terminal OD

is held to no more than 1.2 out to 1000 mc for pads which are 50 ohms at dc, and if the characteristic impedance of the connecting lines is exactly 50 ohms, the maximum impedance change seen by the filter under test would be approximately 20%. This means, at the worst, a measurement error of no more than 1.6 db.

Inaccuracy of calibration of the

signal generator attenuator is another possible source of error, although the magnitude of this error is generally insignificantly small for good inductive type attenuators working at signal levels below approximately 6 db from maximum output.

When relatively high output from the signal generator together with  
(Continued on page 182)

### "BEEP PILOTS" CHECK ROBOT CONTROLS ON JET



Robot controls on Lockheed QF-80 pilotless jet get pre-flight test by "beep pilots." The controls, produced by Sperry Gyroscope for the Air Force, receive beep-box radar or radar signals from two ground stations or director plane. Craft is being used in atomic bomb tests at Nevada Proving Grounds

# A New Wide-Angle Microwave

**Superior performance of parabolic torus compared to paraboloid type is evident in X-Use as beam-bender in microwave relays foreseen. Ability to handle multiple beams**



By  
**K. S. KELLEHER**  
Naval Research Lab.  
Washington 25, D.C.

**A**LL of the microwave-optic solutions considered up to the present time for sweeping a beam through a plane in space can be placed in two categories. They have either symmetry, or what might be called partial symmetry. Two cases are given in Fig. 1. Full symmetry exists for the concentric lens type (a) while partial symmetry is found

in the Schmidt lens type (b). In this second case, the reflector is symmetrical, but the correcting lens is not. It is evident that, if the system is arranged to produce the desired beam for the feed at position A, it will produce the same type of beam when the feed is rotated to point B.

After considerable work on both systems, the Schmidt type has, at the present time, been shown to be superior.<sup>1</sup> The possession of symmetry is not a guarantee of success. The fundamental problem in the symmetrical system is to produce a beam with good characteristics for any feed position, and it is difficult to obtain perfect optical cross section when one insists on symmetrical components. One solution with symmetry and perfect optics which does exist—the Luneberg Lens<sup>2</sup>—is valu-

able for certain problems, but has limitations.

The solution described here consists of a reflector without correcting lens and yet has symmetry with respect to the plane of scan. The reflector surface is generated by rotating an arc of a parabola about a line parallel to the latus rectum, as shown in Fig. 2. The feed horn for this system, also shown in the figure, is positioned at the focal point of the parabola. Only one-half of the parabolic curve is used in this case in order to prevent reflected radiation from striking the feed system.

Since the surface was formed by rotating the arc about the line AB, it is reasonable to expect no change in performance as the feed is rotated about that line. If it were possible to produce, from this reflector, a plane

Fig. 1: Symmetrical lenses: (a) Concentric and (b) Schmidt

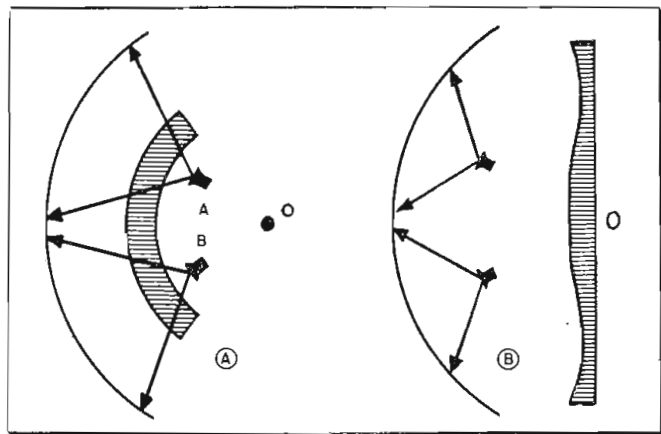


Fig. 2: Parabolic torus reflector has symmetry without lens

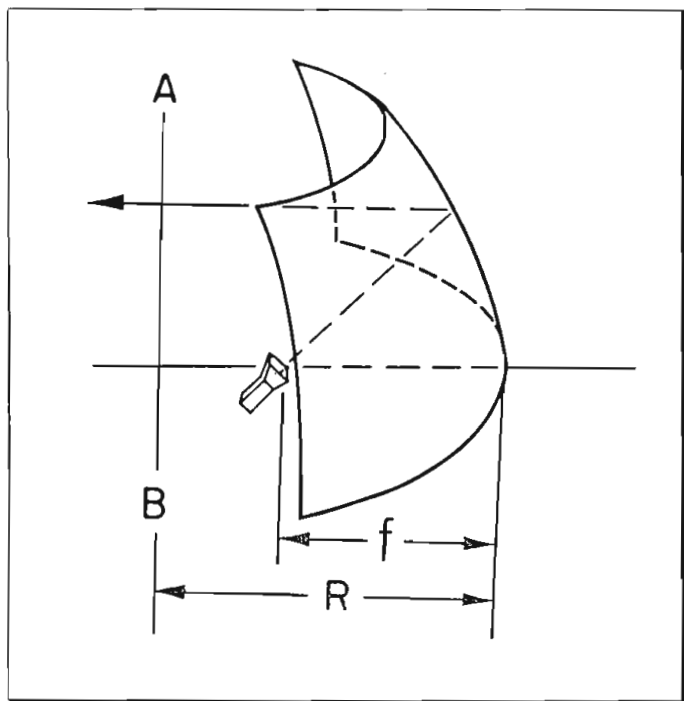
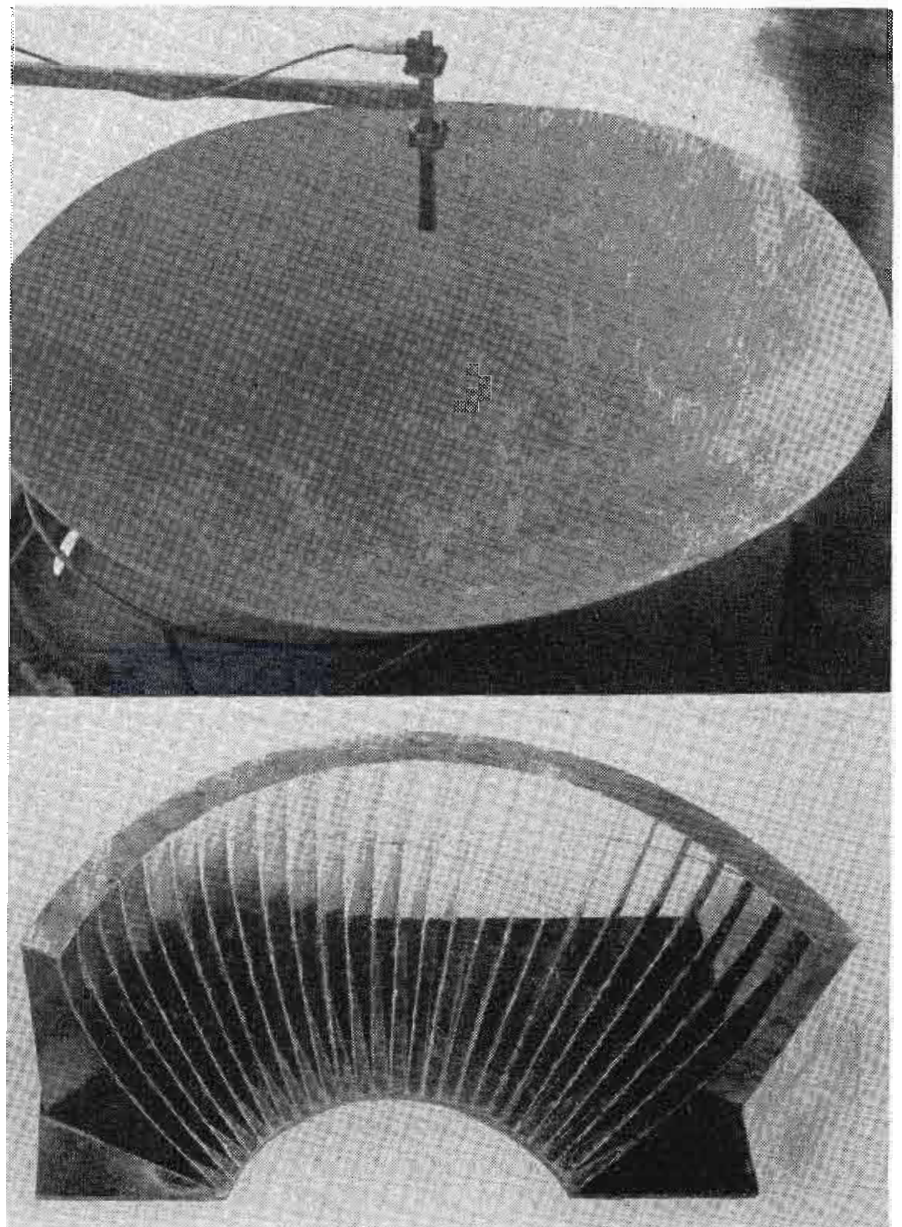


Fig. 3: Photographs of two types of parabolic torus reflectors



# Reflector

## band scanning applications. indicates unit's economy

wavefront at any one feed position, the same characteristic could be obtained at other positions. It is well known that the only reflector which converts a spherical wave into a plane wave is the paraboloid, which has been found to be inadequate for wide-angle scanning.<sup>3</sup> However, it is reasonable to expect that a wavefront which closely approaches a plane would produce a pattern with good characteristics. It can be shown that a proper choice of the values of the focal length and reflector radius,  $f$  and  $R$  in Fig. 2, will yield a surface which has a nearly plane reflected wavefront.

### Reflector Types

There are two general types of parabolic torus reflectors. The first is obtained from a rotation of the parabolic arc through about  $120^\circ$  to  $180^\circ$  and is used whenever feed motion through angles as much as  $90^\circ$  is desired. In this case only a portion of the reflector is illuminated at any one time. The second type of torus employs a rotation of the parabolic arc through  $60^\circ$  to  $80^\circ$ . The entire reflector is illuminated at all times and so is used efficiently. The angle of scan in this case is limited by the increase in "coma" lobe in a manner similar to that found for the paraboloid and sphere.

Fig. 3 shows photographs of the two reflector types. In both cases, the parabolic arc has been rotated

about a horizontal axis. In the case of the fabricated reflector, each screen support member takes the shape of the parabolic arc. This reflector has a rotation angle of  $130^\circ$  while the fiberglass reflector has an angle of  $86^\circ$ .

The wide-angle reflector shown in Fig. 3 has a focal length of 9 in. and a radius of 19.6 in. ( $f/R = 0.46$ ). Patterns obtained at X-band from this reflector are shown in Fig. 4 where they are compared to patterns from a paraboloid. It is evident that the parabolic torus is far superior to the paraboloid as a scanning reflector. The decrease in gain at the position of  $40^\circ$  off center is due to the fact that for this position some fraction of the energy from the feed horn was not reflected by the torus. If greater coverage than the  $\pm 40^\circ$  shown here is required, the angle of rotation should be increased by a corresponding amount. For example, a  $90^\circ$  coverage would be obtained from a reflector whose rotation was  $140^\circ$ .

Besides the obvious application of this reflector as a wide-angle scanning antenna, it appears to be useful as a "beam bender" in a microwave link (Fig. 5). The present systems, which might be used for this purpose, consist of a plane reflector or of a reflector which is a section of a paraboloid. They appear to be limited either by the fact that the angle of bending is always  $90^\circ$  or that different sections of a paraboloid might be required in order to obtain different angles of bend. With a parabolic torus reflector and two feed horns, the angle of bending can be made arbitrary. The angle between the incident and reflected beam is equal to the angle formed between the feed horn axes. It is not necessary that the mounting struc-

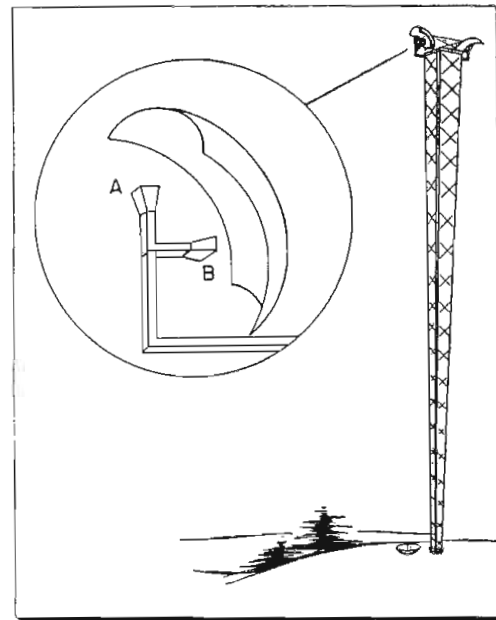


Fig. 5: Reflector used as microwave beam-bender.

ture for this reflector be behind the surface as shown in the figure. A better mechanical system would be had if a half torus reflector were used and the mounting structure placed in the vicinity of the feed horns.

### Second Application

A second application is found when it is desired that a single control station should communicate with several substations. The parabolic torus would be mounted so that its circular section was in the horizontal plane. The several feed horns, corresponding to the several substations, would be mounted at proper positions in that plane. Through this means, a group of reflectors is replaced by a single reflector with a group of feeds.

The medium-angle (fiberglass) reflector of Fig. 3 has a focal length of 13 in. and a radius of 29 in. ( $f/R =$   
(Continued on page 168)

Fig. 4: Patterns of wide-angle parabolic torus taken at X-band

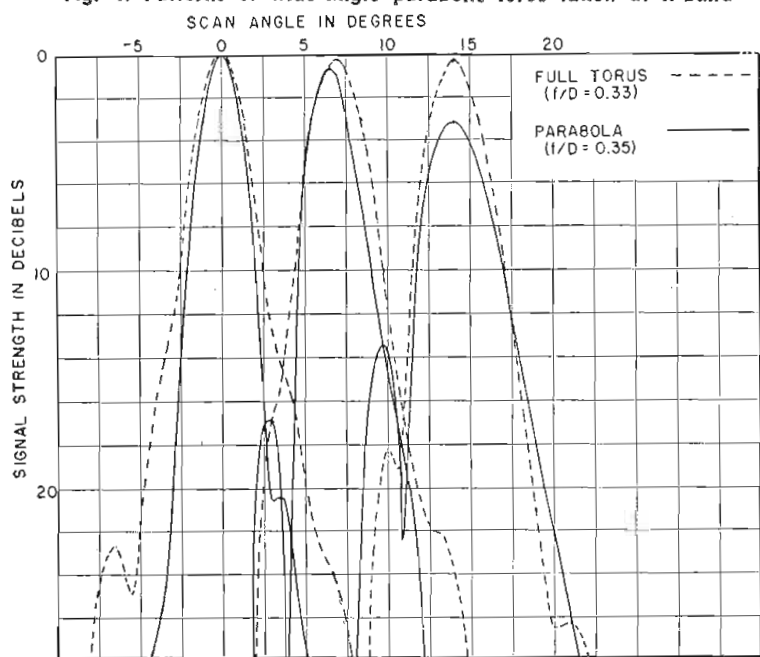
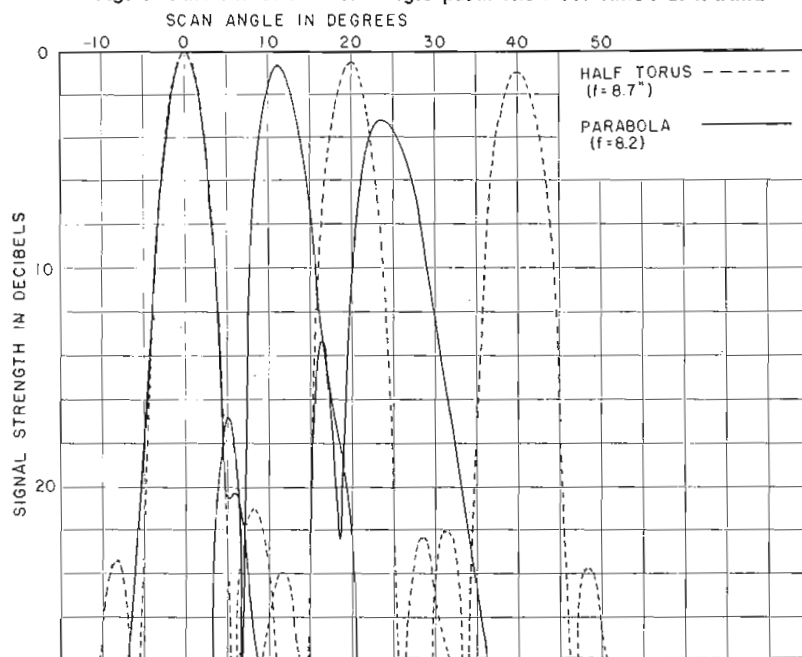


Fig. 6: Patterns of medium-angle parabolic torus taken at X-band



# Contrast in Cathode Ray

Faceplate transmission and reflection, optical contact of phosphor are controlling contrast obtained on 66% transmission faceplate. Detail contrast half that measured

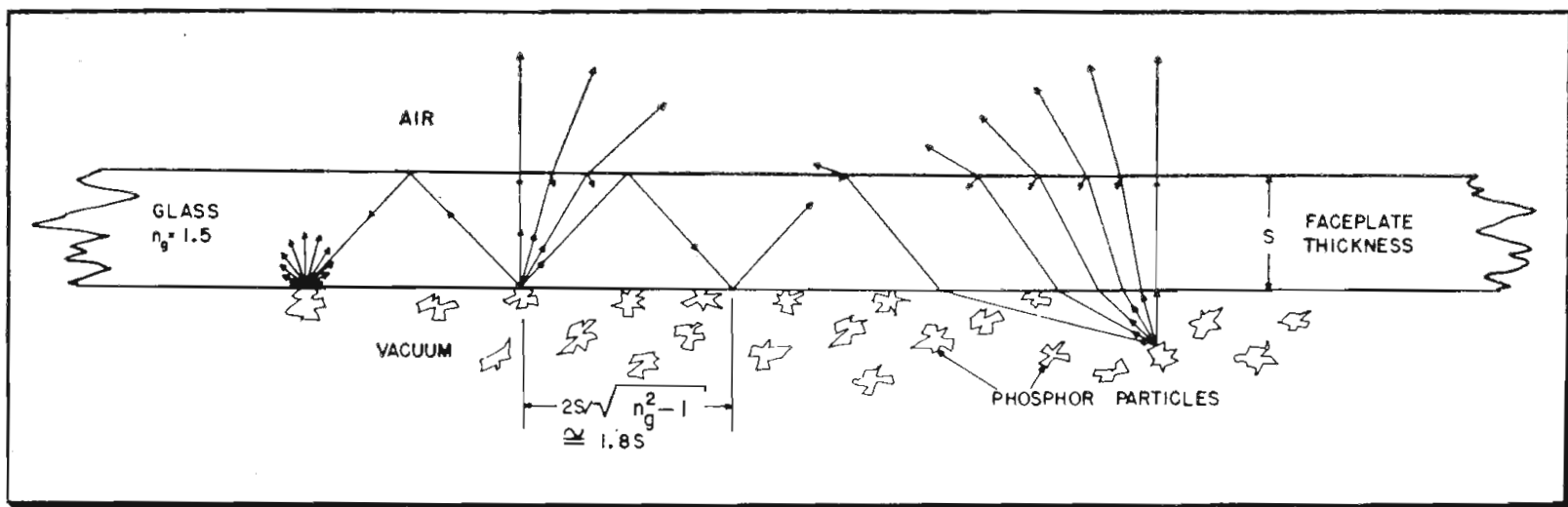


Fig. 1: Ray-tracing in CRT faceplate cross-section shows light from phosphor reflected at glass-to-air interface

By **Jesse H. Haines**  
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Passaic, N. J.

**I**F a substantial area of a cathode-ray tube is scanned, and a stationary pattern is generated by turning the beam completely "on" or "off," it will be observed that in those areas corresponding to the "off" beam there is, nevertheless, a certain brightness of the raster and the dark area. The contrast is not infinite, as it should be, but it has a finite value.

A number of factors degrade contrast in cathode-ray tube images. The principal source external to the tube itself is the ambient room illumination. Because of the straightforward equations involved, it need not be further discussed here.

Of those sources of contrast degradation inherent in the CRT cathode-ray tube design itself, only a few are electronic in nature. These include stray electrons from the gun and secondary emission from the phosphor. In modern CRT designs, these effects are negligible.

The chief contrast degrading factors are, in increasing order of importance, internal bulb-wall reflections, screen curvature, normal reflections and halation. These are wholly optical in nature and may be related to the various optical parameters of the CRT. All these factors were studied in detail by R. R. Law.<sup>1</sup> By making certain shrewd observations concerning the optical and

photometric nature of light emission in the tube, Law developed theories and equations which allowed computations to be made for the effects of screen curvature, normal reflection, and halation. To arrive at these equations, it was necessary to employ both simplifying assumptions and a simplified geometry for the contrast degrading factors. In particular, Law introduced the important concept of Detail Contrast. This is defined as the ratio of the brightness between an infinitely large, uniformly illuminated field and a small unexcited spot centered in this field. This is the worst possible small area contrast condition ever encountered.

### Contrast Equations

Law's equations check reasonably well with the experimental data, thus demonstrating their validity. However, the contrast equations for screen curvature, normal reflection, and halation all employed the simplified uniform field geometry of the Detail Contrast definition. Hence, the contrast degradation is caused by a sort of hazy "skin" stretched over the whole CRT face.

This article considers the contrast anatomy of small-area brightness configurations rather than the overall "skin" effect.

With typical tubes, the major amount of contrast degradation is determined by the optical parameters of the faceplate and the phosphor deposited on it. However, if the tube has a mirror-like metal backing on

the phosphor and is operated in a dark enclosure, then all the previously noted contrast degrading factors are eliminated except halation and normal reflection. Thus, our attention may be confined to these factors alone.

Of the light emitted toward the observer, a small amount is reflected at the glass-to-air interface, and is termed "Normal Reflection." This applies to all light rays which leave the phosphor and travel through the faceplate at less than a critical angle, as shown in Fig. 1.

The proportion reflected is determined by an equation due to Fresnel which, for the normal ray, simplifies to  $R = (\mu - 1) / (\mu + 1)$ .<sup>2</sup> This gives the usual 4% reflection found at all glass-to-air interfaces.

Note that while some phosphor particles are in optical contact with the faceplate and some are not, nevertheless, light from all these particles suffers the small amount of normal reflection at the glass-to-air interface. Note, too, that all the light entering the faceplate from the vacuum exits after being refracted according to Snell's law. However, for the light coming from the particles in optical contact a critical angle exists beyond which total reflection takes place; that is, the light is trapped on the faceplate.

This light trapping is an experimental fact. It is evidenced by halation rings, familiar to everyone. Since the glass index of CRT faceplates is always very close to 1.5, the critical angle is known. Hence, the first halation ring at about 1.8S



# Tubes

**trast variables. 100:1 de-  
at edge of uniform raster**

from the spot, where  $S$  is the face plate thickness.

It can be shown that, depending on the structure of the phosphor and the method of depositing it, the equivalent of usually 20 to 30% is in optical contact with the faceplate. Therefore, it is an interesting fact that *all* the halation comes *only* from phosphor in optical contact, but *almost all* the viewed brightness and the normal reflection comes from phosphor *not* in optical contact.

Another important fact is that the light is emitted in a nearly perfectly diffuse manner. This is readily deduced by noting that the CRT brightness does not vary appreciably with one's viewing position. Consequently, the relative intensity as a function of angle is known. In pho-



Fig. 2: Scanning spot, attendant halation rings and normal reflection

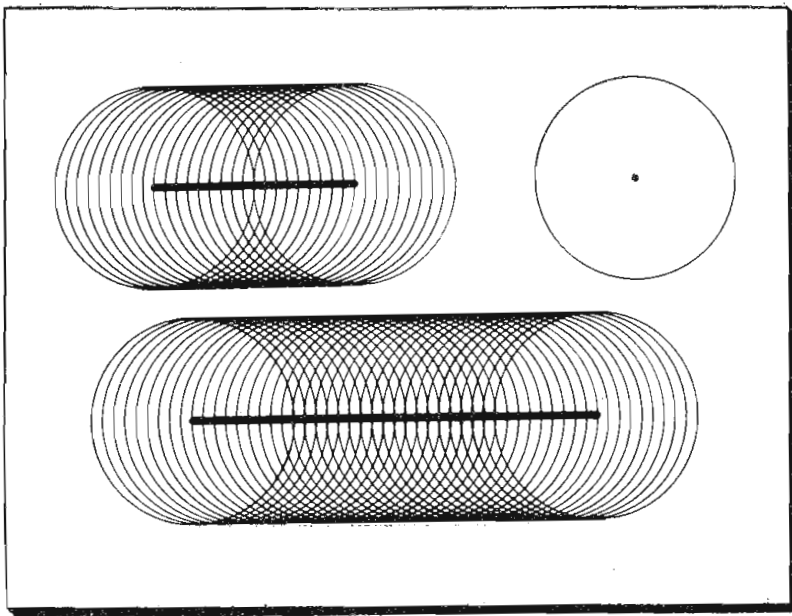


Fig. 3: Graphical construction of line halation

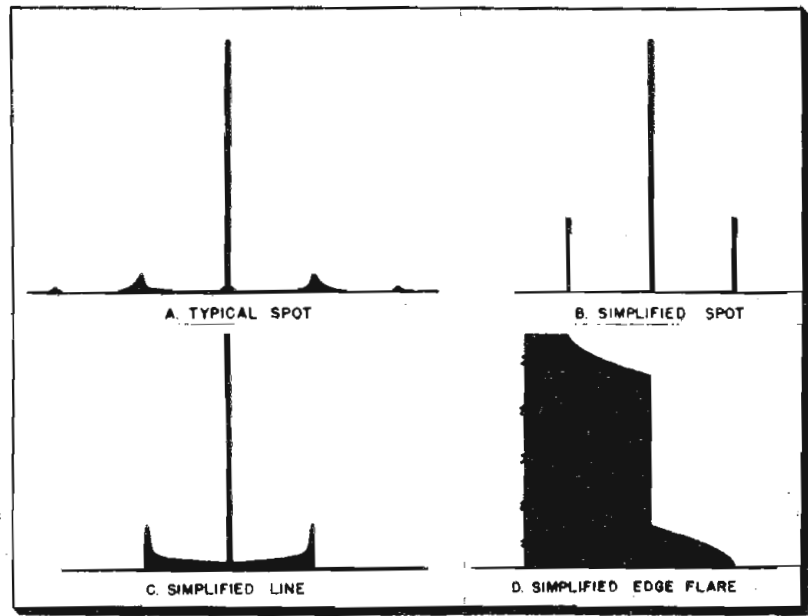
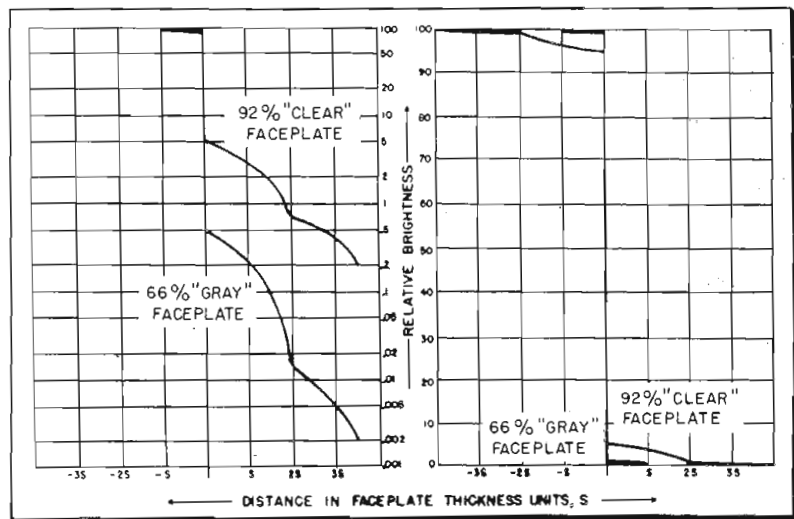
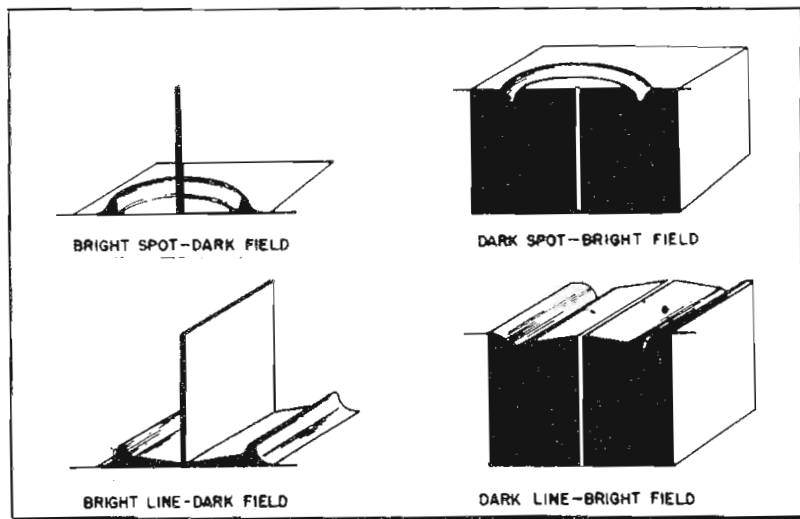


Fig. 4: Brightness cross sections (not to scale)

Fig. 5: Brightness cross sections (not to scale)

Fig. 6: Edge flare in CRT screen



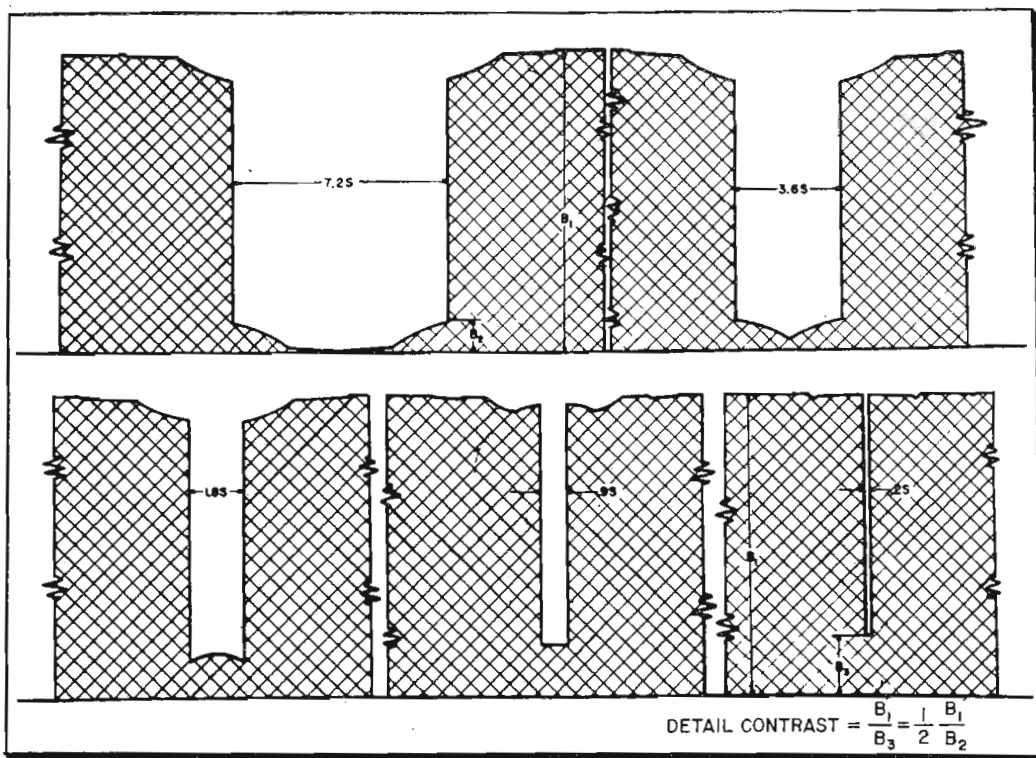


Fig. 7: Synthesis of halation lines from approaching fields with edge flare

tometry, this relation is known as Lambert's Law.

As can be seen from Fig. 1, the contrast allowed by inhalation and normal reflection is controlled by three variables:

1. Transmisison of faceplate.
2. Reflection factor of phosphor.
3. Optical contact of phosphor to faceplate.

The path of a light ray which forms halation rings may be traced in Fig. 1. As it leaves the illuminated spot in optical contact, the ray travels at the critical angle through the faceplate. After covering a path length of about 2.7S it arrives back at the glass-to-vacuum interface. The one ray shown encounters no phosphor particle in optical contact and so it again is completely reflected and continues on until it finally hits at phosphor particles. The other ray enters one of the few nearby phosphor particles in contact, and is reflected diffusely, as seen in Fig. 1. In addition to the optical contact factor, the halation ring brightness is thus further determined by the reflection factor of the phosphor. Since the halation rays have traveled a distance at least 2.7 faceplate thicknesses *further* than the directly viewed rays, the faceplate transmission obviously has a major effect on halation. Other rays travel even further. In typical tubes, it turns out that total halation brightness varies as well over the cube of the faceplate transmission. On the other hand, normal reflection varies with

a power only slightly higher than the square.

The effect of the phosphor reflection factor and optical contact are more nearly linear factors, over the range of interest.

Fig. 2 shows the basic anatomical element of the CRT image—the scanning spot, and its attendant halation rings and normal reflection.

Since the photograph pictures a clear faceplate tube, the normal reflection is small compared to halation and, thus, is not easily visible. In confirmation, note that there is little brightness between the spot and the first halation ring. Beyond the first ring, the other rings decrease rapidly in brightness.

#### Infinity of Spots

Next anatomical element is the line, which is formed from an infinity of spots whose halation rings summate as halation lines at the usual 1.8S intervals. Unfortunately, since the printing process cannot handle a sufficiently wide contrast range, a subterfuge is adopted to show graphically, in a crude manner, how the line grows. The spot is shown, Fig. 3, in a vastly simplified manner, with only one sharp halation ring. Next, the spot grows into a line. Note particularly that, whereas, there was no brightness between the spot and the halation ring, there is now increasing brightness out to the halation lines.

A large, uniformly bright field is formed by a number of adjacent scanning lines. Hence, the effects of

halation and normal reflection are found at the edge of a uniform field. Unfortunately, the anatomy of this contrast degradation is not nearly so distinctive as for the spot or line, nor is it possible to satisfactorily photograph.

Next, see Fig. 4. Sketch A indicates the cross-section of the brightness of a typical spot. Sketch B is much simplified. The first ring is pulse-shaped, while the higher order halation rings are neglected, as is all normal reflection. Sketch C shows the brightness cross-section of a line formed from Sketch B. The halation lines are evident as is the light filled in between them and the scanning line. Compare this with Fig. 3. Sketch D indicates the brightness cross-section at the edge of a uniform field. This, in turn, was computed from Sketch C.

#### Edge Flare Formation

In Fig. 4, the field may be visualized as growing from scanning lines moving progressively to the left of each other. Hence, the edge flare is formed by the summation of many curves as in Sketch C, moving to the left. The result is a curve which slopes rather smoothly to zero at 1.8S. This somewhat unspectacular result was obtained from the pulse-shaped cross-section of Sketch B. If the more rounded shape of a typical case, Sketch A, were used, the edge flare would not be much different. It can be appreciated that the slope shape is determined principally by the relatively uniform spill-in brightness rather than the halation line.

One unexpected result of the edge flare synthesis is the slope just inside the bright field, where one might intuitively expect a flat top. The explanation of this is most interesting, and will be explained shortly. Also, it might have been expected that the edge flare would be some sort of exponential decay curve. In actual fact, the brightness drops off with extreme abruptness to a definite value and then slopes off gradually.

#### Different Viewpoint

It is now advantageous to approach the subject from a somewhat different viewpoint. Recall that a large uniform field is grown from an infinity of scanning spots. Turning off the beam at just one spot produces a dark spot. Turning the spot back on again, the field is again of perfectly uniform brightness. Now, knowing that the spot must have halation rings, it necessarily fol-

(Continued on page 179)

# Feedback Amplifiers with Stabilized Output Impedances

More stable damping and termination of load equipment now possible with amplifiers incorporating combined current and voltage feedback. Applications include drivers for recording meters, distribution systems, transmission lines and loudspeakers

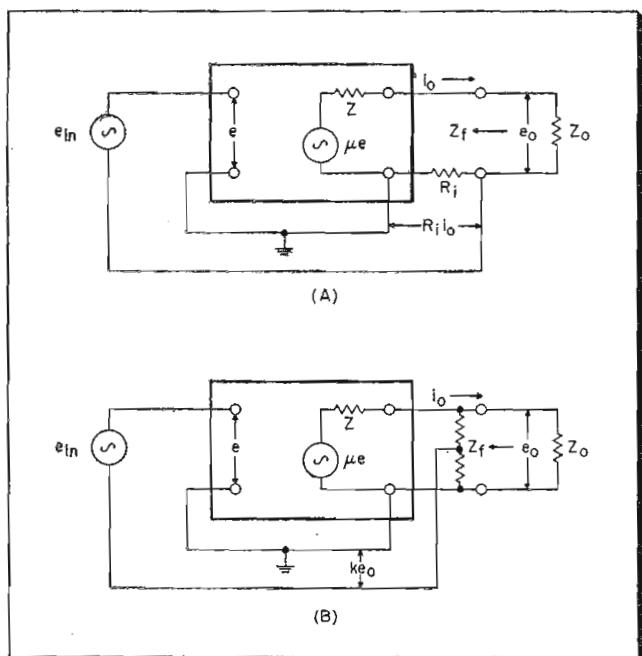


Fig. 1: (a) Simple current feedback amplifier, and (b) amplifier with simple voltage feedback. Impedance is function of gain

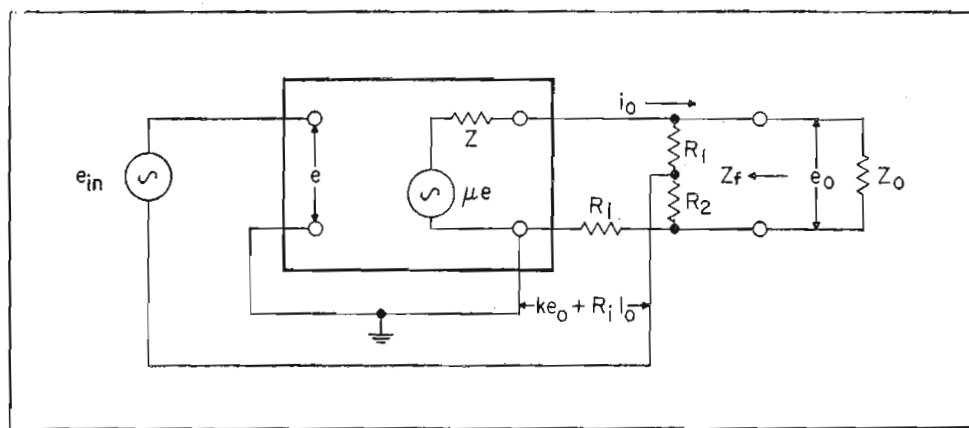


Fig. 2: Amplifier with combined current feedback and voltage feedback

By NORRIS C. HEKIMIAN

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WHEN the output impedance of an amplifier is changed by the use of either simple current or voltage feedback, the impedance becomes a function of the amplifier zero-feedback voltage gain. To reduce this dependence a system of combined current and voltage feedback may be used. Use of this method allows the relatively stable alteration of amplifier output impedance for applications where the feedback output impedance may be greater than, equal to, or less than the zero-feedback output impedance.

When the output impedance of an amplifier is altered through the use of feedback, the output impedance becomes dependent upon the zero feedback voltage gain of the amplifier; the greater the alteration made in output impedance by feedback, the greater is this dependence. Thus, although initially the amplifier may have had an output impedance totally independent of its voltage gain, by changing the output impedance through the use of feedback, the impedance now becomes dependent upon the unstabilized voltage gain of the zero feedback amplifier. Since the output im-

pedance is of importance, as would be supposed from the desire to change it to some particular value, it then is advisable to find means of reducing its dependence upon any unstable parameter such as the zero feedback amplifier voltage gain.

A method is presented here, together with a design procedure, for combining simple current and voltage feedback to reduce the dependence of the output impedance upon the zero feedback voltage gain of the amplifier. This method has allowed realization of a desired change in output impedance through the use of feedback with approximately a three-fold improvement in impedance stability compared to a simple voltage feedback arrangement yielding the same impedance change.

## Theory

The following discussion will be restricted to amplifiers with single inverse feedback loops from output to input terminals. It will be assumed that the application of feedback to a given amplifier does not alter the output impedance under

zero feedback conditions or cause any alteration of normal amplifier operation other than by the introduction of proper feedback voltages. In the notation to be adopted it should be noted that while, properly, complex quantities should be used in many instances, for simplicity only real quantities will be employed. Such simplification is generally permissible, especially for design-center conditions and where the networks have the simplicity assumed.

To simplify further discussion, the following symbols are adopted for use through the remainder of this paper.

$\mu$	Amplifier no-load voltage gain
$k$	Fraction of output voltage fed back
$R_i$	Load current sampling resistor, in ohms
$Z$	Amplifier output impedance without feedback, in ohms
$Z_f$	Amplifier output impedance with feedback, in ohms
$Z_o$	Load impedance, in ohms
$e_o$	Output developed across load, in volts

# FEEDBACK AMPLIFIERS (Continued)

- $i_o$  Load current in amperes
- $e$  Net effective input signal to amplifier, in volts
- $e_{in}$  Input signal, in volts
- $1 + B_i$  Amplifier voltage gain reduction factor for current feedback
- $1 + B_v$  Amplifier voltage gain reduction factor for voltage feedback
- $1 + B_o$  Amplifier voltage gain reduction factor for combined feedback

With reference to Fig. 1a, it can be shown from elementary analysis that the output impedance  $Z_f$  is given by

$$Z_f = (Z + R_i) \left( 1 - \frac{\mu R_i}{Z + R_i} \right) \quad (1)$$

From Eq. (1) it is seen that if current feedback is used to effect any substantial increase in output impedance,  $Z_f$  becomes almost directly proportional to the unstable quantity  $\mu$ , especially for impedance magnification factors of five or greater. It should be noted that the impedance with no feedback is  $Z + R_i$  and not just  $Z$  alone.

For the circuit of Fig. 1b it can be shown by similar analysis that the output impedance is given by, neglecting the loading of  $R_1 + R_2$ ,

$$Z_f = Z / (1 - \mu k) \quad (2)$$

Inspection of Eq. (2) shows that for large reductions in output impedance through the use of voltage feedback the output impedance is nearly inversely proportional to the unstable quantity  $\mu$ .

It should be possible to effect a stable change in output impedance of a feedback amplifier by combining the direct and inverse dependencies of output impedance, upon the unstable  $\mu$ . This can be accomplished by the circuit of Fig. 2. In this arrangement the feedback voltage appearing between the junction of  $R_1$  and  $R_2$  and ground is composed of current and voltage feedback potentials.

Neglecting the loading of  $R_1$  and  $R_2$ , the output impedance of the circuit of Fig. 2 can be shown to be,

$$Z_f = (Z + R_i) \left[ \frac{1 - \frac{\mu R_i}{Z + R_i}}{1 - \mu k} \right] \quad (3)$$

Inspection of Eq. (3) shows, considering the approximation, that if both  $-\mu R_i / (Z + R_i)$  and  $-\mu k$  are made much larger than unity,  $Z_f$  is independent of  $\mu$  and is given by

$$Z_f \cong R_i / k \quad (4)$$

Thus, it is possible to approach complete independence of output impedance of a feedback amplifier from the variations in  $\mu$ . Even values of only about three for the lesser of  $-\mu R_i / (R_i + Z)$  or  $-\mu k$  will result in substantially reducing the variation of  $Z_f$  with  $\mu$ .

Before proceeding, it will be advisable to pause and investigate the inferences to be drawn from Eqs. (1), (2), and (3). While the dependencies upon the unfeedback voltage gain  $\mu$  have been described, it should be observed that in all cases the output impedance with feedback is still

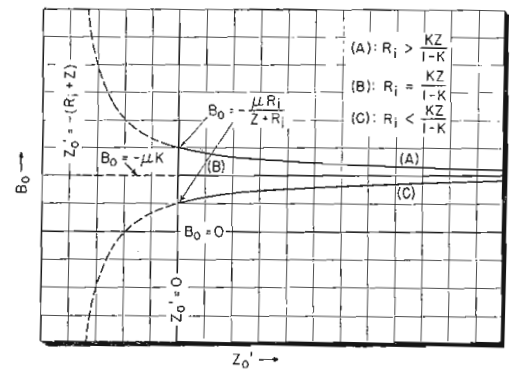


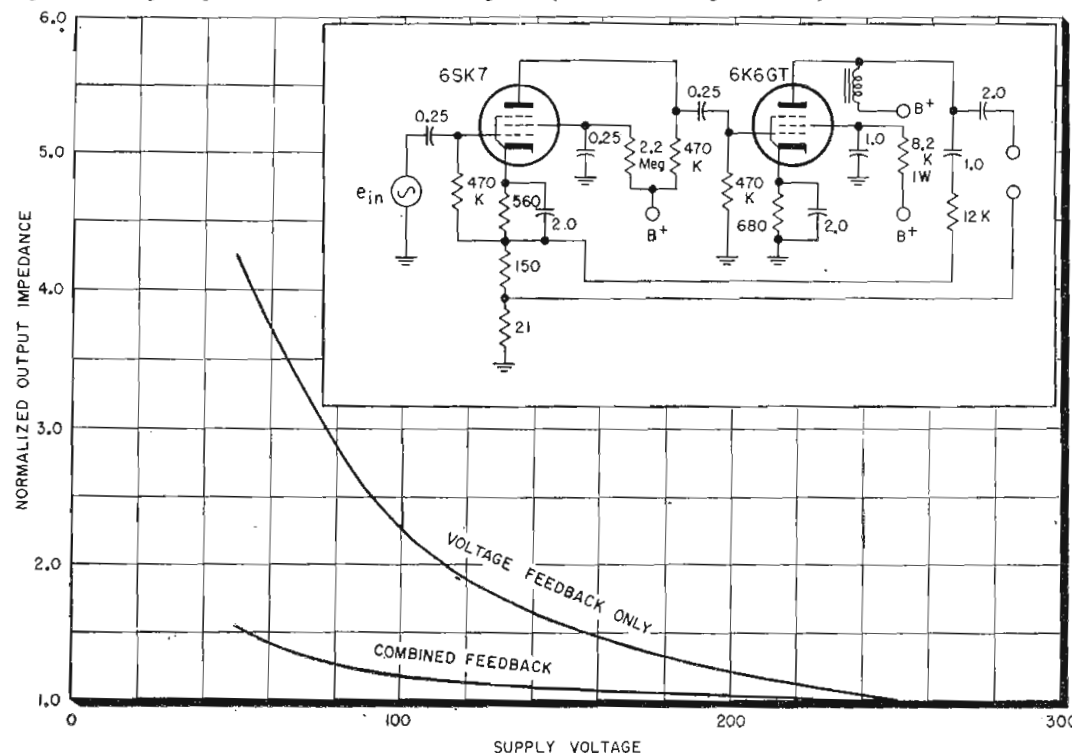
Fig. 3:  $B_o$  variations as a function of  $Z_o'$

a direct function of the output impedance without feedback. Thus, in each case, changes in output impedance with feedback may occur in instances where the zero feedback output impedance varies due to, say, changes in plate transformer saturation, changes in the plate resistance of the output tubes, and similar causes. It should be noted that changes in output impedance caused by zero feedback gain variations are inherently separate from those caused by variations in unfeedback output impedance, although often causes of changes in one result in changes of the other as well. As an example consider a simple triode amplifier as affected by aging of the tube. Generally, tube aging is manifested in increased plate resistance and lowered transconductance so that the amplification factor remains reasonably constant. In this case the output impedance with feedback changes because of zero feedback gain reduction and because of increased plate resistance of the tube.

As mentioned before, the system presented, in common with simple feedback arrangements, does not provide stabilization against variations in output impedance arising from variations in the zero feedback output impedance. It does, however, provide stabilization against variations in output impedance with feedback that arise from changes in the zero feedback voltage gain of the amplifier.

In view of the above discussion, it should be clear that the system presented is well suited for stabilization of output impedances of feedback amplifiers whose zero feedback output impedance is inherently stable, at least in comparison with probable voltage gain instability. Thus, pentode output stages, or triode output stages working into plate loads much less than the triode plate resistance, should readily lend themselves to the method presented in this paper. In these cases the output impedance of the zero feedback amplifier is generally determined by stable pas-

Fig. 4: Voltage-impedance curves of two-stage amplifier show high stability of combined feedback



sive elements and affected only slightly by unstable parameters such as the plate resistance of the output stage, although zero feedback gain variations are not suppressed. In the case of multistage amplifiers with overall feedback, the system presented is probably of greater value since anticipated zero feedback voltage gain variations are compounded by the additional stages with their associated gain variations, while the unfeedback output impedance is generally unaltered by cascading stages and retains the stability of a single stage.

A special case of Eq. (3) arises when  $R_i = kZ/(1 - k)$ . Substitution of this relation in Eq. (3) shows that for this case

$$Z_f = Z + R_i \quad (5)$$

Therefore, for the special case there is no alteration of output impedance by the application of feedback. Further, it should be noted that for this case the output impedance is totally independent of the gain  $\mu$ , although still a direct function of the zero feedback output impedance. Thus, it is possible to use this relation to design an amplifier with any desired amount of feedback but without any change in output impedance. This is substantially the technique used by Passman and Ward<sup>1</sup> in applying approximately 12 db of inverse feedback ( $1 + B_o = 4$ ) to a theater audio system without appreciable alteration of the output impedance of the amplifier.

Investigation of the condition of independence of  $Z_f$  from  $\mu$  shows that in general only negative feedback for both the voltage and current feedback portions will allow satisfaction of the approximations necessary. This arises from the fact that for positive, or regenerative, feedback the gain "reduction" factors are less than unity. However, it should be noted that special case cited in the preceding paragraph will still apply even when the assumed inequalities of the general case cannot be met. Thus it is possible to apply the special case to amplifiers with only small amounts of negative feedback or even positive feedback to prevent undesired changes in output impedance because of variations of  $\mu$ .

### Feedback Potential

Since, for the circuit presented, the total feedback potential is the sum of those arising from voltage and current feedback, the reduction in amplifier distortion, the decreased effects of power supply and heater variations, and many similar effects noted in negative feedback ampli-

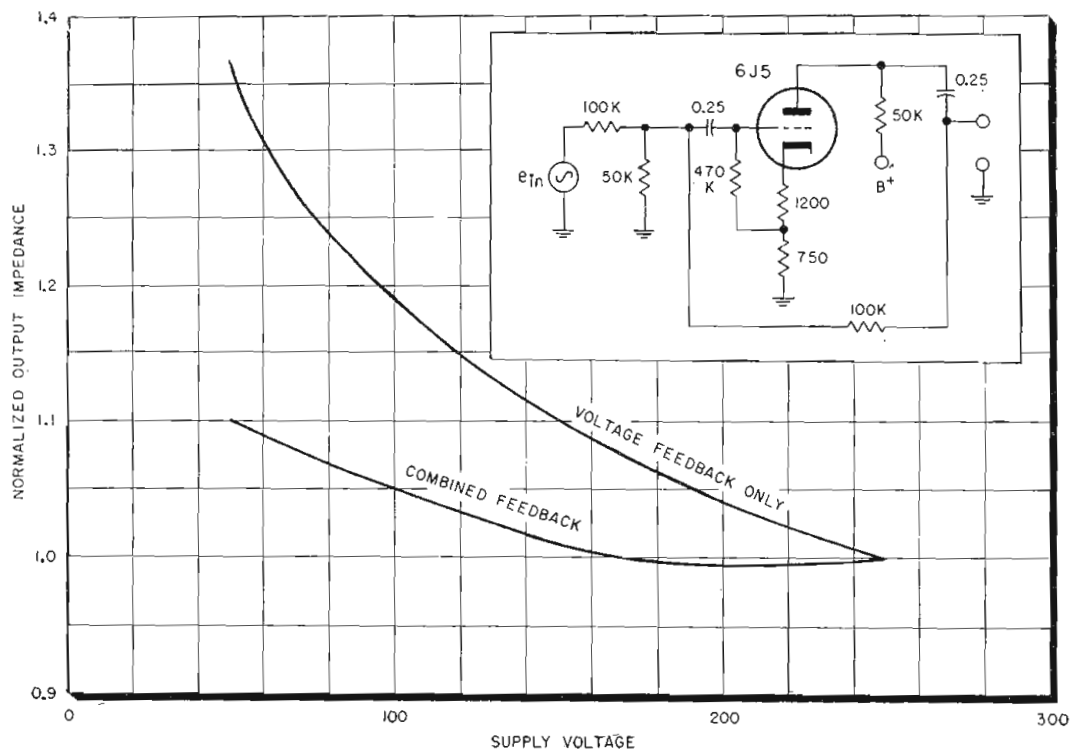


Fig. 5: Voltage-impedance curves of one-stage amplifier show reduced deviation with combined feedback

fiers are those corresponding to the total feedback factor  $1 + B_o$  as given by

$$1 + B_o = 1 + (B_i + B_v) \quad (6)$$

Similarly, the limitation on maximum allowable feedback ratio, as determined by susceptance to self-oscillation of the amplifier through the gain-phase shift criterion of Nyquist, is determined by the factor  $1 + B_o$  rather than by either of its constituent parts. Thus, if a particular amplifier has an estimated maximum allowable feedback of 25, this is a limiting value of  $1 + B_o$ .

### Design Procedure

Having determined a means of stabilizing the output impedance of a feedback amplifier it is now possible to develop a general design procedure. This procedure will be rather broad to allow widest possible application, and as a result considerable latitude is left to the individual designer and engineer. The parameters assumed to be given in the following procedure may not be those offered in any specific instance but in any event the design equations may be solved for the actual unknown quantities by elementary algebra.

It will be assumed that the following parameters are specified:  $Z_o$ ,  $Z$ ,  $Z_f$ ,  $\mu$ ,  $1 + B_o$ , and  $R_1 + R_2$ . Solutions for  $R_i$  and  $k$  will complete the general design.

From a simple analysis of the circuit of Fig. 2, the amplifier voltage gain reduction factor is found to be

$$1 + B_o = 1 - \frac{\mu Z_o''}{Z_o'' + Z + R_i} \left[ k + \frac{R_i}{Z_o''} \right] \quad (7)$$

where  $Z_o''$  is parallel combination of  $R_1 + R_2$  and  $Z_o$ . If the loading of  $R_1 + R_2$  cannot be neglected, it is necessary to employ new values of  $Z_o$  and  $Z_f$  denoted by  $Z_o'$  and  $Z_f'$  respectively and given by the following

$$Z_o' = \frac{(R_1 + R_2) Z_o}{Z_o + R_1 + R_2} \quad (8)$$

$$Z_f' = \frac{Z_f (R_1 + R_2)}{R_1 + R_2 - Z_f} \quad (9)$$

Using Eqs. (7) and (3) a solution can be found for  $R_i$

$$R_i = \frac{1 + B_o \left( 1 + \frac{Z}{Z_o'} \right) - \frac{Z}{Z_f'}}{\left( \frac{1 - \mu}{Z_f'} \right) - \left( \frac{\mu + B_o}{Z_o'} \right)} \quad (10)$$

Employing this value of  $R_i$  the following solution can be found for  $k$  from Eq. (3)

$$k = \frac{Z_f' - Z - R_i (1 - \mu)}{\mu Z_f'} \quad (11)$$

It is well to verify that for the general case both  $-\mu R_i / (R_i + Z)$  and  $-\mu k$  are both much larger than unity. For the special case it should be verified that  $R_i = kZ / (1 - k)$ . If these conditions are not satisfied for the general case, a compromise should be made in the assumed parameters, such as choosing a larger value of  $B_o$  and redesigning. Failure to verify the relations for the special case indicates an error in design or incompatible assumptions.

If operation with various load impedances is anticipated, it is advisable to investigate the effects of such changes in load impedance on the operation of the amplifier. In par-

(Continued on page 148)

# A Low-Noise Amplifier for 200 MC

Use of 416A microwave triode in telemetering applications gives over 10 to 1 improvement in noise performance over comparable receiving tube. Circuit details on insertion amplifier and timer for PPM-AM receiver given.

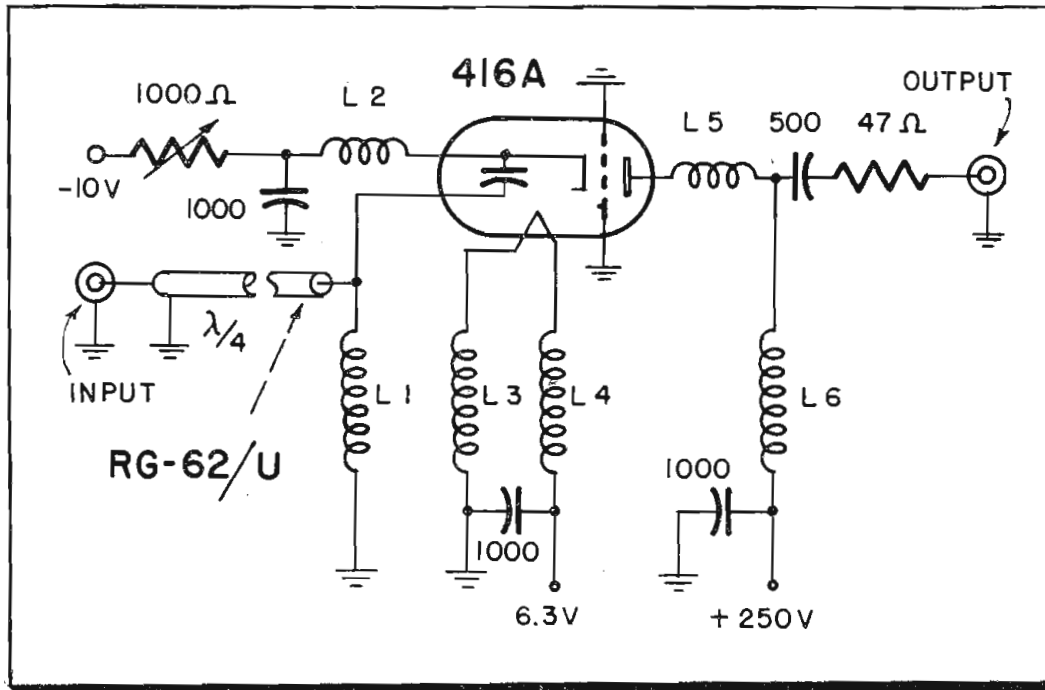


Fig. 1: Grounded grid insertion amplifier



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D. C.

THE telemetering ground stations used by the Naval Research Lab. at White Sands, N. M., in its upper-

atmosphere research program have been provided with high sensitivity receiving equipment by the use of a recently developed Western Electric microwave triode, the 416A, an outgrowth of Bell Tel. Labs.' 1553.<sup>1</sup> This tube, developed for use at 4000 mc, showed possibilities of significant improvement in noise figure over conventional tubes in the 227 mc telemetering band, and was consequently incorporated into two devices: an insertion amplifier, and a receiver tuning head.<sup>2, 3</sup>

The 416A<sup>4</sup> is characterized by exceedingly small element spacing

which results in high transconductance and low transit-time. A  $g_m$  of 50,000 micromhos is specified by the manufacturer at a plate current of 30 ma. The equivalent noise resistance ( $2.5/g_m$ ) is 50 ohms. An estimate of the transit-time input loading, deduced from Robertson's work<sup>5</sup> at 4000 mc, is 250 micromhos. The product of equivalent noise resistance and input conductance, a meaningful figure of merit for noise performance, is 0.0125. When this figure is compared to that of a triode-connected 6AK5, which is 0.19, the possibilities of the new tube become apparent.

## Plate Current Limited

In the present application the tube is not operated at optimum ratings because heat dissipation imposes a limitation of plate current to 15 ma. The  $g_m$  under this condition is approximately 30,000 micromhos, but the gain-bandwidth product remains quite high—about 480 mc. Large variations in plate current have been observed in different tubes with the same plate and grid voltages. Experience has shown, however, that performance is consistent for the same plate current, and a plate current stabilization scheme is therefore used. This consists of either grounding the cathode through a large resistor and applying a positive voltage to the grid, or grounding the

Fig. 2: Component layout in the amplifier

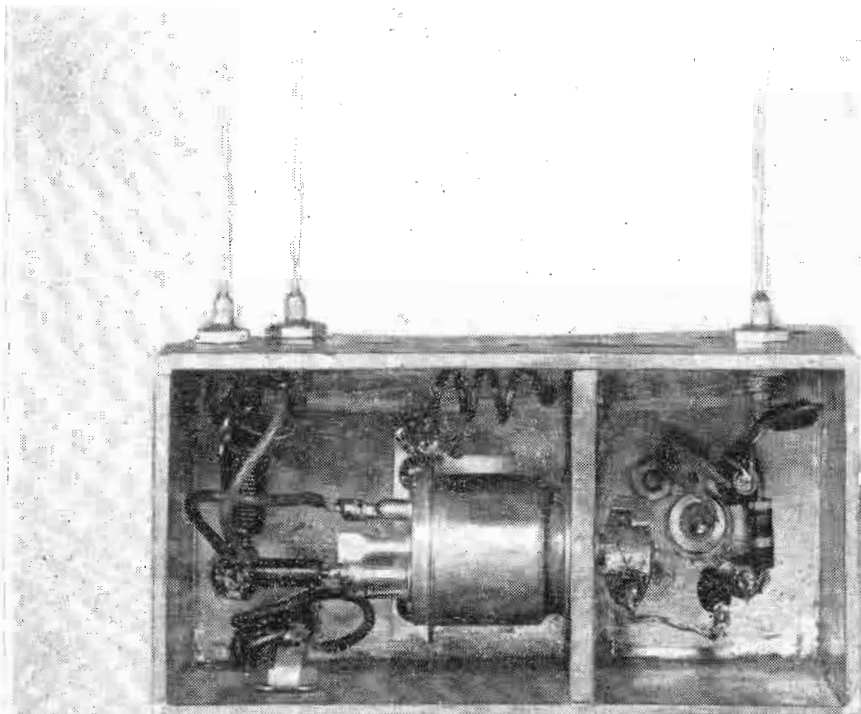
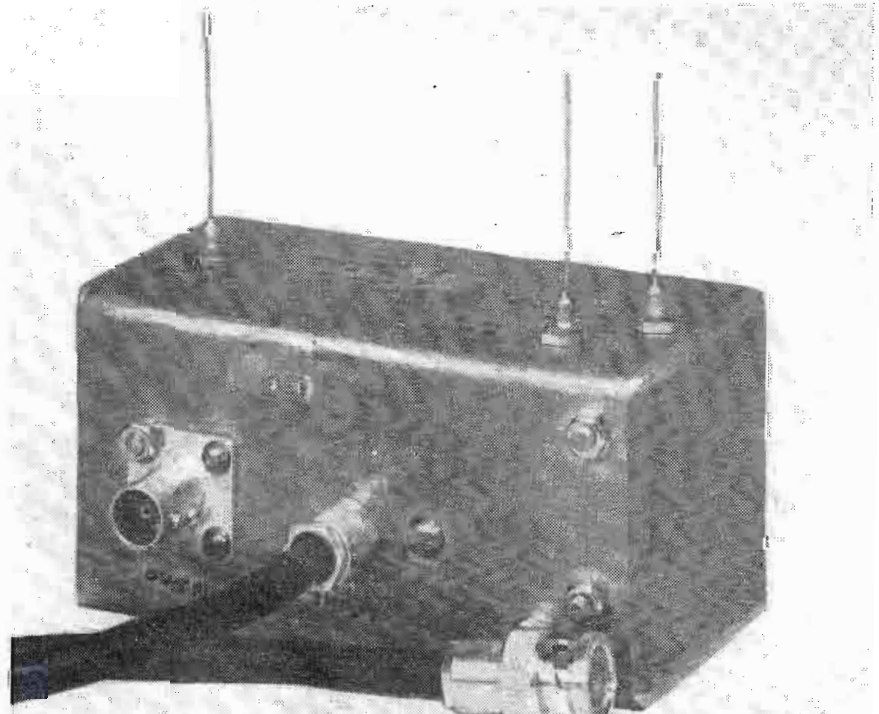


Fig. 3: Input-output side insertion amplifier



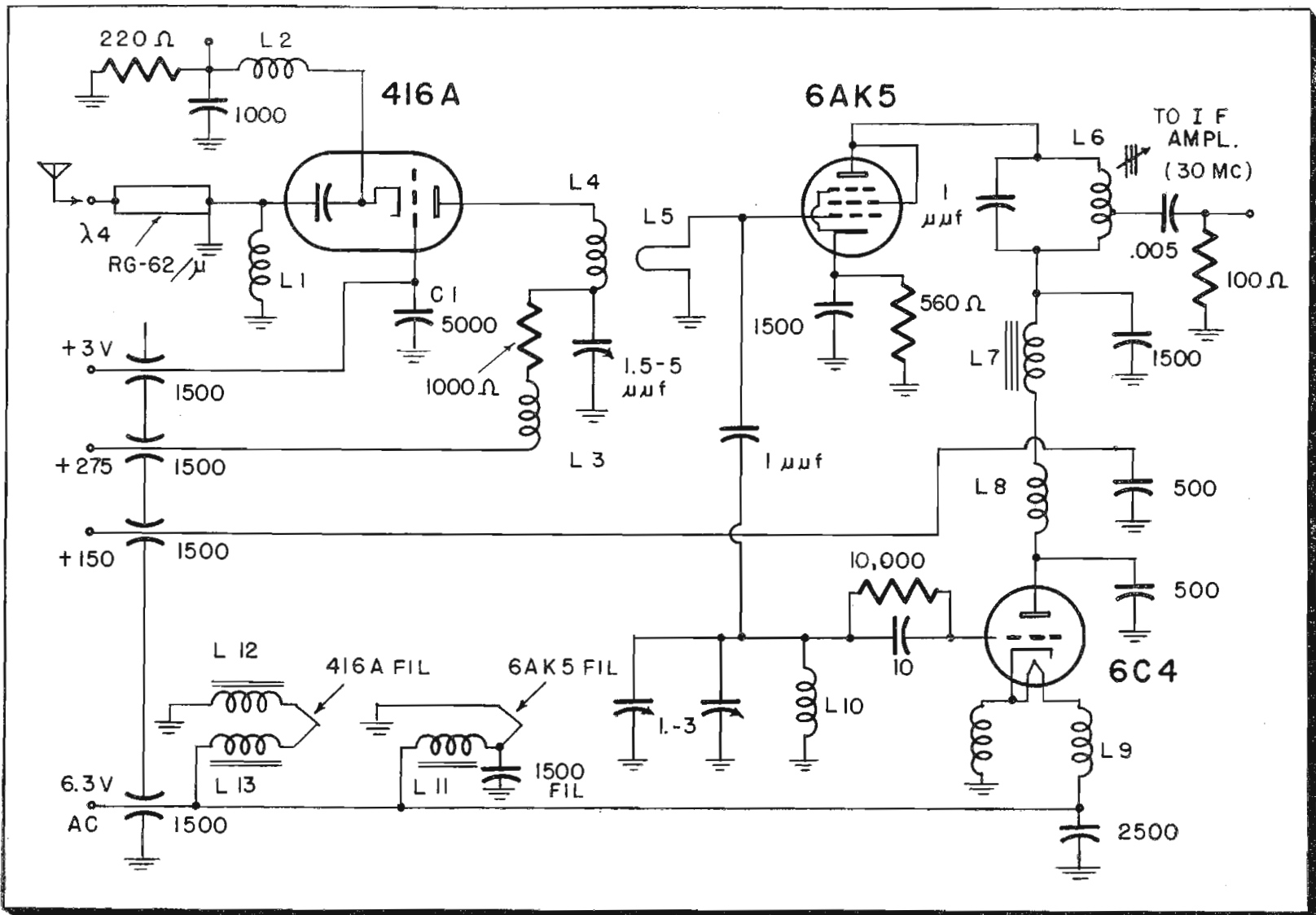


Fig. 4: Diagram of 220 MC r-f tuner

grid and applying a negative voltage to the cathode through a large resistor. Tube bias under these conditions runs from negative 0.1 to 0.3 volts for a 15 ma plate current using a plate voltage of 250.

A drawback to the use of the tube at low frequencies is its built-in cathode series capacitor of only 40  $\mu\text{mf}$ , a reactance of about 20 ohms at 200 mc. This small value of bypass capacity defeated attempts to utilize

a grounded cathode circuit. It was difficult to ground the cathode and the circuit tended to oscillate as a Colpitts circuit. The grounded-grid configuration is quite stable, and in addition, offers the possibility of introducing series inductance in the cathode input network to cancel some of the built-in capacitive reactance. For these reasons, several grounded grid amplifiers were designed and tested. The typical design,

shown in Fig. 1, is an insertion device, intended to operate from a 50 ohm source and to present an output impedance of 50 ohms at band-center frequency. It can therefore be inserted between a generator and a receiver without disturbing the degree of match to the generator or the noise figure of the receiver; thereby facilitating measurements. The output impedance of 50 ohms is obtained  
(Continued on page 166)

Fig. 5: Tuner component layout

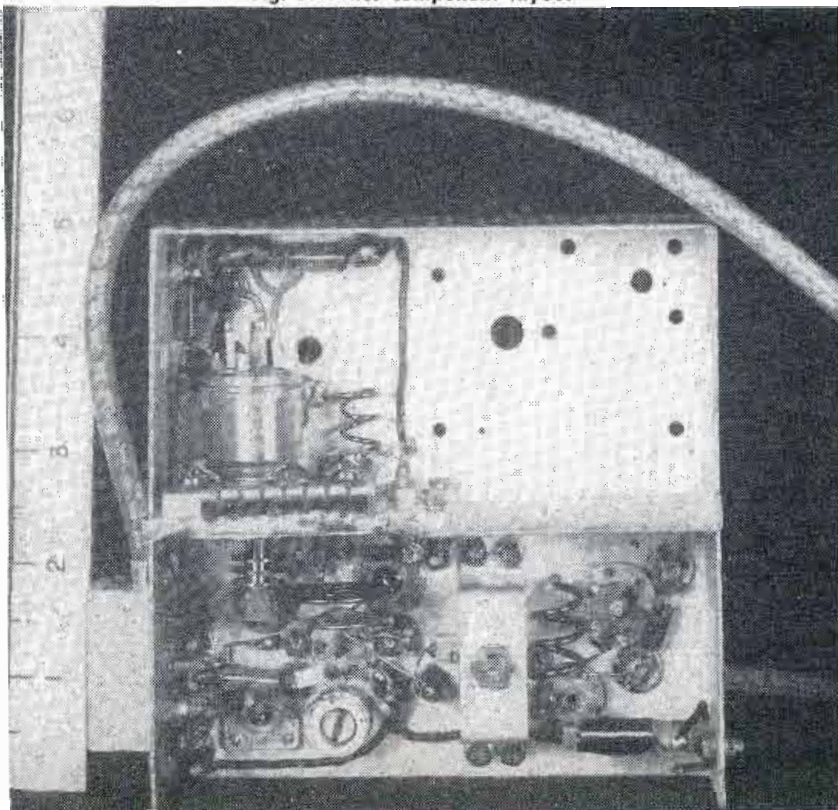
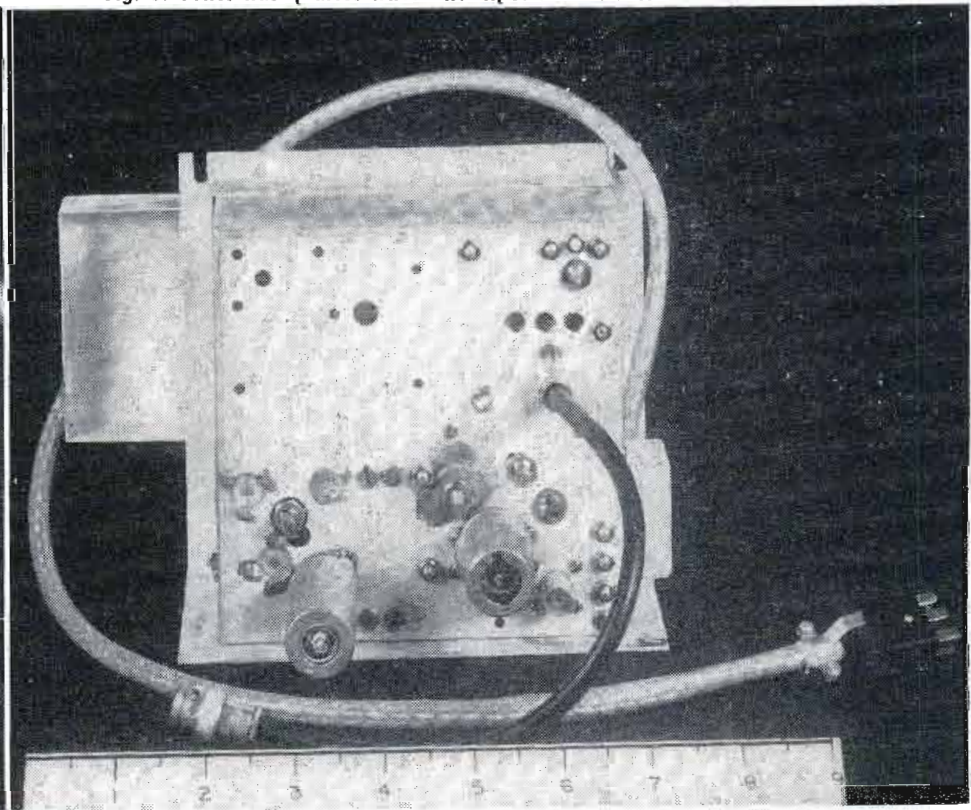


Fig. 6: Tuner has quarter-wave-line input transformer



# High-Efficiency 90° Cathode-Ray Sweep

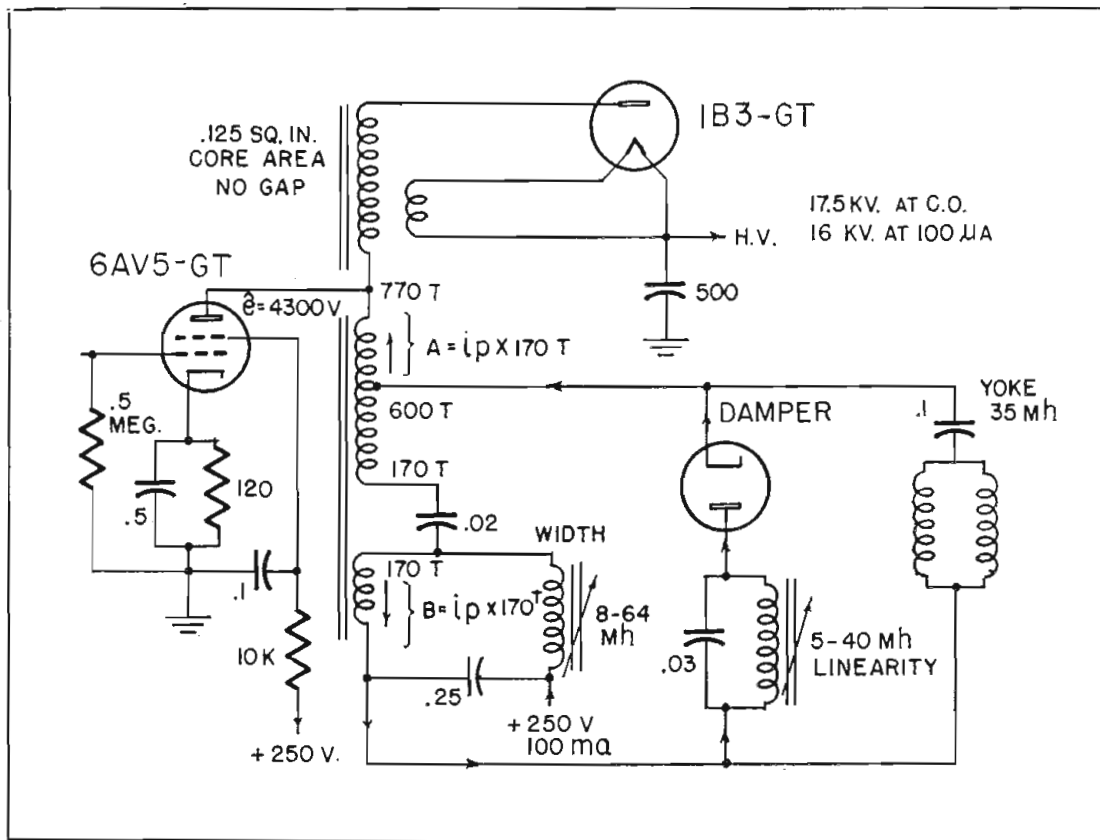


Fig. 1: Horizontal sweep circuit for 90° TV picture tubes accomplishes desaturation of the sweep transformer core to develop full impedance for fewer turns in winding

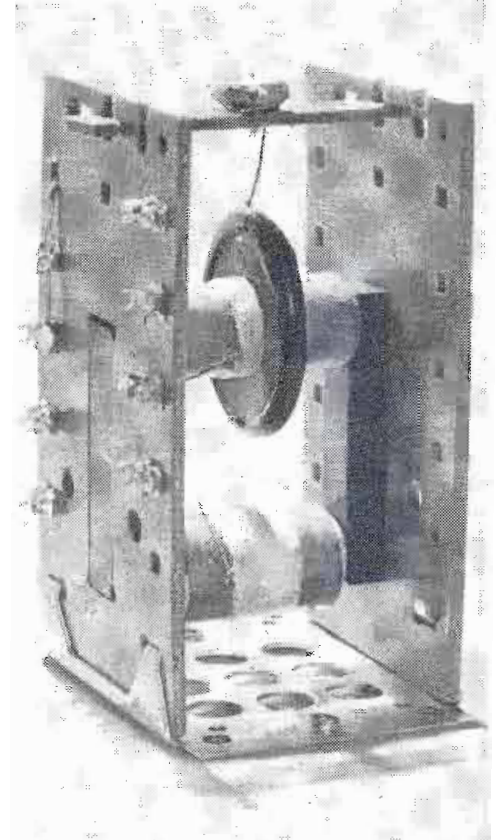


Fig. 2: 90° transformer with 1/8 sq. in. core for 6AV5-GT and 1B3-GT produces 17 kv

## New horizontal sweep design for wide-angle 27-inch TV picture tubes use less power than present 70° systems. Automatic desaturation of transformer core discussed

By C. E. TORSCH, General Electric Co., Syracuse, N. Y.

A new cathode-ray sweep system for 90°, large screen picture tubes has been developed to a high standard of operating efficiency with economy of materials, power intake, and tubes.

This system fully sweeps the 27 EP4 (aluminized screen, 90° all-glass, rectangular picture tube) operated at 17 KV anode potential. The power intake from a 250 volt B supply is 25 watts for horizontal, 5.2 watts for vertical sweep, with a single high voltage rectifier providing the picture tube anode supply. A single 6AV5-GT driver is used for horizontal, a 6W6-GT for vertical sweep; all picture tube and driver tube JETEC limit ratings are observed.

The 10 in. television receiver of 1949, which ushered in the ferrite cored horizontal sweep transformer, represented a relatively high level of

operating efficiency at that time, consuming 25 watts for horizontal, 5 watts for vertical sweep at 10 KV., from a 250 volt B supply. Without changing the required 50° sweep angle, we can, in retrospect, extrapolate the old system's performance for 17 KV. anode operation to evaluate the new 90° system performance. With the original yoke retained, 17 KV., 50° sweep would have taken 30% more ampere-turn excitation (yoke current requirements vary directly as the square root of the picture tube accelerating potential). This 30% increase in yoke current in the original impedance would have required 30% more yoke voltage. Assuming unchanged system efficiency, the old sets would thus have taken 42.5 watts for horizontal, 8.5 watts for vertical sweep for the original screen coverage, but at 17 KV.

Present day commercial 70° sweep systems consume 26 watts for horizontal, 6 watts for vertical sweep. Thus, it can now be demonstrated, on a given chassis designed for either 50° or 70° sweep, a change to new circuitry and parts will permit the original 250 volt power supply and driver tubes to deliver 90° sweep at the original anode voltage for the same or less power input.

This result has been made possible by a coordinated development of picture tube contour, circuit, yoke and matching transformers. Isolation and measurement of various sweep system power losses has progressed through improvements upon the electronic wattmeter.<sup>1</sup> Means for analyzing the exact driver tube plate current wave in autotransformer coupled circuits have been combined with the wattmeter.

### Wide Angle Sweep Limitations

Previous limitations on wide angle sweep included inadequate depth of focus on the picture tube screen and insulation difficulties in yokes and sweep transformers (occasioned by excessive core and copper losses in conventional magnetic designs).

Inadvertent saturation of the sweep transformer core was common in early developments. Extensive improvements in 70° sweep yokes<sup>2</sup>



# System

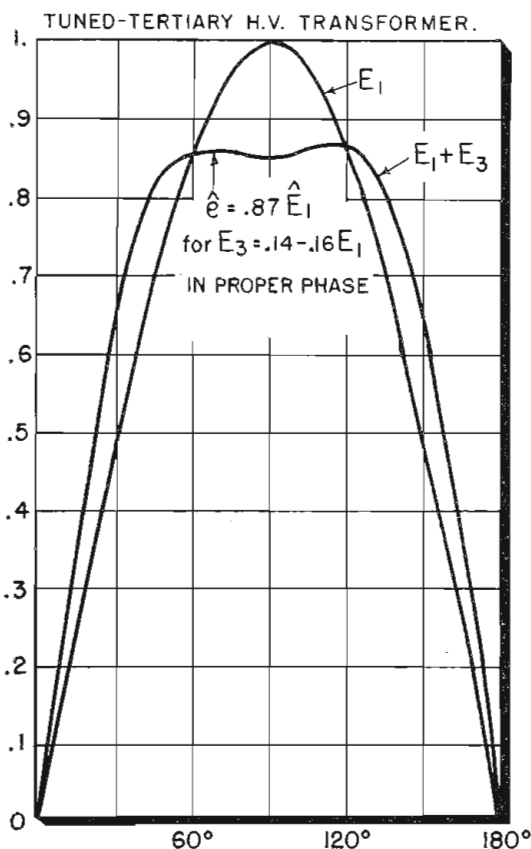


Fig. 3: Synthesis of squared wave of driver tube plate voltage from fundamental sine loop

and driving circuits benefited the 90° development. Conversely, overcoming certain difficulties in the 90° system carried improvements over into later 70° systems.

## New 90° Core Considerations

One basic output stage improvement is removal of the dc component of core flux in the horizontal sweep output transformer. One such (Fig. 1) accomplishes autotransformer desaturation automatically. In this arrangement, no gap papers are inserted in the core joints, and full impedance is developed for fewer turns in a given section of the windings as a result. A procedure for setting up this automatic desaturation is outlined below.

(1) Establish the sweep transformer stepdown ratio from driver-to-damper by considerations of sweep system effective "Q" and desired sweep linearity.

(2) Set reactance of yoke-loaded secondary at least eight times as high as connected yoke reactance<sup>3</sup> at operating flux levels.

(3) Set driver-to-yoke stepdown ratio by considerations of driver tube surge voltage and current limitations.

(4) Insulate yoke with coupling capacitor producing proper center expansion of sweep.

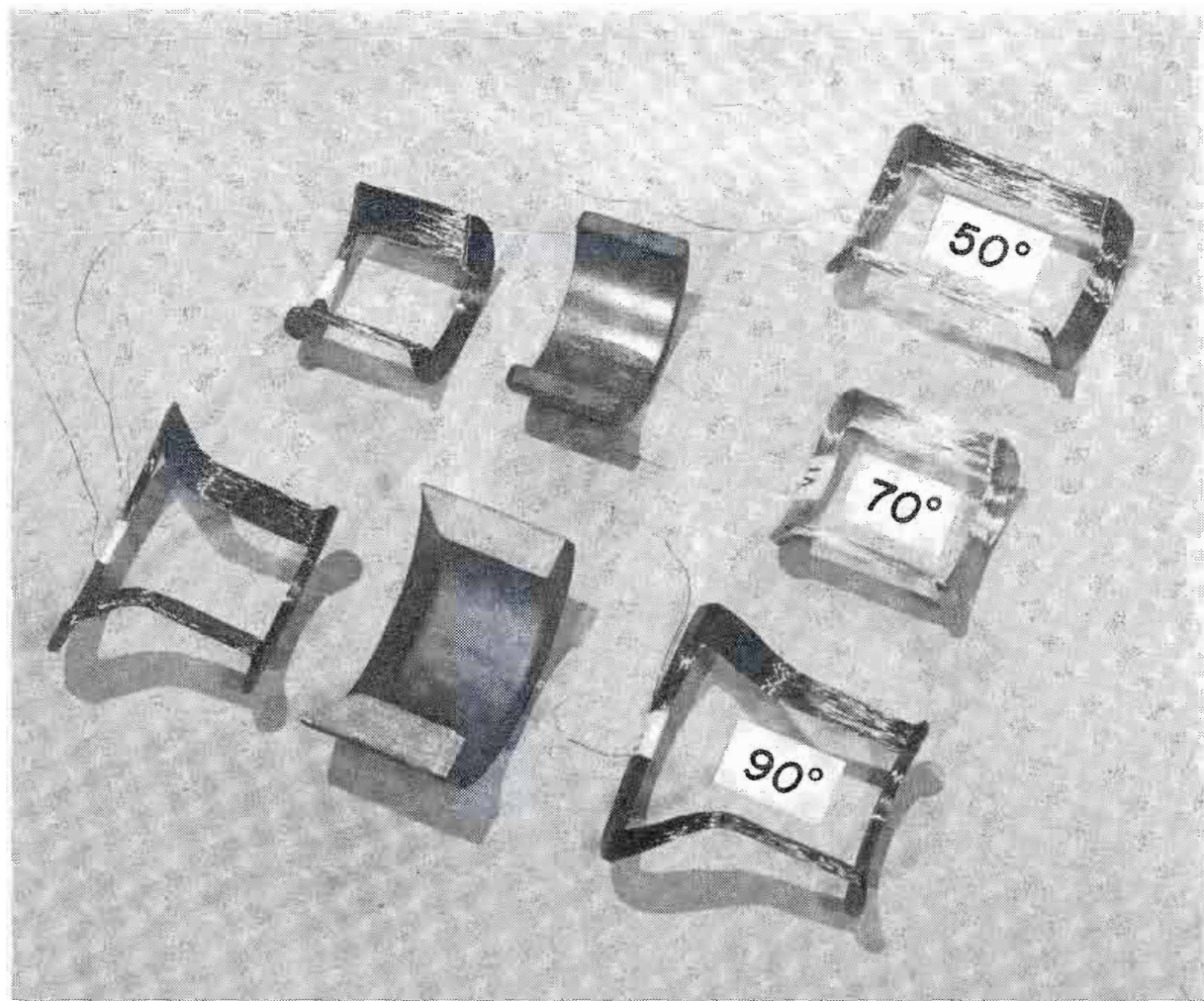


Fig. 4: Comparison of 70° and 90° short coils (1) and their ferrite core segments (c). At right are 50°, 70° and 90° long coils of sweep yokes at their optimum lengths

(5) Note number of turns satisfying above conditions between driver and damper taps.

(6) Split low potential end of secondary winding from main winding at this same number of turns (determined in (5) from ac "ground" extremity. Bridge the winding split with a coupling capacitor.

(7) Shunt smaller isolated winding split in (six) with a variable inductance width control (or a fixed reactor), isolated from d.c. connection to the transformer winding start by a capacitor.

(8) Feed B supply of output stage through this width control, into isolated section of secondary, out into linearity coil and inverted damper, back into upper segment of primary to driver plate. By doing this, opposite direct current flow through the two equal winding sections will remove the dc flux bias on the core and result in maximum ac reactance developed by the assembly.

Previous ferrite cored output transformers contained 0.3 square inch core cross-section for 50° sweep at low anode voltages. Note that the desaturated model 90° transformer shown in Fig. 2 requires only 0.125 square inch of core cross section for 17 KV sweep. The ultimate core design allowing for optional desatura-

tion contains 0.2 square inch cross-section.

As a further point, an octagonal cross section of core allows 41% more iron within the same internal diameter of coil form, than would the older, square section. Round cores would provide better space utilization and higher coupling, but are difficult to side-mold. End-molding has been proposed, to achieve a rounded core.

## Autotransformers vs. Separate Secondaries

It has been found that performance of the system is enhanced over 15% in efficiency for a given rate of retrace by use of autotransformers for low stepdown ratios from driver to damper, compared with separate primary and secondary windings on the same core. Leakage reactance between driver, damper, and yoke sections of the winding is minimized and some current cancellation occurs in windings common to driver and secondary loads. The primary, tapped for secondary loading, occupies less space than separate primaries wound over the secondary coil on the same sized core. Capacitance in a formerly outer winding is thus reduced due to decreased radius of the mean turn in that winding. The secondary capacitance

## CR SWEEP SYSTEM (Continued)



Fig. 5: Partial assembly of 90° yoke coils shows extent of coil-incline overlay on flared portion of picture tube neck funnel. Nylon housing is omitted in photograph

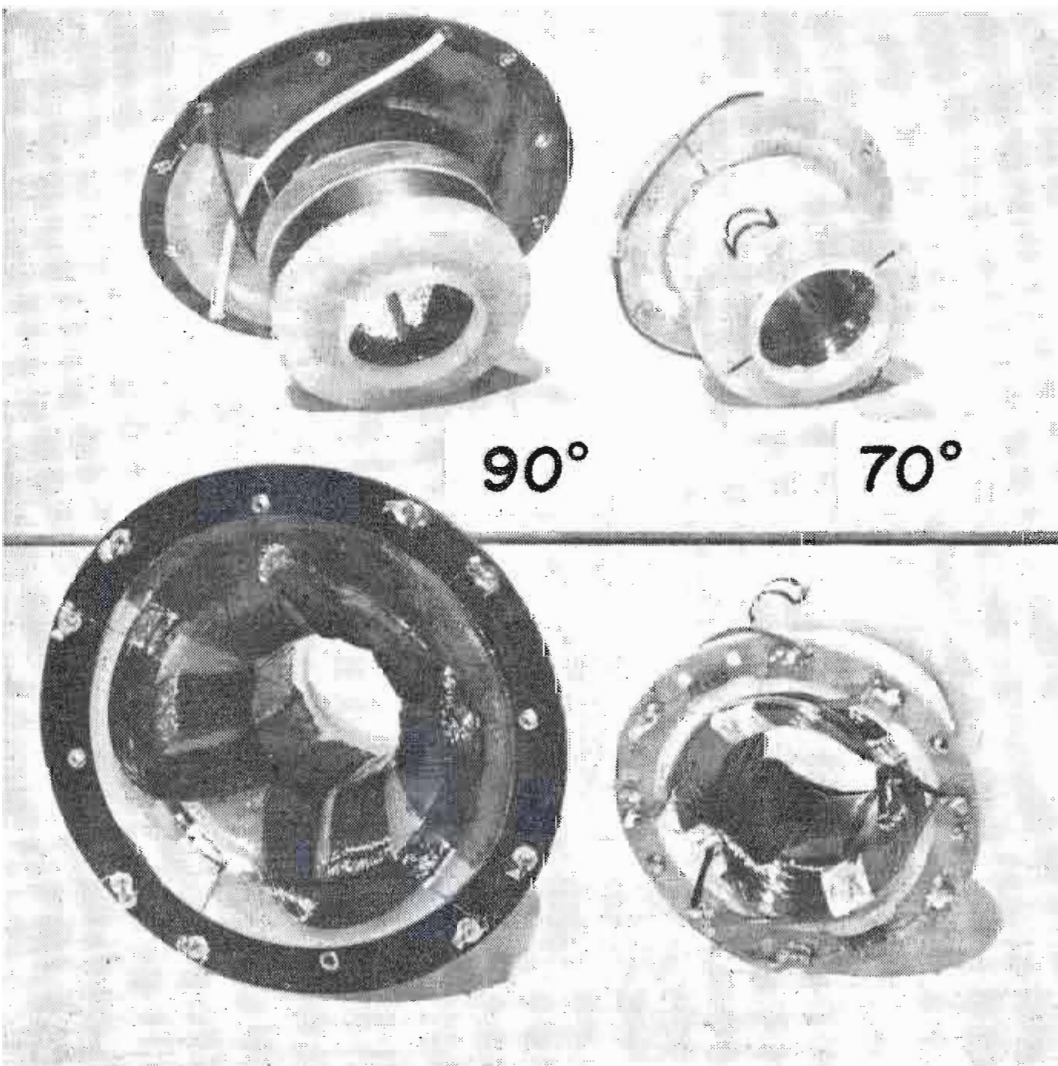


Fig. 6: Front and rear views of 90° sweep yoke compared with contemporary 70° yoke. Both models are nylon cased and provide mounting for beam centering magnets at rear

of a separate coil may be said to have disappeared completely with the tap on the primary of an auto-transformer providing a secondary winding.

Barkhausen oscillations in the driver tube are minimized with optimum autotransformer coupling more readily than in separate secondary type windings.

The capacitance of the tertiary (high voltage extension) winding may be considerably reduced by moving it to the opposite end of the core and winding it over a spool of smaller diameter than the primary coil (See Fig. 2).

The above considerations for horizontal sweep transformers apply less forcefully to the vertical transformer, where the stepdown ratio may lie between 5 and 18 to 1. It is still slightly advantageous to use autotransformation for such ratios.

### Tuned Horizontal Windings

Many attempts have been made at tuning the assembled horizontal sweep transformer through adjustments of the self inductances, leakage reactances and distributed capacitances of the several winding sections. Several commercial transformers built in the past were deliberately tuned to reduce driver, damper and yoke surge voltage peaks for a given sweep action by the yoke.

Graphical analysis shows (Fig. 3) that if any pure sine wave is diluted with rising, in-phase (at the instant of fundamental rising reversal) third harmonic, a nearly square topped surge voltage loop can be effected. This squared loop will obtain at 14-16% third harmonic amplitude, lowering the resultant to 87% of the fundamental excursion, without disturbing the following period if, as in television sweep, the half sine wave is the retrace pulse of yoke voltage, and damping is applied after current reversal. As a voltage surge reduction this 13% cannot be neglected in any thorough design.

Increased amplitude of the third harmonic alone will not further reduce the resultant peak amplitude below 86.6% of the fundamental: incomplete damping of the subsequent harmonic ripple energy decay will become conspicuous in sweep velocity modulation, with excessive harmonic content.

This condition of timing has been effected in the subject horizontal sweep transformers. A single 1B3-GT with this system develops 16 KV anode supply under 100  $\mu$ a beam current loading. The 6AV5-GT

(Continued on page 170)

# HEAT TRANSFER in Subminiature Electronic Equipment

**Reliable operation of airborne devices requires proper cooling, either by conduction to a cooled plate or by direct air convection. Simplified design approach shows how to use best method for a particular system**

By **D. T. DRAKE,**

*North American Aviation, Inc., Downey, Calif.*

**T**HE heat transfer problem in aircraft electronic equipment becomes more difficult not only because of higher aircraft speeds, but also because of the increasing use of miniaturization techniques. The cooling of these miniaturized electronic units must be a part of the basic design if reliable operation is to be obtained. In some respects the requirements of small size and reliability are incompatible, particularly as to heat dissipation. A subminiaturized unit may have one tenth the volume of a standard-size unit performing the same function, with little or no reduction in the power consumed. Heat densities, in typical subminiature packages are normally about 1 w/cu. in. and may vary from ½ to 3 w/cu. in. With heat densities in this range, special design is necessary to avoid excessive temperatures.

A line of standard modular packages, which were specifically designed for good heat transfer characteristics, is now in use. The frames

of these units (Figs. 1 and 2) are aluminum die castings, and are designed to be cooled either by conduction to a cooled plate or by air convection.

Methods of heat transfer calculation (even for extremely simple systems) are usually complex. Also, very few data are available in the literature for a complex system such as a radio chassis. Because of these factors all heat transfer calculations for electronic equipment are only approximations.

The basic equation of heat transfer is Newton's law of cooling:

$$Q = h A \Delta t \quad (1)$$

where  $Q$  is the time rate of heat dissipation and will be given here in watts,  $A$  is the transfer area in sq. ft.,  $\Delta t$  is the temperature rise in °C, and  $h$  is the heat transfer coefficient in watts/sq. ft./°C. The electrical analogy to this is the conductance form of Ohm's law.  $Q$  is equivalent to current and  $\Delta t$  to voltage. By thinking in terms of unit area heat

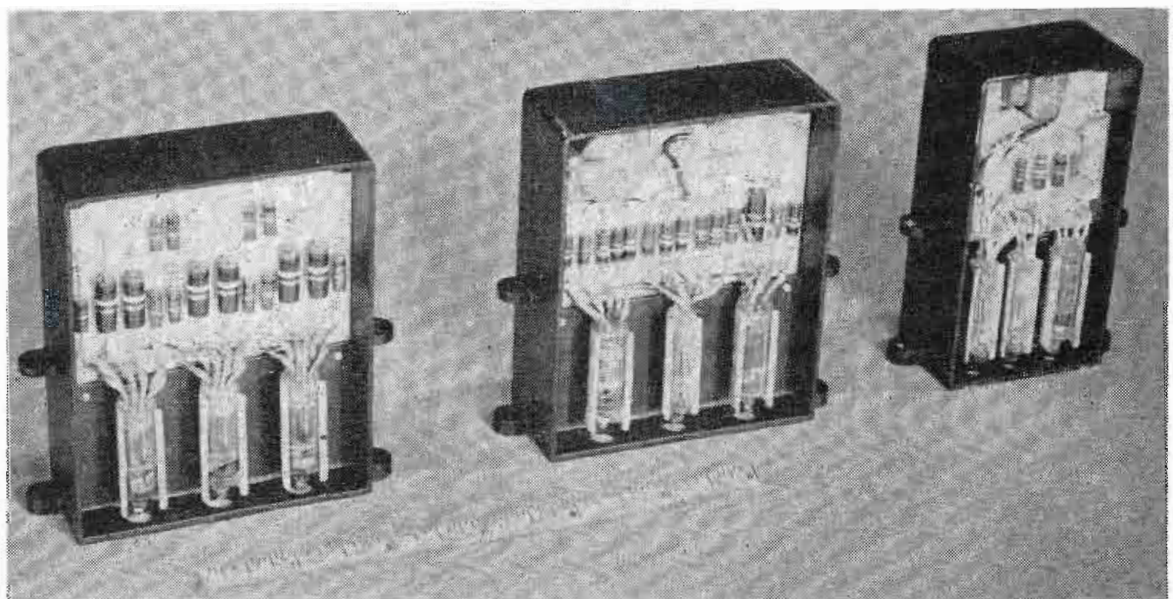
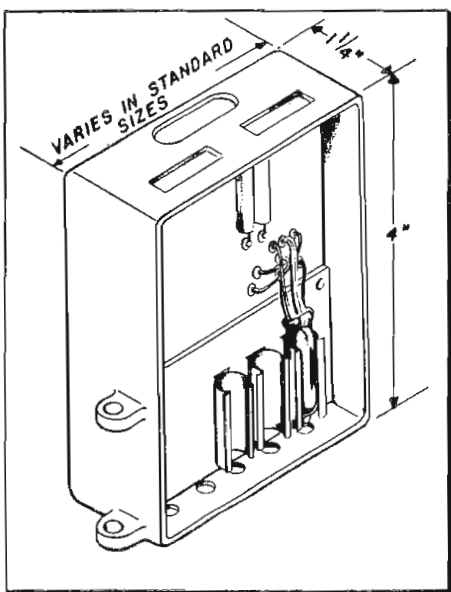
dissipations the area term can be omitted, and  $h$  will then be equivalent to electrical conductance.

This discussion is primarily concerned with methods of calculating or estimating this heat conductance factor. Heat transfer is normally classified into conduction, radiation, and convection. Convection is further divided into natural convection, forced laminar convection, and forced turbulent convection. Each of these classes ordinarily requires a different method of calculation, and each will be present in some degree in complex electronic equipment. However, some simplifications can be made. Forced laminar convection is omitted in this discussion, and the term "forced convection" will hereafter be applied only to forced turbulent convection. Also, as the variation of the heat conductance for both natural convection and radiation is primarily dependent upon the temperature difference, the two effects can be combined into a single curve with good approximation.

## Conduction Cooling

Radiation and natural convection may be combined with conduction in a cooling system design. This design uses a cold plate on which the various electronic units are mounted. Conduction to a cooled plate will provide satisfactory cooling in a design using subminiaturized equipment of high heat density, if it is properly heat-engineered. The design requires a careful analysis of

Fig. 1: (l) Typical modular unit. Fig. 2: (r) Experimental electronic packages with die-cast aluminum frames may be cooled by conduction or convection



## HEAT TRANSFER (Continued)

the heat flow path from the heat producing unit to the ultimate heat sink. Design features to be incorporated are short conduction paths, high emissivity surfaces, and heat shielding of low-temperature components to protect them from direct radiation. Where heat must be transferred across a metallic joint, smooth contact surfaces under pressure, with adequate transfer areas, are required.

### Heat Flow Path

The heat flow path in the unit of Fig. 1 can be divided into four sections. The first section is the temperature difference between the subminiature tube and its tube shield or mounting clip. This temperature difference may vary from 20°C to 60°C, depending on the heat load, the shaping of the tube clip to fit the tube, and the radiation emissivity of the clip. In a typical test in which the heat dissipation per tube was 2 w and the over-all temperature rise above the cold plate was 85°C, the tube hot spot temperature was 45°C above the tube shield. Because of variability in data this particular temperature drop can only be estimated roughly.

The second section is the temperature difference between the plug-in unit base and the cold plate and is also largely a matter of estimating. The heat conductance across the contact surface will usually vary

from 0.4 to 2 w/sq. in./°C, depending upon the roughness of the surface and upon the contact pressure. A conductance as high as 10 w/sq. in./°C could be obtained with ground and polished surfaces under approximately 50 psi pressure.

A similar situation exists in the third section, which is the temperature drop across the fastening of the tube clip to its mounting plate. With 2 w tube dissipation the temperature difference was found to be about 6°C lower when the tube shields were soldered rather than riveted to the back plate. The open, snap-in type of tube shield has been found to have better heat transfer characteristics than the wrap-around type. Apparently the double heat path to ground of the snap-in type more than compensates for the decreased contact area with the tube.

The fourth section is the conduction heat path through the metal of the tube backing plate and the base. This section is more readily calculable, and charts (Figs. 3 and 4) have been prepared for various standard sizes of aluminum and brass sheet. With the high heat densities encountered in many subminiature designs, the best heat conductors are not entirely satisfactory, and heat paths must be kept short to avoid the need for an excessive amount of metal.

Natural convection to cooled surfaces can be efficient with a layout that provides adequate freedom of

air circulation in a vertical direction. At low heat densities it can be used alone, and at high heat densities it is a useful adjunct to conduction cooling. Convective surface heights and effective air gap spacings become extremely important in natural convection. The heat transfer surfaces have a boundary layer, which is a static air film adjacent to the surface. The heat must be transferred through this air film by conduction rather than convection. This conduction loss accounts for nearly all of the temperature drop in a convection system if the air is allowed to circulate freely. Measurements made with a pair of parallel plates show that the air film has little effect beyond a 3/4-in. gap. With a 1/4-in. gap, one-half of the heat transfer is by conduction and one-half is by free convection. At closer spacings the heat transfer rapidly approaches pure conduction.

### McAdams' Equation

The heat conductance for natural convection from a vertical surface may be approximated by a simplified equation such as McAdams' equation, in which

$$h = 0.175 \left( \frac{\Delta t}{L} \right)^{1/4} \quad (2)$$

where  $h$  is in watts,  $\Delta t$  is the mean surface-to-air temperature difference in °C, and  $L$  is the height of the surface in it. The quantity of heat transferred from an upper horizontal surface will be about 35%

Fig. 3: Heat conduction through 1 x 1 in. low-alloy aluminum plates

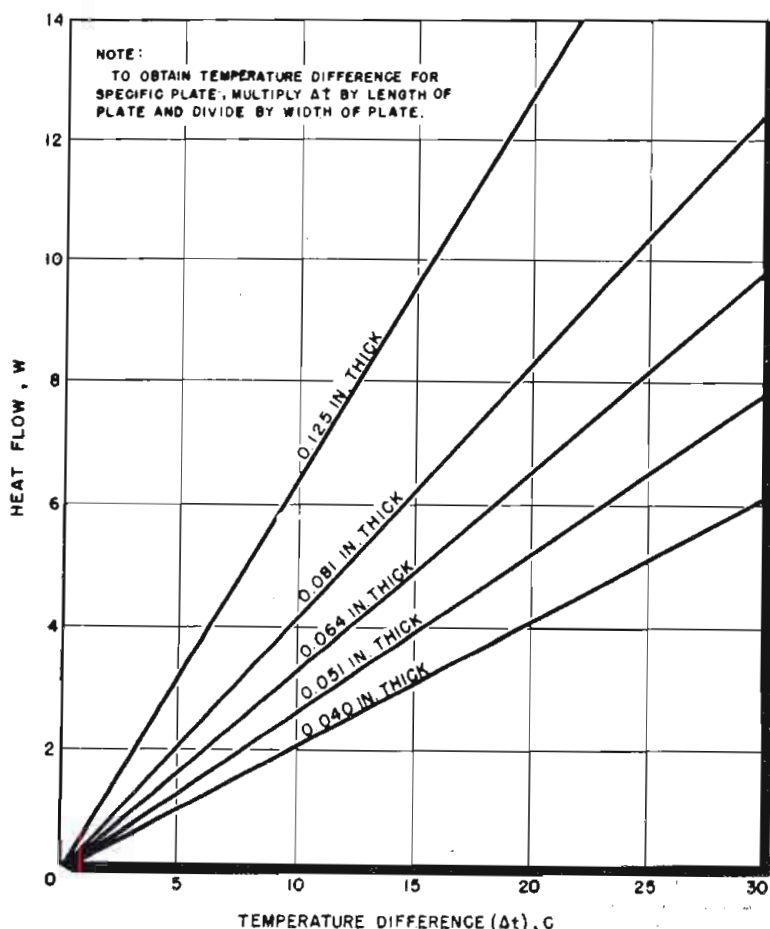
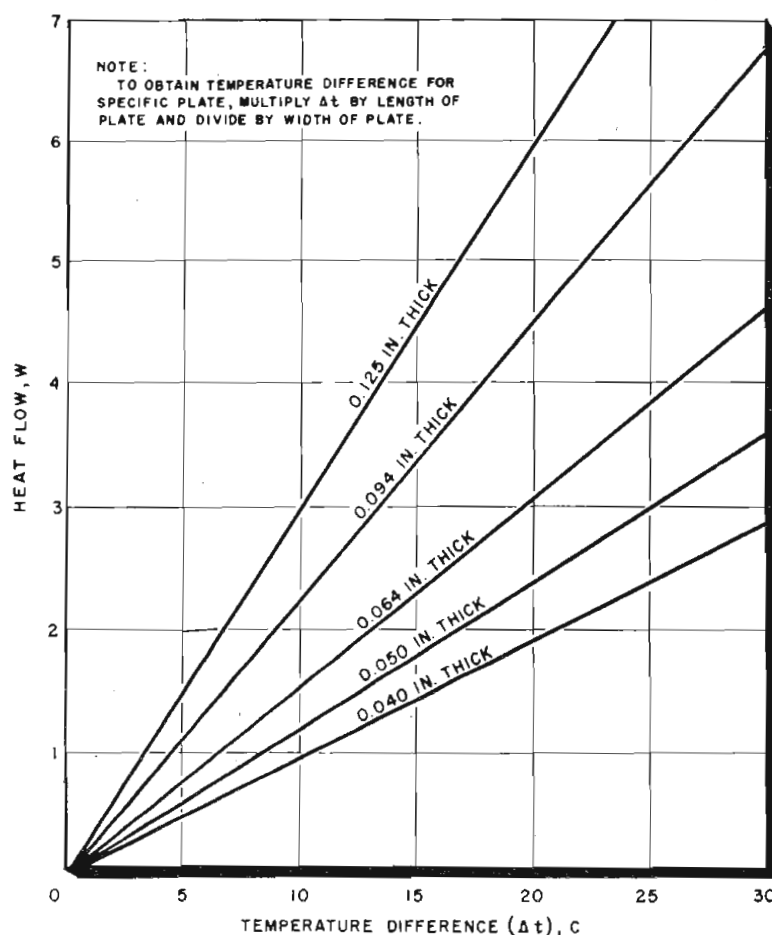


Fig. 4: Heat conduction through 1 x 1 in. commercial brass plates



greater, and that from a lower surface about 30% less, than that transferred from a vertical surface.

The data given in the literature for heat transfer from closed boxes of the type normally used for electronic equipment also include the effect of radiation cooling. For most painted surfaces the radiation effect is more important than the effect of natural convection. The color of the paint is a negligible factor; most oxide type paints have a total emissivity greater than 90% at surface temperatures of less than 100°C. Polished metal surfaces have an emissivity less than 10% and are therefore ineffective as radiators, although they may be quite useful as reflectors. Fig. 5 shows the combined natural convection and radiation from a vertical plate.

These data may also be applied with reasonable accuracy to a closed box. The box is assumed to be in ambient air of approximately 27°C (80°F) with all other surfaces in the vicinity at approximately the same temperature as the air. This curve is a theoretical curve drawn to represent a mean of various published data. It is valid for boxes having surface areas between 0.3 sq. ft. and 15 sq. ft. However, as in most heat transfer work, an accuracy of 15% in any particular application can be regarded as reasonably good.

### Forced Convection Cooling

A suitable method of forced-air cooling for subminiaturized units is a low-velocity parallel system with forced air in direct contact with the heat producing components. Such a system may save considerable fan horsepower, compared with a high velocity series system, as the power required by the fan is proportional to the cube of the air velocity. The high efficiency of a low-velocity system with respect to effective use of the available air (when used with typical electronic equipment) compensates for the lower heat transfer factors and results in less air required as well as less power. Also, a parallel air distribution system can be designed more easily than a series system to distribute the air to components in the proper quantities. Distribution should be directly proportional to the heat dissipation of the components, resulting in a decrease in "hot spot" temperatures.

In this system each tube has its own separate air supply via a hole drilled through the chassis into an air duct under the unit. This air duct is the normal underchassis space which must be allowed for interconnecting wiring and the

mounting of miscellaneous components such as precision resistors. In order to obtain proper distribution of the air, the minimum cross-sectional area of the duct should be 3 or 4 times the total area of the metering holes. The unit sketched in Fig. 1 shows the metering holes for the individual tubes. These hole sizes vary from 1/8 in. to 5/16 in. in diameter, depending upon the wattage dissipated in the individual tubes.

The quantity of air required depends upon the quantity of heat and the allowable air temperature rise. This assumes that the exit air has the same temperature for each of the parallel paths, which is true only where the metering holes have been precisely sized. By assuming an air temperature rise of 14°C (25°F), a simple relationship between the heat quantity and the air quantity is obtained. The air quantity in lbs./min. is equal to the wattage divided by 100. This allows a 5% margin for

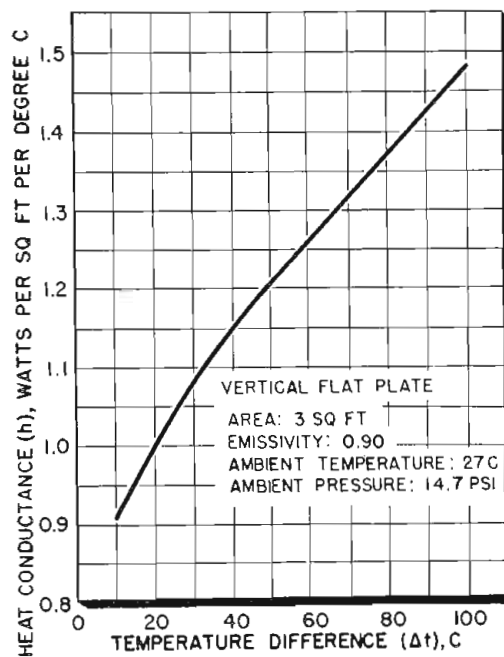


Fig. 5: Combined natural convection and radiation characteristics from a vertical plate

uneven temperature distribution. Pounds of air are converted into cu. ft. by multiplying by 14 at 35°C and by 15 at 57°C.

The heat conductance in the arrangement of Fig. 1 appears to be better than the theory would indicate, partly because of some conduction to the air duct and partly because of the high turbulence of the air as it impinges directly on the tubes. A modified form of the Nusselt equation provides a simple method of calculating the heat conductance because it eliminates the necessity of calculating mean air velocities across the various heat transfer surfaces. This equation is

$$h = \frac{CL}{V} (C_a F)^{0.8} \quad (3)$$

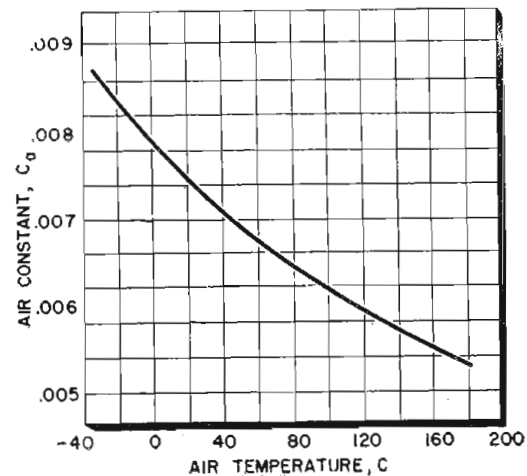


Fig. 6: Variation of the air constant, C<sub>a</sub>, with temperature at sea level air pressure

where  $h$  is heat conductance in w/sq. ft./°C;  $C$  is a general constant which will hold for a general type of configuration, but which will vary with the assumptions made in determining the heat transfer area and the mean temperature difference of Eq. 1;  $L$  is length of the air duct through the package in ft.;  $V$  is free air volume within the air duct in cu. ft.;  $F$  is air flow in cu. ft./min; and  $C_a$  is the air constant, derived by combining the air properties of the Nusselt equation.

Values of the general constant,  $C$ , should be determined experimentally for each configuration type. No values for this constant are included here, as it is too much dependent upon arbitrary assumptions as to mean temperature difference and effective heat transfer area in complex electronic equipment.

The air constant,  $C_a$ , varies with the temperature and pressure of the air. The variation with temperature at sea level pressure is shown in Fig. 6. The variation with pressure is a direct proportionality, which would result in the heat conductance varying as the 0.8 power of the air pressure relative to sea level. The altitude effect is therefore greater for forced convection than for natural convection. With natural convection the heat conductance varies as the square root of the air pressure.

### Air-Cooled Equipment

Air-cooled electronic equipment in modern high speed, high altitude aircraft must operate in a wide range of ambient conditions. These wide extremes of air temperatures and air densities complicate the design of any scheme of cooling with external air. Both a ram-air system and a fan are essentially constant volume devices and will deliver about the same volume of air at all altitudes. This rule will be modified by variations in efficiency and in fan

(Continued on page 154)



# Magnetic Amplifiers

**Circuits, general characteristics and applications of magnetic amplifiers reviewed and compared to electronic amplifiers**

By **SIEGFRIED R. HOH**  
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 Weapons Components Division  
 Wright Air Development Center  
 Dayton, Ohio*

**PART TWO  
 of TWO PARTS**

Part One of this article, published in the May 1953 issue of *TELE-TECH & ELECTRONIC INDUSTRIES*, describes the performance characteristics of core materials and magnetic amplifiers. In this second and final part, the author presents circuit design considerations.

Unlike vacuum tubes, however, the output current is gradually increasing again at increasingly negative control after passing through a minimum (exciting current). In this negative portion of the characteristic the amplifier is non-self-saturating. A comparison of both portions gives an immediate comparison between the performance of the simple and the self-saturating magnetic amplifier. Characteristics of Fig. 13 are suitable for ac signals because the middle of the linear portion coincides with zero control. For dc signals or class C operation, a bias will be desirable. A biasing magnetizing force can be obtained from: (A) an additional bias winding fed from a dc source (Fig. 14); (B) a battery in the control circuit (Fig. 15); (C) a permanent magnet.

**Core Combinations**

Practical self-saturating magnetic amplifiers also use such core combinations as shown in Figs. 6 through 8. The main objective is the achievement of a full wave operation. A practical amplifier circuit is presented in Fig. 14. It derives from Figure 9 by addition of two half wave rectifiers and a bias winding. It should be noted that the load in Fig. 14 still draws alternating current even though rectifiers are employed. If a direct current or demodulated output is required, circuits of Fig. 15 or 16 can be used. The load circuit of Fig. 15 represents a bridge with the load as cross arm. This bridge circuit resembles the

familiar full wave rectifier bridge as employed in Fig. 10. Full wave rectification can also be obtained with only two rectifiers if a power supply with center tap is provided. This well-known rectifier circuit leads to the circuit of Fig. 16 where dc output is achieved with not more than the two rectifiers necessary for achieving self-saturation.

Many control applications, such as self-balancing and self-positioning systems, require an amplifier which reverses its output with the input and gives zero output for zero input. This can be achieved by connecting two amplifiers (of the type shown in Fig. 14) according to Fig. 17, so that the output of both are opposing. Two individual amplifier characteristics and the resultant characteristic are as indicated in Fig. 18. The resultant load current passes through zero and reverses with the polarity of the input. Both dc and ac output can be had with the amplifier type illustrated in Fig. 17.

**Center of Symmetry**

Fig. 19 shows a push-pull amplifier which has essentially the same characteristic as shown in Fig. 18.<sup>5</sup> In addition, it has a center of symmetry about which voltages fluctuate. The required "coupling resistors," however, dissipate more power than drawn by the load. Push-pull amplifiers can be used advantageously for audio amplification with a center tapped output transformer as load.

Other amplifier types which are not so generally used shall be only mentioned here. For more information, references are given. An amplifier in which the output is

taken off the control winding gives a second harmonic output and is particularly suitable for lowest dc signals.<sup>2, 6</sup>

The introduction of capacitors into the magnetic amplifier leads to further modifications and possible increase in gain by utilizing resonance.<sup>7</sup>

Three or multiphase amplifiers have the advantage of less ripple in the dc output. They are among standard commercial types.<sup>8</sup>

The time constant is an expression for the response time upon application of a dc signal. The time constant of a simple inductor is given by the constant  $L/R$ . With magnetic amplifiers, time constants are determined by control, load, bias, feedback circuits, and other minor factors.

Analysis and test also reveal that the time constant  $\tau$  of magnetic amplifiers is not constant in terms of time but constant rather in terms of periods of the applied ac power. This result can be written:

$$\tau = nT \quad (19)$$

where  $n$  is the number of cycles and  $T$  is the period of the applied ac power.  $\tau$  is defined as the time required to reach 63% of the steady state amplitude.

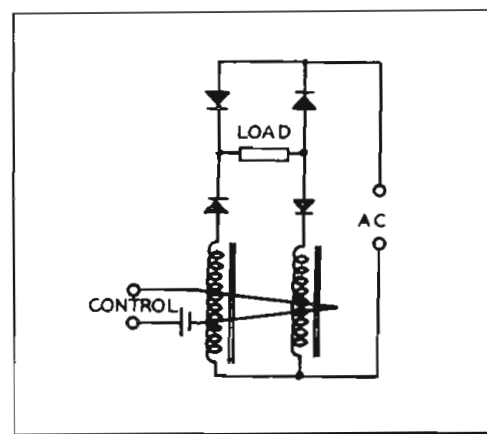


Fig. 15: Self-saturating amplifier, dc output

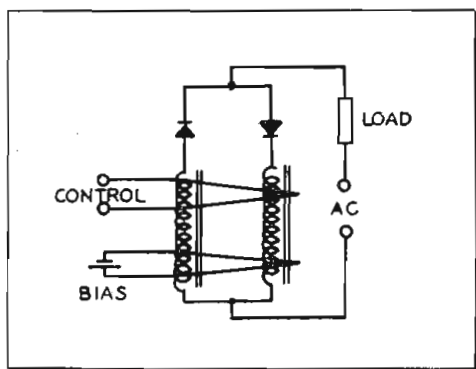


Fig. 14: Self-saturating amplifier, ac output

According to the above relation, the time constant of a magnetic amplifier could be made as low as desired by using a power source of a high enough frequency. Generally, however, the power source will be given and its frequency will be low (60 or 400 cps). Commercial models have time constants of a few cycles.

There are means to reduce the time constant at a given power frequency. A formula for the time constant of the simple series connected magnetic amplifier under simplifying assumptions reads:

$$\tau = \frac{1}{4f} \frac{R_L N_c^2}{R_c N_L^2} \quad (\text{see also Table 11}) \quad (20)$$

This relation indicates which measures lead to a reduction of the time constant, e.g. reduction of control windings  $N_c$ , increase in control circuit resistance  $R_c$ , etc. However, all of these reduce the gain, too. Other factors reducing the time constant<sup>9</sup> are:

1. Series connection of load windings instead of parallel connection.
2. Positive feedback, negative feedback.
3. Smoothing condenser across dc load resistance.
4. Cascading.

It is shown that by cascading of several amplifier stages, the gain is equal to the product of the separate gains while the time constants roughly add up. Thus, the ratio of gain over time constant becomes better by cascading.

It can be seen that figures for a high gain or a low time constant alone do not characterize a good amplifier. A gain of one million can be achieved in a one stage amplifier; however, this is possible with a high time constant only. Low time constants around 1 cycle can also be

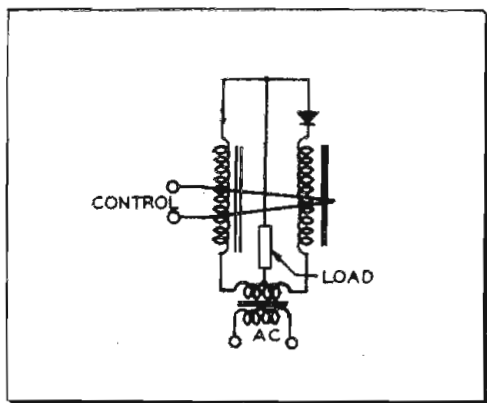


Fig. 16: Full-wave self-saturating magnetic amplifier providing direct-current output

realized at low gain. A better characterization of magnetic amplifiers is given by the ratio of gain over time constant. Commercial amplifiers have a ratio of power gain over time constant in cycles in the range from 15 to 500.

### Output Power Ranges

Like other electronic systems, the frequency range of a magnetic amplifier is closely related to the time constant. A "break" frequency  $f_0$  has been defined as the frequency at which the amplifier response has dropped to 71% or 3 db below the

dc response. The relation between this break frequency, time constant, and power frequency  $f$  is:<sup>8</sup>

$$f_0 = \frac{f}{2\pi n} \quad (21)$$

Aside from the modulator characteristics, this equation, too, limits the signal frequencies to those well below the power source frequency.

In summary, two factors favor the use of high power source frequencies:

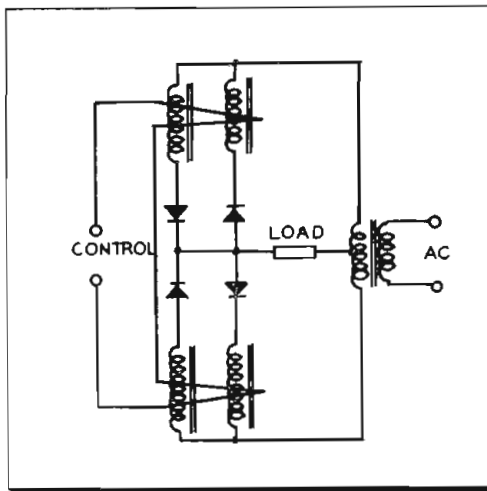


Fig. 17: Example of self-saturating magnetic amplifier circuit with reversible polarity

1. Achievement of a low time constant.
2. Achievement of a wide signal frequency range.

It has been pointed out that ferrites have to be used for high frequency applications. With such materials, magnetic amplifiers have been operated up to the megacycle range. The requirement of a power source of even higher frequency, however, makes the application of magnetic amplifiers for radio frequencies less practical. Consequently, only experimental applications have become known. Another factor restricting the application of high power magnetic amplifiers with respect to frequency range is the dry disc rectifiers. The disc area required is proportional to the current flow. The capacitance between the discs, however, is also proportional to the disc area. The disc capacitance represents a limiting factor for magnetic amplifiers in the kilocycle range.

A rough outline of the field of application with respect to power and frequency is presented in Fig. 20. At low frequencies, the maximum power for which magnetic amplifiers can be built is almost unlimited. The available power frequencies of 60 or 400 cycles represent the first limiting factors. The rectifier capacitance is a more fundamental limitation, unless high current electronic rectifiers are to be used. At high

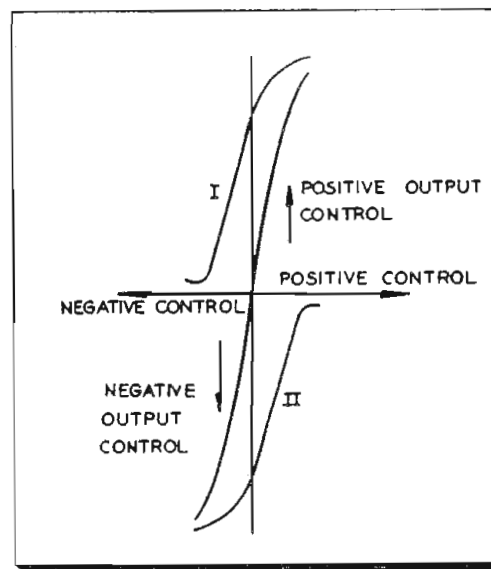


Fig. 18: Achievement of reversible output characteristic from opposing characteristics

frequencies, the rectifier used, such as a crystal diode, limits the maximum power output.

Minimum signal levels of amplifiers are generally limited by noise levels. Noise levels of magnetic cores are determined by the Barkhausen noise. Various theoretical and experimental investigations of core noise levels have been made. According to Williams and Noble<sup>6</sup>, the results of these investigations can be summarized as follows: Noise level less than  $10^{-19}$  watts per cycle bandwidth, zero error  $5 \times 10^{-17}$  watts, variations of  $3 \times 10^{-18}$  watts over periods of two hours.

These results can hardly be realized with practical magnetic amplifiers. Noise levels due to power supply and rectifiers (if any) are usually higher than these figures. In addition, line voltage, wave shape and frequency variations, aging of components, and temperature variations restrict the minimum input level. At the present time, practical minimum input levels are considered to be  $10^{-10}$  to  $10^{-14}$  watt.

### Non-Linear Curve

In discussing wave shape and distortion, it shall be recalled that the magnetic amplifier operates as a modulator. Hence, it should be clearly distinguished between the power or "carrier" frequency and the signal or "envelope" frequency. The utilization of a non-linear magnetization curve indicates that the output wave shape of the carrier will be distorted. This can also be seen in Fig. 12. Relatively low carrier distortion, if desired, can be obtained by operating according to Fig. 2 or by other measures.<sup>10</sup>

Generally, the signal or envelope frequency is the only concern. The signal is obtained after rectification  
(Continued on page 176)

# S-Band Sweep Generator

**Specially developed instrument measures frequency response of traveling-wave tubes and S-band components without tedious process of point-by-point readings. Fixed and thermally-tuned klystrons provide 1000-MC sweep**

By **ROY E. LARSON**, Naval Research Lab., Washington 25, D.C.

**T**HE design of an S-band sweep generator and test set arose from the need of obtaining measurements of the frequency response of traveling-wave tubes and S-band components without the tedious process of point-by-point measurements. It was decided that a 1000-mc sweep centered at 3100 mc would be most advantageous for the apparatus to be tested. It was also desirable that the output be as flat as possible over this 1000-mc range and that the entire unit be compact and without moving parts.

The S-band frequency sweep is obtained by mixing the output of two K-band klystrons in a K-band mixer. One klystron is set at a fixed frequency and the other is thermally tuned by means of a pulse applied to its thermal grid causing it to sweep over a 1000-mc range.

A thermally-tuned type 2K50 reflex klystron provides a signal which sweeps from 23,500 to 24,500 mc. A Raytheon type QK-306 velocity variation klystron employing a self-contained cavity provides the fixed frequency signal. This tube is mechanically tunable from 18,000 to

22,000 mc. When the QK-306 klystron is set at 20,900 mc, it provides an S-band center frequency of 3100 mc for a 1000-mc band as the 2K50 klystron sweeps from 23,500 to 24,500 mc. The QK-306 fixed-frequency klystron is square-wave modulated to facilitate detection by means of a tuned amplifier.

## Amplitude Variation

Since variations in the output amplitude of the mixer are primarily dependent upon variations in the weaker signal entering the mixer, the fixed-frequency signal was made the weakest so that variations in the output of the 2K50 klystron as it swept over its range would have a small effect on the amplitude of the S-band output. The output of the 2K50 klystron is fed directly into the mixer and is intentionally maintained at its maximum power to secure a nearly constant conversion efficiency although relatively large variations may occur in its output as it sweeps.<sup>1</sup> This procedure also permits a greater output from the mixer because the fixed-frequency

signal can be set at a high level while still maintaining a satisfactory ratio of local oscillator power to signal power. Unfortunately, this ratio also results in a higher noise figure, but this is outweighed by the advantages of maintaining a constant and greater mixer output power over the band.

The power from the 2K50 klystron in conjunction with the smaller power from the QK-306 klystron causes a crystal current of approximately 4 ma. However, no crystal failures have occurred to date as a result of the relatively large crystal current. A block diagram of the system is shown in Fig. 1.

## Waveguide Circuitry

A variable attenuator in the output line of the QK-306 klystron serves to control the output of the mixer. This is a commercial flap-type attenuator using a resistance card disc as the absorbing element.

The mixer is a broadband cross-bar type using a 1N26 crystal. The crystals may be readily interchanged. Both Sylvania and Western Electric crystal units have been used satisfactorily. Although a means is provided in the crystal mounting for varying the insertion of the crystal for tuning purposes, this adjustment is not critical and different crystals have given almost identical responses.

The directional coupler, built to couple the 20,900-mc signal to the mixer, is simple double-slot coupler with a quarter-wave slot spacing.<sup>2</sup> It was designed to have a coupling coefficient of 9 db.

A type-N connector on the mixer output couples to a broadband co-

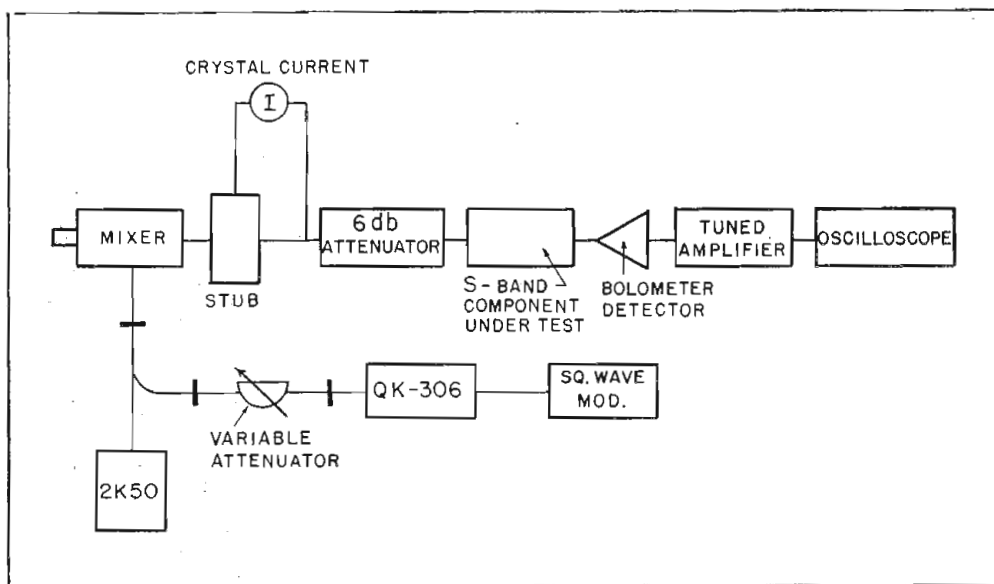


Fig. 1: Block diagram of S-band sweep generator and test set with 1000 MC sweep band

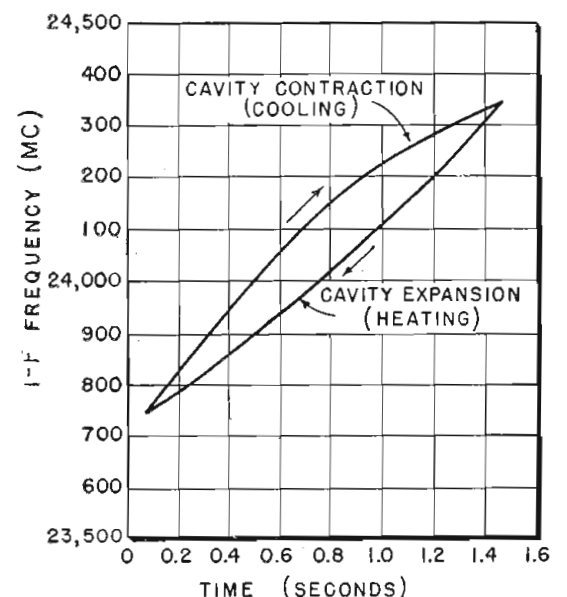


Fig. 2: Thermal tuning characteristics of 2K50



# and Test Set

axial stub support which provides a return for the crystal current and may be used to monitor the current.<sup>3</sup> A series capacitance is introduced into the coaxial line at the stub output terminal and is made a part of the stub structure. This section has a negligible effect on the mixer output signal, but it prevents the crystal current motor from being short circuited if the system should be operated into a device which is a dc short circuit.

A 6-db metalized-glass attenuator is placed between the stub and the output terminal of the test set so that the output impedance of the mixer remains fairly constant and reflections reaching the mixer from the load are negligible in normal operations.

Silicon crystals at microwave frequencies are much more frequency sensitive than bolometers and are also less uniform in their characteristics.<sup>2</sup> For these reasons it was decided to use a bolometer as the detector of the S-band sweep although its sensitivity is much less. To avoid the use of dc amplifiers and the drift problems of bridges, the output of the QK-306 is square-wave modulated by a symmetrical multivibrator. The demodulation of the bolometer bias current is then

amplified with a conventional tuned amplifier. The bolometer used as a detecting element is the PRD type 631-C contained in the PRD type 627-A bolometer mount. The frequency response of this bolometer and mount is at least as good as the mixer output over the range of frequencies used in this test set.

### Thermal Tuning

It is desirable that the frequency vs time relationship of the klystron sweep be as linear as possible so that the frequency response as shown on an oscilloscope will have a linear frequency base. Tests made on a 2K50 klystron indicated that the variation of frequency with time was not linear when a square pulse of voltage was applied to the thermal grid causing it to sweep over a frequency range. This is shown in Fig. 2. The change of frequency with time when the klystron is sweeping from a lower to a higher frequency does not correspond to the change when sweeping back from the higher to the lower frequency. This fact is apparently due to the unequal rates of heating and cooling of the frequency-determining element in the 2K50 klystron. In this test set, only the sweep from the lower to upper

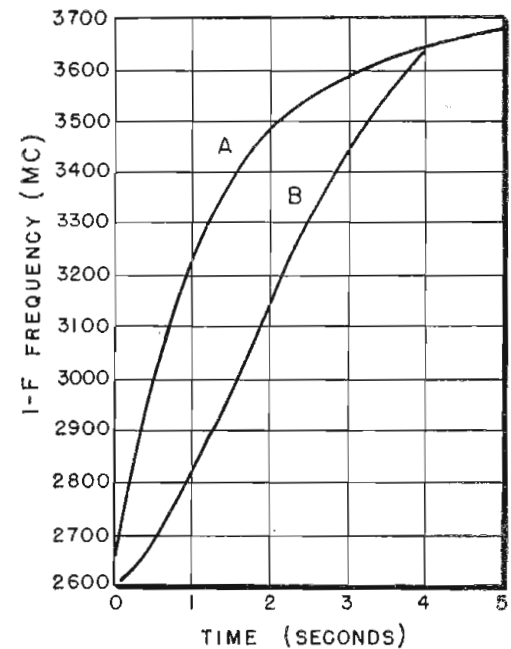
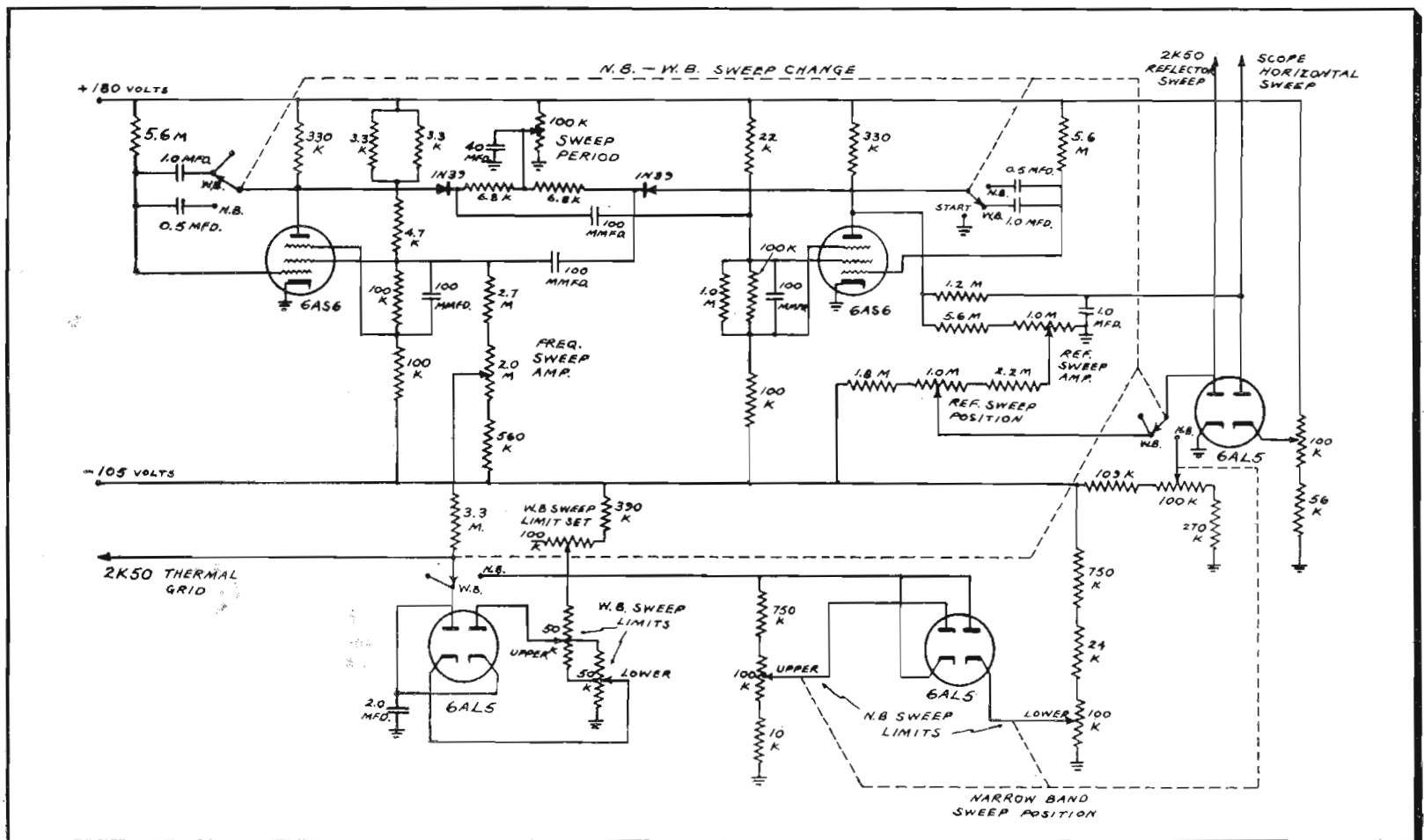


Fig. 3: Thermal tuning characteristics of 2K250 klystron after mixing with 20,900 MC signal

frequency is used. Over an observed range of 1000 mc, Curve A of Fig. 3 was obtained at the mixer output frequency when the 2K50 thermal tuning grid was pulsed with a -13 volt square pulse of 5-second duration. By slowing down the rise time of the pulse by integration it was possible to obtain a nearly linear variation of frequency with time covering 1000 mc in 4 seconds. This is shown in Fig. 3, Curve B.

To maintain the output of the 2K50 klystron at the optimum power level during the 1000-mc sweep, the klystron reflector voltage is also

Fig. 4: Klystron and oscilloscope sweep circuit consists of free-running, double screen-coupled phantastron



## S-BAND GENERATOR (Continued)

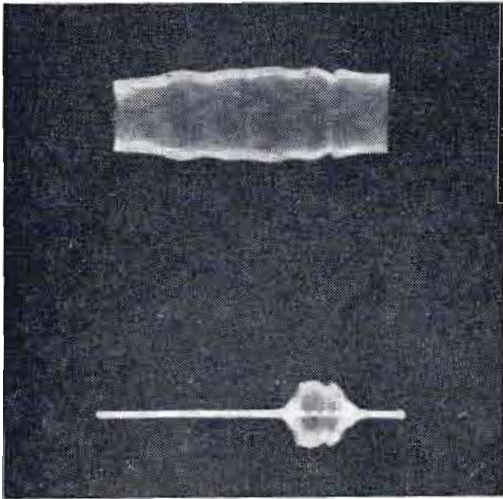


Fig. 5: Transmission characteristics of 250 MC bandpass filter on wideband position

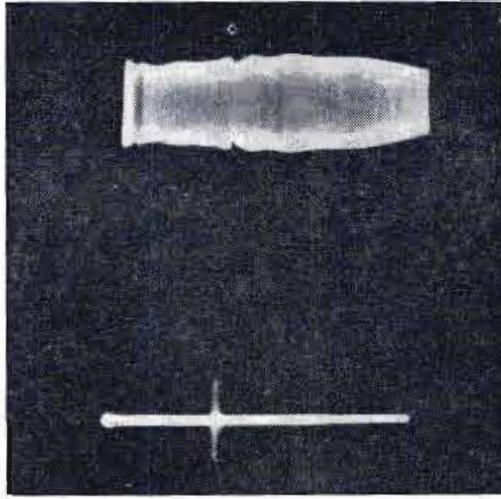


Fig. 6: Transmission characteristics of 23 MC bandpass filter on wideband position

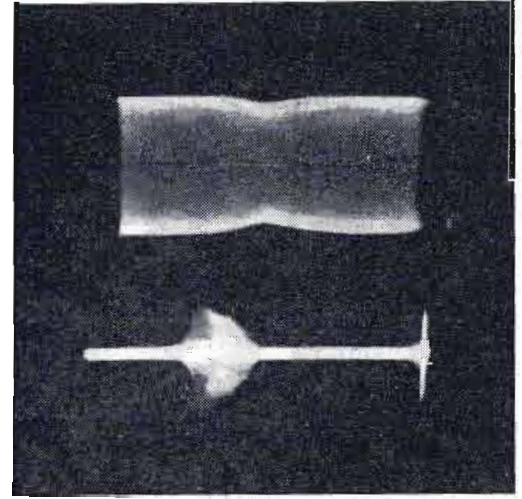


Fig. 7: Transmission characteristics of 23 MC bandpass filter on narrowband position

swept so that the output power is at a maximum during the entire sweep. The same circuit that furnishes the pulse for the thermal tuning furnishes this reflector sweep and also provides a linear sweep for the oscilloscope. The circuit used to provide the necessary wave forms is a free-running, double screen-coupled phantastron<sup>4</sup> shown in Fig. 4.

Two sweep ranges are provided, one of which sweeps over a full 1000-mc range centered at 3100 mc and another which provides a narrower sweep whose center frequency is continuously variable and can be set at any frequency within a 1200-mc band by means of a single control. It is possible to increase the overall range on the narrower sweeps to cover a region from 2600 to 3800 mc. The frequency range of the narrowband sweep is about 100 mc wide at the lower end of the region and increases to about 175 mc at the upper end of the region. The narrow sweep is particularly useful for observing narrowband components and portions of broadband components.

### Oscilloscope Presentation

The demodulation component of the bolometer current is amplified with a tuned amplifier having a twin-T frequency selection network.<sup>2</sup> The tuned amplifier has two inputs either of which may be selected by a switch on the front panel. The bolometer detector is permanently connected to one input and the other is available to be used with other detectors, or a frequency meter may be connected to it to provide frequency-marker pips on the oscilloscope.

The negative half of the sine wave output from the amplifier is clipped and the positive portion applied to

a vertical deflection plate of the cathode-ray tube. This furnishes a base line and an amplitude variation which is proportional to the power at the detector input. The amplifier used and described above is a modified TAA-16EA tuned amplifier. The linear horizontal sweeps are provided by the circuit mentioned previously. Since it takes 4 seconds for the klystron to sweep over the 1000-mc range and there is a 4-second quiescent period before the next sweep, a long-persistence cathode-ray tube, the 5JF7, is used. With the narrower sweep, the sweep time is about 2 seconds with an equal quiescent period. A maximum vertical deflection of 1.5 in. on the CRT may be obtained before the amplifier circuits begin to limit the output.

Since the deflection amplitude is approximately proportional to power, a linear scale may be used to read direct power ratios or a logarithmic scale may be used to indicate power ratios in db.

With the 6-db pad between the mixer output and the output terminal, the maximum S-band power output from the system is approximately 40  $\mu$ w. This is average power as measured with the bolometer used in the test set, and since the S-band output is square wave modulated the peak power during the on period is about 80  $\mu$ w. This peak power should develop about 63 mv across an impedance of 50 ohms. The measured voltage output of the bolometer is about 3 mv peak-to-peak of the square-wave modulation component. The power variation in the S-band output is less than 1.5 db in the wide-band 1000-mc position and less than 0.5 db in the narrow band 100-mc position.

The photographs shown in Figs. 5 to 8 demonstrate the performance and capabilities of the sweep gener-

ator and test set. In Fig. 5, the frequency characteristics of a 220-mc waveguide bandpass filter are shown in the top trace using the wideband position. The bottom trace indicates the S-band power variation over this 1000-mc frequency range. Fig. 6 shows the response of a 23-mc waveguide bandpass filter on the wideband position with the corresponding S-band power variation. Fig. 7 shows the same 23-mc bandpass filter as displayed on the narrowband position with the corresponding S-band power variation. Fig. 8 is a photograph of the frequency response of a traveling-wave tube (second trace from top) on the wideband position. The top trace is again the S-band power variation. This traveling-wave tube is intended to operate in the region around 3100 mc. The third trace from the top in Fig. 6 shows a wavemeter pip mark-

(Continued on page 160)

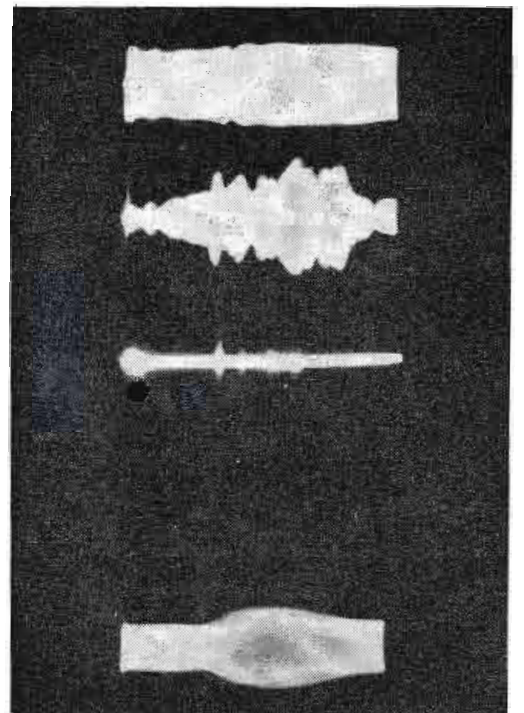


Fig. 8: Transmission characteristics of 3100 MC traveling-wave tube, wide and narrowband

# Quality Control of Airborne Equipment

**Air Force inspectors evaluate contractors' facilities and test methods in addition to final check of product; compliance procedure is outlined**



By  
**BERNARD  
HECHT**  
Quality Control  
Consultant  
Little Silver, N.J.

**T**HERE is an important phase of airborne electronic equipment manufacture about which little has been published. This is on the subject of Quality Control, and it is important enough to the Government to be the subject of a Military Specification, MIL-Q-5923A (USAF) which has been applied widely by the U.S. Air Force. This article discusses what this specification means, and tells how to organize to comply with its provisions in an efficient manner.

## Government Policy

The U.S. Air Force takes a view on quality control which is different from that of the other Services. The policy consists of surveillance of the contractor's or subcontractor's facilities and systems as the prime activity and checking of the product as a secondary activity. Under the Air Force system, there is emphasis on evaluation and verification of such things as the contractor's organization, records, gages, test equipment, paperwork procedures, and then fin-

ally product inspection. The idea here, and it is in agreement with modern quality control principles, is that only by establishing and maintaining proper quality control systems can the Contractor assure the Government that the product being shipped is in accordance with the requirements of the specifications. Continuing good work is the result of good systems and processes, according to this view.

The Air Force Inspectors are given the job of policing to see that the contractor establish and maintain an acceptable Quality Control system. An acceptable system is one which assures that Government supplies are presented in strict accordance with the applicable purchase specifications, and the Government representatives must do careful and continuous evaluation of objective evidence to see that the contractor has control of his products. The Inspector may vary his procedure from complete 100% reinspection of product at one extreme, down to partial or sampling inspection at the other. He would vary his inspection in accordance with his findings in evaluating the evidence at hand; such items as the following are considered objective evidence: Test reports, Certificates of Compliance (where reliability of the vendor has already been established); Statistically sound process control charts, Knowledge that a given process automatically controls by its nature; Test Data; Records of Inspection.

A very important factor in Air Force Inspection is the evaluation of

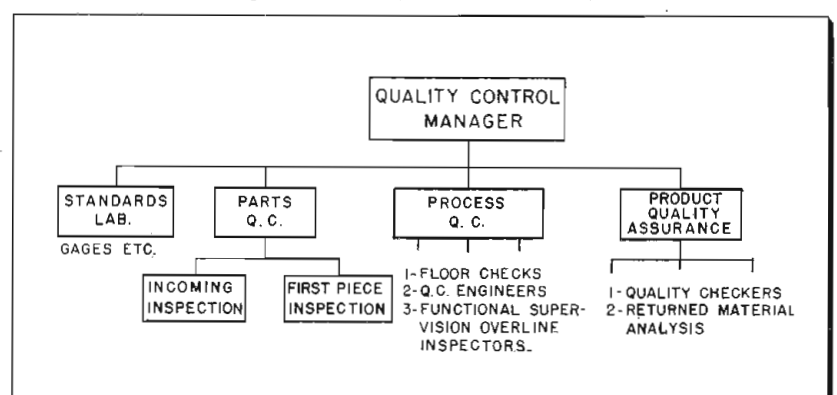
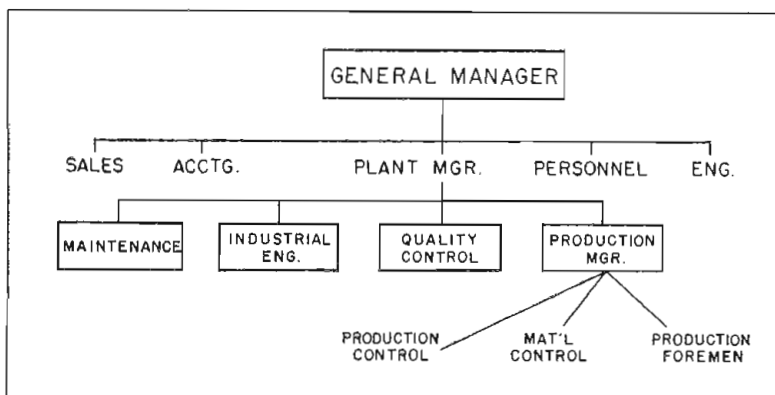
records of corrective action within the contractor's organization. Where repeated defects are shown in the contractor's records, some concrete evidence of requests for correction and action accordingly is required. The fact that records are kept and that they show a lot of trouble is found and reported, is not enough; the Government wants to see "corrective action." Modern quality control requires this step as the most important single phase of the cycle of information, analysis, then correction, which describes its workings.

Having reviewed what the Government expects; let us now follow a typical scientific attempt to meet the Government requirements. Even small contractors should be able to follow many of these suggestions. No guarantee can be made here that the generality mentioned will fit every single case, but the ideas should serve as guides to stimulate proper actions. Any system is subject to review by the Government authorities involved before it can be considered acceptable.

## Meeting the Requirements

The first step is to set up a proper relationship between the Quality Control function and the others in the Company. As a general rule the Quality Control function should not report to the Production Manager, but should be independent of the pressures of production. Probably the best generalization is shown in Fig. 1, which shows a typical or-  
(Continued on page 156)

Fig. 1: (l) Typical organization in a medium sized plant. Note that Quality group should not report to Production Manager. Fig. 2: (r) Quality Control organization in a typical medium sized electronic plant has jurisdiction over incoming materials, process, finished product and standards



# CUES for BROADCASTERS

Practical ways of improving station operation and efficiency

## Time Signal Tone

T. R. ENGLAND, Chief  
Engineer, WMIK, Middlesboro, Ky.

A very useful production aid in broadcasting is an audio tone for use as a time signal. A ready source of tone is also required for the interim Conelrad alerting procedures.

A convenient tone source is available to those stations having a combination studio-transmitter setup: the beat note produced between the transmitter carrier and frequency monitor, which is available on the front panel of the monitor. This tone is easily "padded" down to feed into a spare channel or remote circuit without affecting frequency monitor operation.

At WMIK it was necessary to build an oscillator, since we are not a "combo" station. After experimenting with several types, we settled on the phase shift oscillator. No other type could be found that generated such a stable, undistorted (1.5%!) note, and since the bulk of the oscillator is the 6J7 tube, room for it can be found on any console chassis.

We chose a frequency of 1,600 cycles, as we believe it to be more noticeable than the standard 1,000 cycle tone, but any other frequency is readily obtained by keeping the Xc to R ratio of each L-section equal to 1.73. However, the following precautions should be observed: (1) the first section impedance must be high enough not to shunt the plate load circuit; (2) progressively increasing values of R and decreasing values of C should be used in order

## \$\$\$ FOR YOUR IDEAS

Readers are invited to contribute their own suggestions which should be short and include photographs or rough sketches. Typewritten, double-spaced text is requested. Our usual rates will be paid for material used.

to prevent interaction between the L-sections.

The 500 ohm resistor tied across the potentiometer arm materially reduces the voltage across the output circuit when the tone is not being applied to the program buss, thereby minimizing any possibilities of stray electrostatic coupling.

## Protecting Antenna Meters From Damage by Lightning

JACK C. ANDREWS, WISH,  
Indianapolis, Ind.

THE basic principle behind this arrangement lies in the fact that the meter is not merely shorted out. It is taken completely out of the circuit, thereby giving positive lightning protection. The shorting switch, which completes the circuit when the meter is not in use, is constructed of two pieces of strap brass with parts of a jack knife switch mounted on the ends of the straps. On the opposite side of the brass, is a pair of clips into which the meter can be plugged when readings are being taken. These clips are also made of strap brass. The meter is modified by means of two pieces of copper tubing, flattened on one end with a hole drilled to accommodate

the meter terminals. Four of these clips are required. Two are bolted to the switch and two are mounted elsewhere in the tuning house for holding the meter when it is not in use.

Place the meter in the clips on the switch and open it to take readings. After the readings have been taken close the switch, remove the meter and place it in the holding clips mounted elsewhere. This system might not be possible where higher powers are being used; but there are plenty of low power stations in the country that might use such a system.

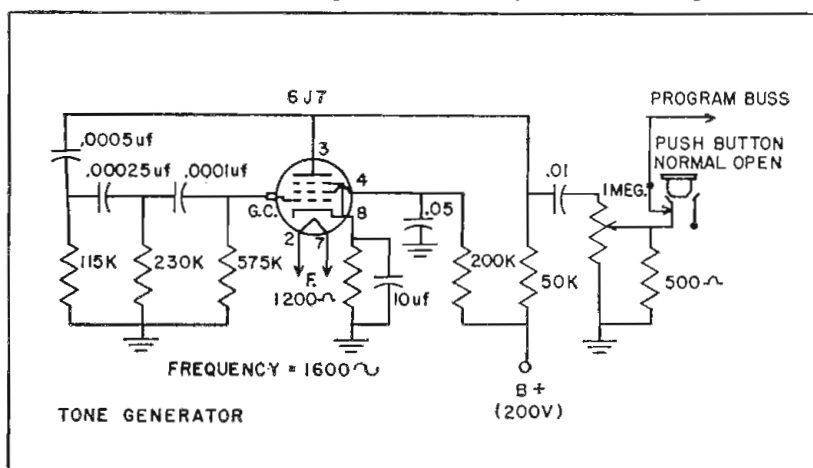
## Magnecorder Speed Modification

CHARLIE H. PARISH, Chief  
Engineer, WFPM, Fort Valley, Ga.

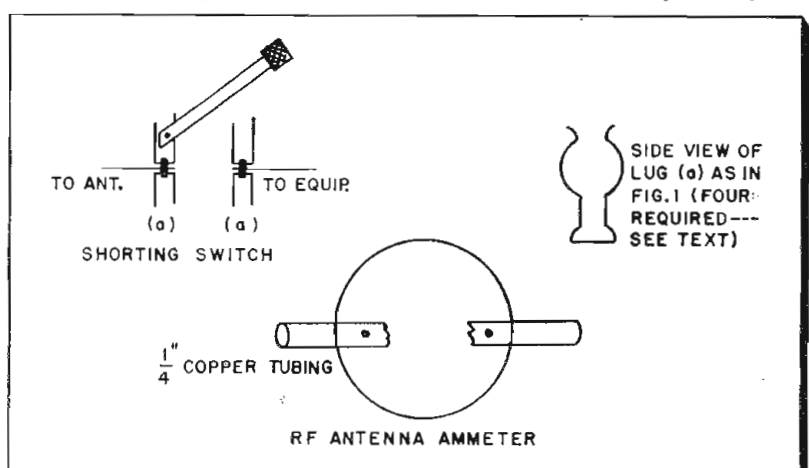
MANY suggestions have been made concerning the PT6 Magnecorder and its conversion and modification to permit better and more convenient operation in broadcast stations. The most useful modification in our operation is the ability to switch quickly from one tape recording speed to another.

Our PT-6AH Magnecorder was equipped with a two speed motor designed to furnish speeds of 7½" and 15"/sec. The switch which changed the motor speeds was deep inside the case. Since nearly all tapes used in broadcast work are either 3¾" or 7½"/sec., this switch received little use. Before modification the concealed motor speed switch was set to slow speed giving normal recorder speed of 7½"/sec. with use of capstan and pressure roller of equal size. The 3¾"/sec.

Phase shift oscillator generates almost pure tone time signal



Antenna meter protected by removal from circuit—uses simple clamps



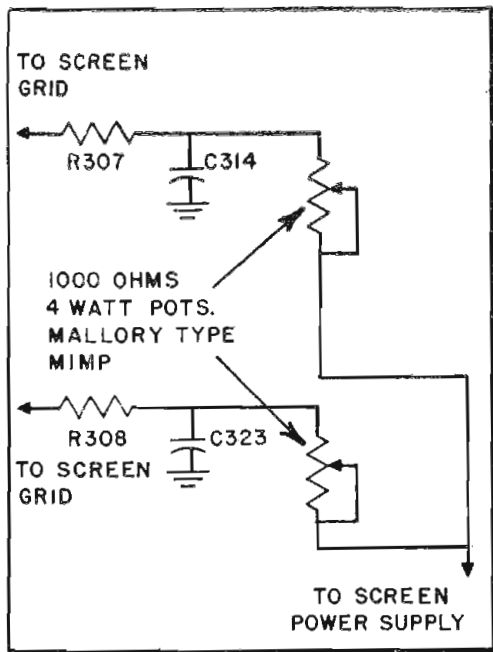
was obtained by the use of another set of wheels provided by the manufacturer. Changing these wheels everytime a different speed was necessary was unhandy at times when the change had to be made quickly.

We found by switching the motor speed switch from one position to the other and using the set of wheels with the large rubber covered pressure roller that either 33 $\frac{3}{4}$ " / sec. or 7 $\frac{1}{2}$ " / sec. could be obtained. Therefore, by merely moving the two speed motor switch to a convenient place on the outside, both speeds can be obtained by flipping the switch. We placed the switch in the vacant place just left of the control knob. With the switch in this convenient position, it is possible to change speeds easily and quickly, even when programs appear on the same tape in different speeds. Similarly, if a combination of 7 $\frac{1}{2}$ " / sec. and 15" / sec. is desired, the other capstan and pressure roller should be fitted (both approximately same size) and the choice of speeds determined by the switch.

### FM Transmitter Improvement

JOHN W. KELLER, JR., Chief Engineer, WKOK-WKOK-FM, Sunbury, Pa.

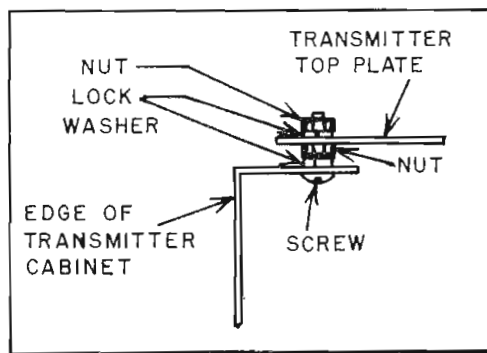
WE had trouble with internal arcing in the 5U4G rectifier tube that supplies voltage for the operation of the built-in oscilloscope on the exciter chassis of our RCA type BTF1C FM transmitter. This



Screen pots provide rapid means of matching 4-125A tubes in IPA stage of Xmitter was eliminated by replacing the 5U4G tube with a type 5R4GY tube. This tube is directly interchangeable with the 5U4G tube in this circuit. In the IPA stage of the transmitter, an unbalanced condition was

noticed, with one of the type 4-125A tubes operating hot while the other just "loafed" along. This condition can be corrected by carefully matching the tubes, but a much more satisfactory method is shown in Fig. 1. One 1000 ohm 4-watt potentiometer was installed, in series with each screen voltage supply lead to the tubes. With these, the screen voltage to each tube is adjusted for balance of the load. The two potentiometers were mounted on a 4 x 4 in. plate bolted to the bottom right-hand edge of the IPA compartment.

As it is necessary to remove the top of the transmitter to oil the doubler and IPA blower motors, the following change was made in the method by which the top was put



New method of fixing transmitter cabinet top permits easier access to blowers

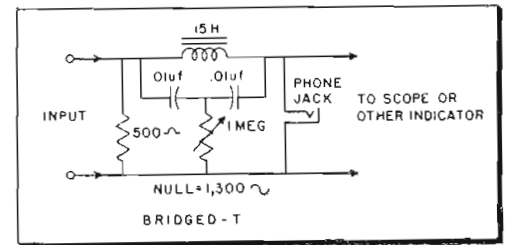
on, using another lock washer and nut. To remove the top, it is necessary only to remove the top nut and lock washer. You don't have to hunt around for screws that fall into the transmitter cabinet.

### Bridged-T Filter

T. R. ENGLAND, Chief Engineer, WMIK, Middlesboro, Ky.

FOR those stations not fortunate enough to possess their own distortion measuring equipment, a very useful, though simple, device is a bridged-T null network. It is capable of filtering out distortion products of about 0.1%! At WMIK we use this filter in conjunction with an audio oscillator to balance the modulators for lowest distortion, and to determine the type and relative amounts of distortion in various pieces of audio equipment.

The bridged-T is balanced by alternately varying the audio input frequency and resistance R until a null is obtained. At the null point the fundamental is completely suppressed, while distortion products and noise suffer negligible attenuation. With up to 45V. input, none of the fundamental could be detected in the output! We use an oscilloscope for a relative indicator so that the type as well as the amount of distortion can be checked, but any sort of



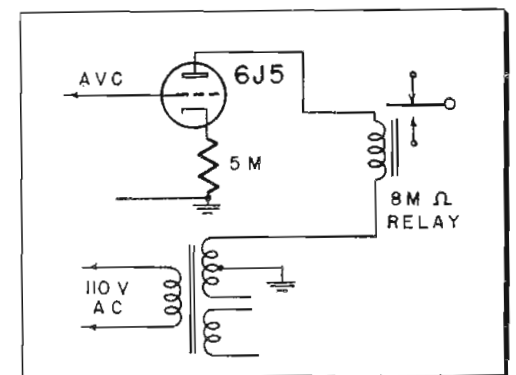
Bridged "T" null filter network doubles as bridge in balancing distortion checks

indicator that is sensitive enough could be used. A phone jack is provided for audio monitoring. The circuit shown balances at 1,300 C.P.S., and other condensers can be switched in to provide nulls at the lower and higher audio range for an over-all check. The coil is a 15 henry, 80 ohm filter choke. The 500 ohm resistor assures that all distortion products "see" the same impedance, for the impedance of the bridge itself is considerably higher than this value at all audio frequencies. The resistor also provides a match to most broadcast equipment.

### Low Cost Conelrad Warning

MIKE BATTLE, Chief Engineer, WOHI, East Liverpool, Ohio

WHEN the AVC cuts the tube off, no current flows through the relay and the armature is quiet. With the AVC removed, the strong rectified 60 cycle pulses cause the



Economy package Conelrad warning uses raw ac and relay to alert personnel.

relay armature to buzz very loudly. The cathode resistor size controls sensitivity. In most cases it will not be needed. Any available power transformer may be used.

### Console Modification

WILLIAM G. AHLES, WGET, Gettysburg, Pa.

HERE is a modification for feeding auxiliary speakers in an added studio, clients booth, lobby or offices etc. It uses a seldom used switch on the console plus the recording amplifier. Since auxiliary speakers are normally fed by the monitor amplifier, difficulty is often experienced in auditioning a program, cueing rec- (Continued on page 144)

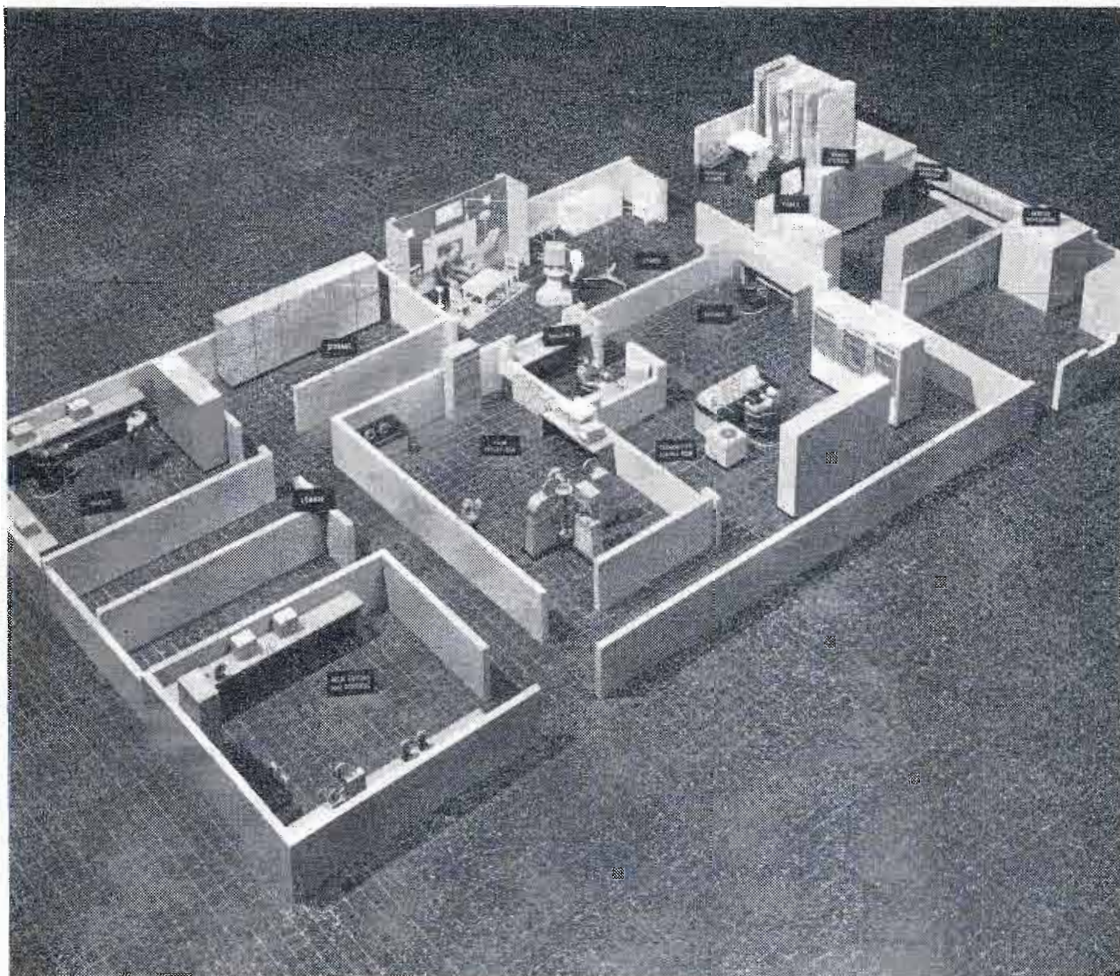


Fig. 6: Model layout of "A-Prime" station. Single-camera studio, prop and storage space is included

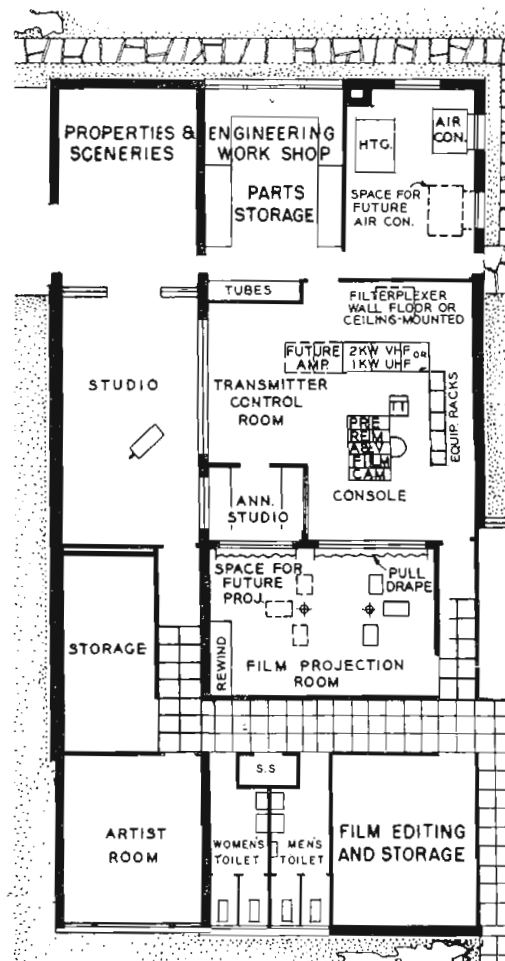


Fig. 7: Floor plan of "A-Prime" facilities

# TV Station Planning

**Technical and equipment considerations involved in establishing any one of four different sized television stations having "combined" studio-transmitter operations**

By L. E. ANDERSON & W. O. HADLOCK

Engineering Products Dept., RCA Victor Div., Radio Corp. of America, Camden, N.J.

## PART TWO of TWO PARTS

Part One of this article, published in the May 1953 issue of *TELE-TECH & ELECTRONIC INDUSTRIES*, describes the overall design and equipment considerations in planning a TV station, and details the construction of the smallest basic unit, the "A" plan. In this second and final part, the authors present plans for larger stations.

TV Station Plan "A-Prime" is practically identical to the "A" station, previously described. The major difference is the addition of a small, "single-camera" live talent studio together with the necessary space for properties and scenery handling plus an artist's room. Additional studio equipment required would consist of a camera, camera control, tripod and dolly, micro-

phones, microphone boom stand and necessary camera power supplies. Film projection room and film editing and storage facilities are the same as that of Plan "A." Plan "A-Prime" is suited for a "small community" station with the possibility of future growth to a larger studio such as included in Plan "B." Expansion can be made from "A-Prime" to Plan "B" with modest alterations and modifications. See Figs. 6, 7 and 8.

The facilities included in plan "A-Prime" provide all of the programming possibilities of "A" plus the handling of live programs. Thus, the following programs may be accommodated by Plan "A-Prime":

- (1) network
- (2) local film programs from 16mm projectors
- (3) local slide projection
- (4) test pattern from the monoscope camera and
- (5) small, local, live studio programs, announce pickups, simple

interviews and advertising sets. Announce booth, film projection room and film editing and storage facilities are identical to that described for Plan "A."

### Transmitter and Video Control Room

The central control room equipment facilities of "A-Prime" differ from those of "A" slightly through the addition of camera control section to the Audio/Video console to accommodate the single studio camera. Also, it will be noted that the engineers' quarters have been moved to the office area to provide additional space. This space can be utilized by the installation of a 10-kw transmitter. As in Plan "A", five equipment racks are used to house stabilizing amplifiers, power supplies, test, monitoring and audio equipment. However, if the budget permits, the installation of an extra rack will be repaid by the greater flexibility made possible in adding future equipment.

There may be "A-Prime" planners who will consider the provision

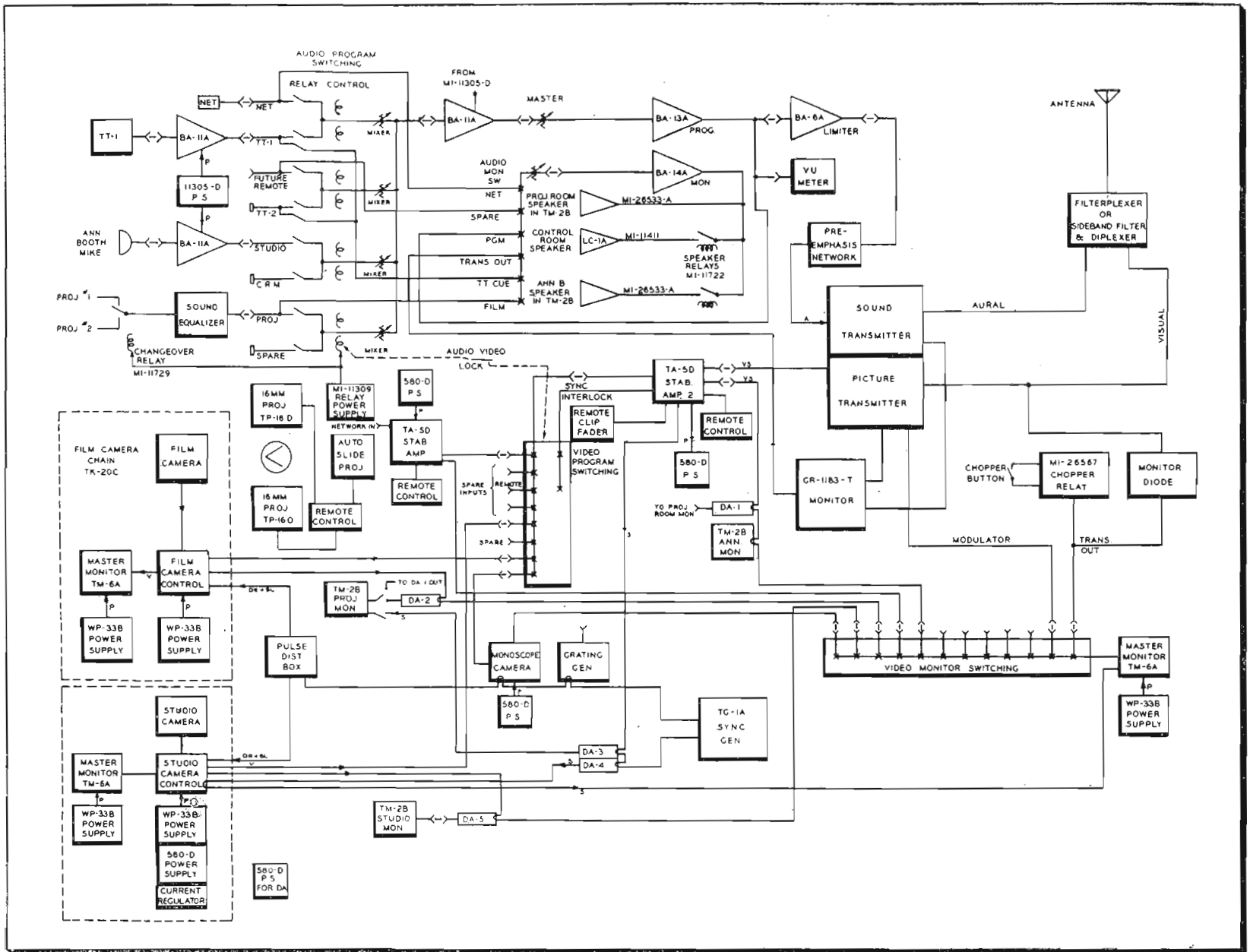


Fig. 8: System diagram illustrating interconnection of equipment shows how "A-Prime" plan accommodates film, network, slide and live programming

of fading, lap-dissolving and superposing in their programming facilities. This can be accomplished by adding the same equipment previously described in Plan "A." Although the addition of certain equipments has been recommended throughout this article and diagrams show what the system includes (as, for example, for fading and lap-dissolving or "Genlock" operation), the planner is cautioned that a system study should be made to determine if other equipment is needed to fully integrate the addition.

### TV Station Plan "B"

The Type "B" station layout is a prototype plan for a medium-sized operation. This plan can be an expansion of the "A" and "A-Prime" layout with the added refinement of a separate control room. It should be pointed out here that all of the "A" or "A-Prime" equipment has been retained to form the "B" or "Alternate B." Furthermore, it should be noted that field equipment may be used in place of the more permanent

studio type, especially if economy is a more important or limiting factor than the permanence or maximum flexibility attained with the two sets of studio camera equipment shown.

One further observation which applies principally to the "B" and "C" type stations shown in this article is

that there are many possible refinements from the standpoint of equipment which may be added, and some in which equipment may be omitted, dependent upon the programming needs, the final physical arrangement, and the economics involved. However, it should be remembered

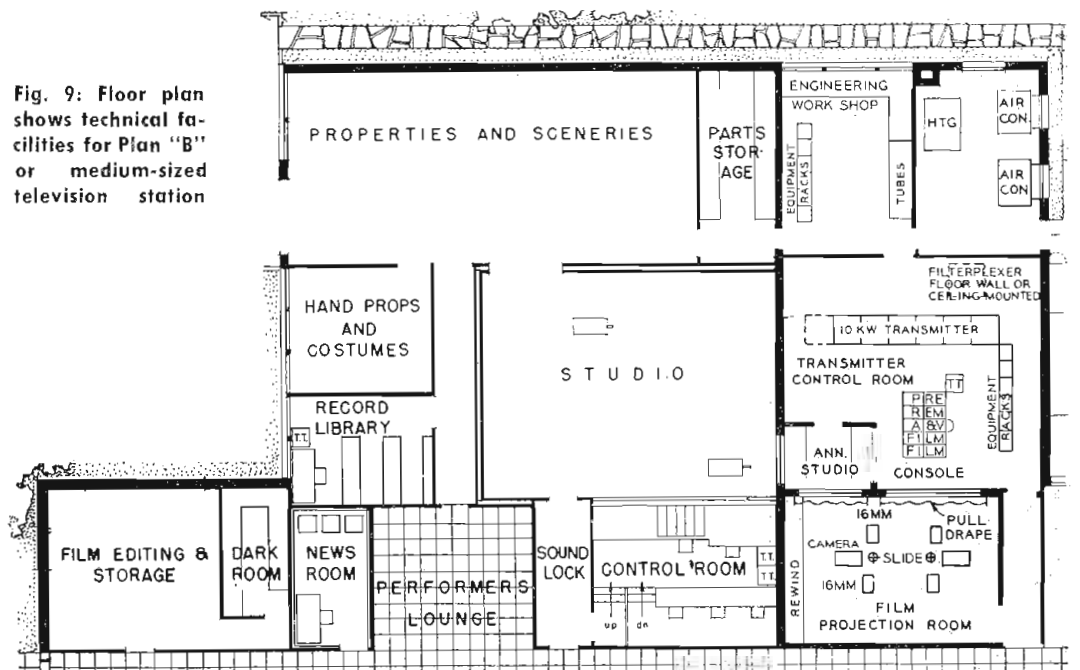


Fig. 9: Floor plan shows technical facilities for Plan "B" or medium-sized television station

# STATION PLANNING (Continued)

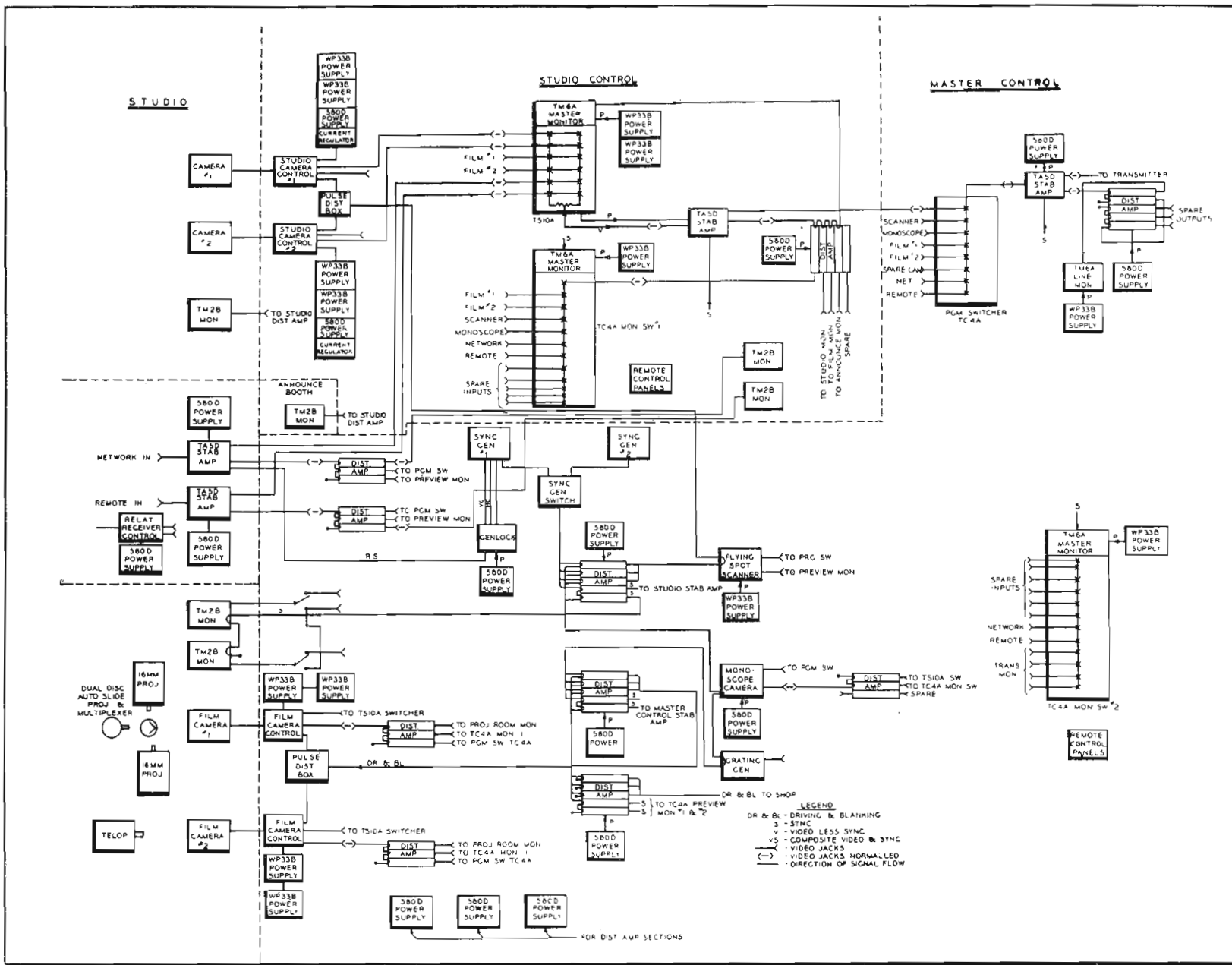
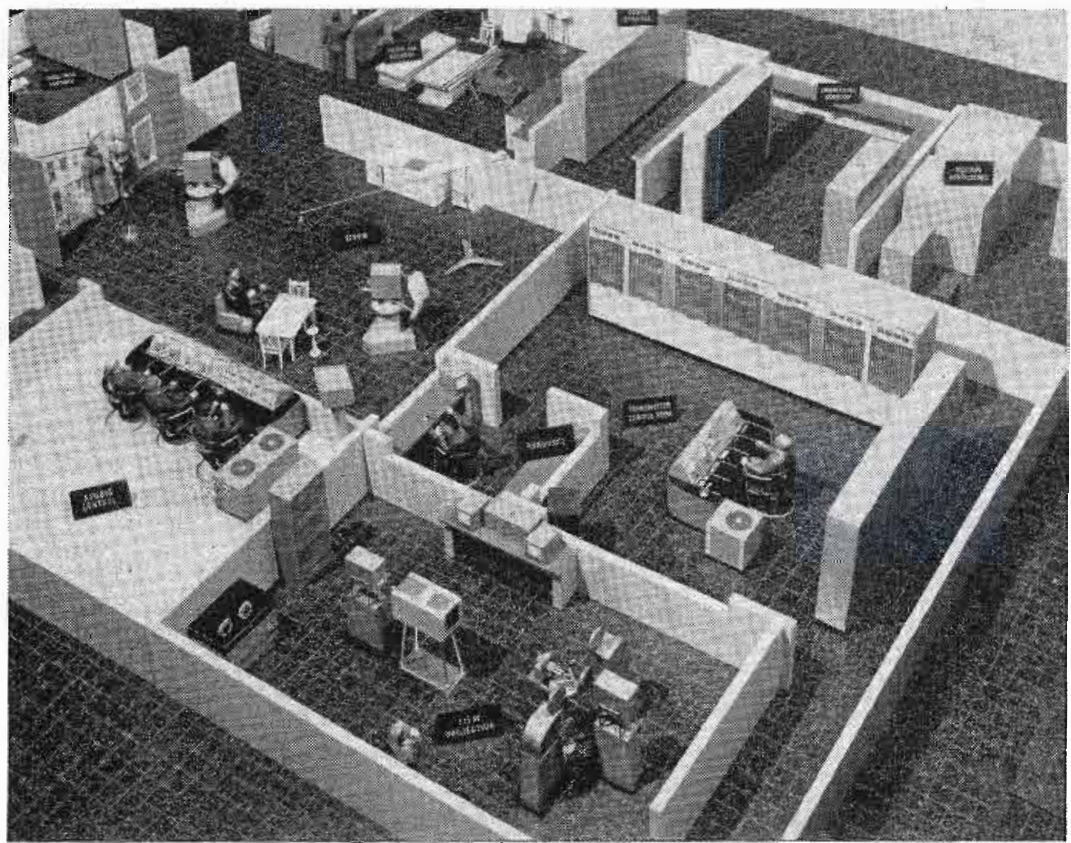


Fig. 10: Video system diagram showing interconnection of Plan "B" equipment. Audio components similar to Plan "A" are not included

Fig. 11: Close-up of portion of Plan "B" station showing center of technical activity. In studio control are (l to r) video operator, program director and audio operator. Note slide and film equipment



that each of the items of equipment illustrated in the functional diagrams serves a definite and useful purpose. See Fig. 9.

The functional diagram (Fig. 10) illustrates how plan "B" station provides the facilities necessary for broadcasting the following types of programs:

- (1) Local studio programs,
- (2) Standard 16-mm film entertainment and commercial film.
- (3) Slides, opaques and news releases,
- (4) Network programs,
- (5) Test pattern from the monoscope camera,
- (6) Remote programs picked up with portable field equipment (programs are sent back to the station by coaxial cable or microwave relay).

The facilities for the type "B" layout include: one average-sized, live talent studio with associated control room, a two-film camera projection room, an announce studio and



master control or transmitter control room. In some larger stations the film projection room may have its own associated control room, but in this plan the film camera controls are located in the transmitter control room which serves very well as a master control center. Video equipment racks are located in the centralized control room and in the engineering workshop.

**Film Equipment**

As in plans "A" and "A-Prime," the film facilities may again be regarded as a vital income producer of the station. It is, therefore, important that the projection room shall be all inclusive of the necessary film facilities. Almost any station of this size should have at least two film camera chains with a combination of two 16-mm projectors and a slide projector for one film camera, and a choice of additional 16-mm projectors, 35-mm projectors, slide projector or a Telop for the second film chain. Naturally these choices will be

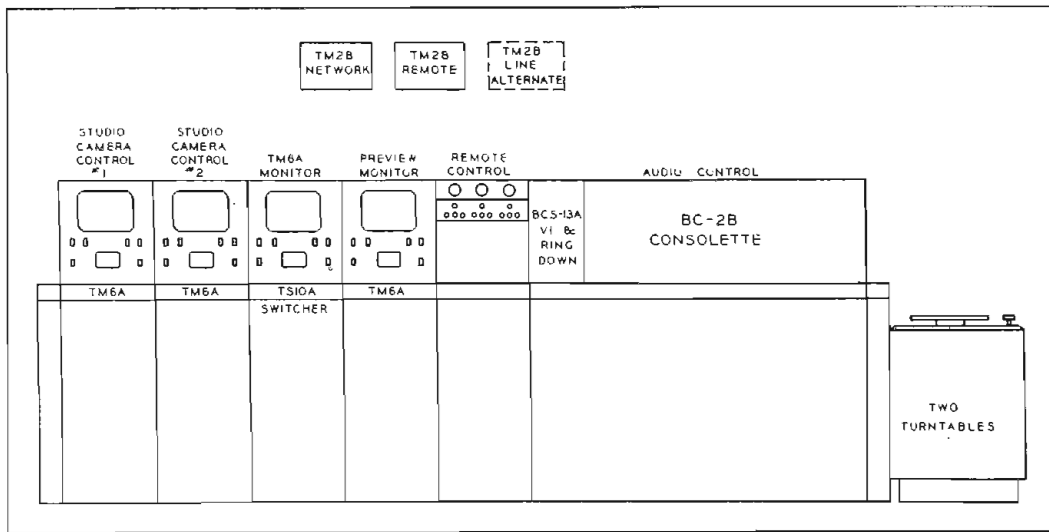


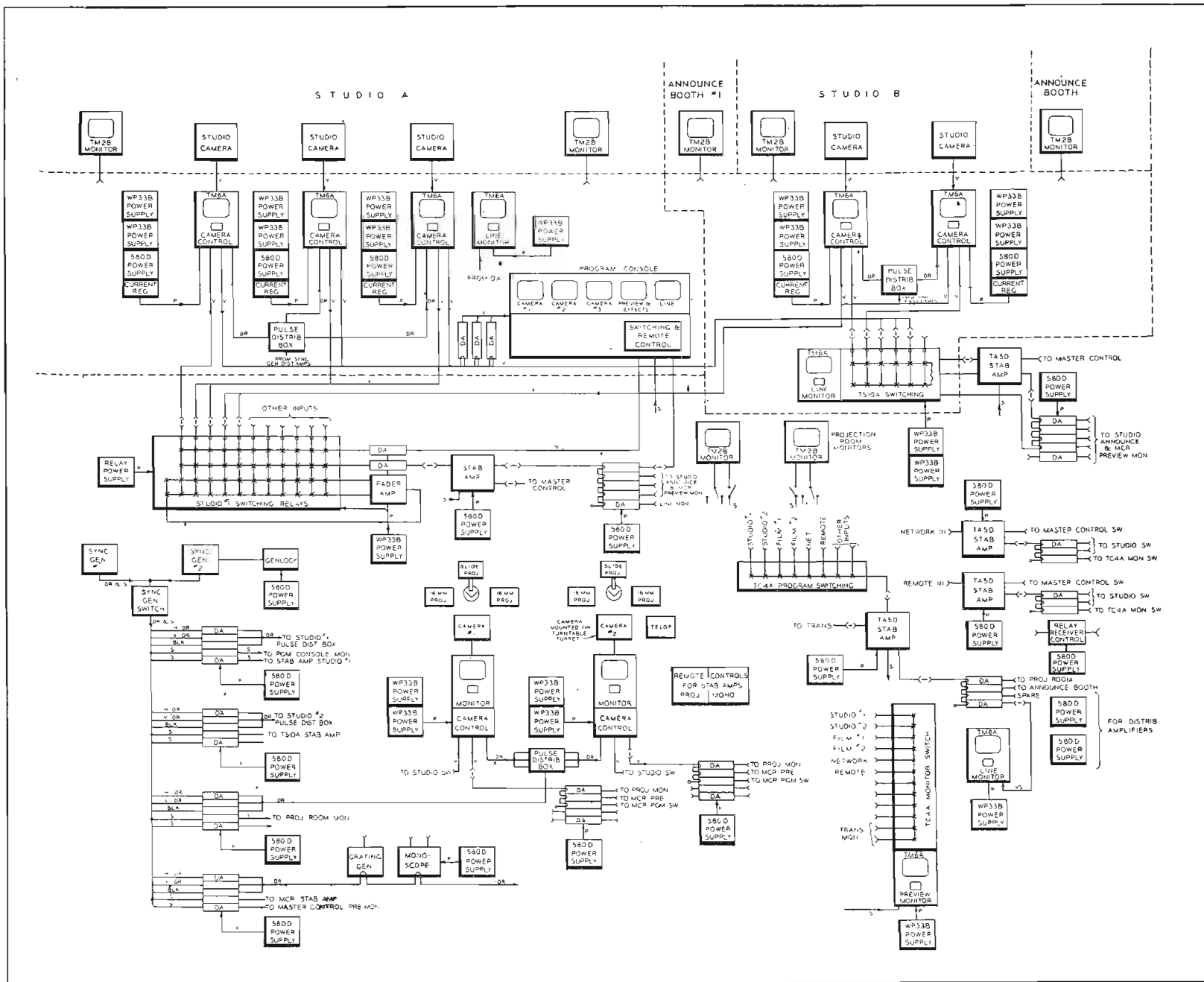
Fig. 12: Arrangement of audio, monitoring and switching in Plan "B" studio control room

dictated by the type and extent of programming the station plans to use. However, present operating techniques and costs invariably lead to an installation of at least two 16-mm projectors and a slide projector for one film chain, with local condition and personal choice providing the selection for the second camera. In some instances a third 16-mm pro-

jector has been installed and if this is planned, the appropriate extra space should be provided. See Fig. 11.

One important source for the second film camera would be the use of a Telop projector which makes use of 3 x 4 transparencies, opaques and news tape, and has a stage for handling small objects like watches and other jewelry pieces. To be able to

Fig. 13: Video system diagram of two-studio Plan "C" station. Audio components similar to those illustrated in "A-Prime" plan are not shown



## STATION PLANNING (Continued)

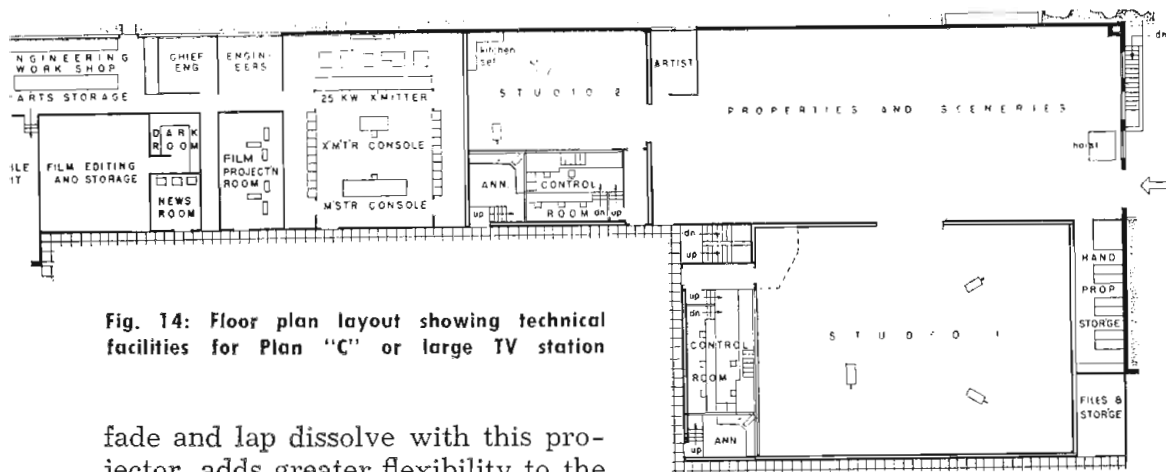


Fig. 14: Floor plan layout showing technical facilities for Plan "C" or large TV station

fade and lap dissolve with this projector, adds greater flexibility to the operation. The Gray Telop II projector will perform this function very well requiring a minimum of space and power.

The film projection room should be large enough to provide a work bench, with rewind facilities, film splicing equipment and film storage. Sufficient space should also be provided (as is done in plan "B") for a separate film editing room which is a tremendous asset. In this room, preview projectors, film storage cabinets, viewers and other supplemental storage and accessory equipment can be located. Serious consideration should also be given to providing a small dark room where local film processing and other photographic processes may be performed when the occasion demands.

### Studio Equipment

Equipment for the "B" plan studio consists of two complete image orthicon cameras plus the necessary lighting equipment and scenery for producing live talent shows. The cameras are complete with electronic view finders, studio type pedestals, video cue monitor and cueing speaker. The necessary microphones with program stand mountings and boom mountings are also included. In both "A-Prime" and "B," it is desirable to locate a utility monitor in the studio. Plan "B" studio can be utilized as a "three-scene" studio with the additional feature (also provided in Plan "A-Prime") of pointing a camera through the announce booth window for "disk-jockey," news or announce shows.

### Control Room Equipment

Fig. 12 shows the arrangement of the control equipment. Reading from left to right are the two studio camera controls, master monitors, switcher, preview monitor, remote control section, ringdown console, the audio consolette, and turntables. The remote control section houses the

controls for the stabilizing amplifiers, monoscope camera and projector control. Shown in the block diagram, above the operating console are two utility monitors. A third utility monitor is shown dotted in as an alternate.

Before describing the functions of the control room equipment, it should be noted here that the location of video consoles is a matter of personal choice dictated by the mode of operation preferred. For example, the program director may be seated on a raised platform directly behind the operating console where he can easily view all of the monitors and see into the studio as well. It is also possible to remove the switching unit from the line-up and place it on the program director's platform where the director may control the switching functions and also have "finger-tip" communication to cameras.

Remote starting of projectors at the program director's console may be accomplished by providing a remote control panel at this location. Control may be transferred to this point by the projectionist as soon as he has the projector loaded with film.

In either system, the video operator has control of the picture signals emanating from each studio camera. He maintains the proper shading and contrast. He may, in certain instances, perform the switching functions at the request of the program director. However, it is possible that the director may perform his own selection of signals and at the same time preview the signals on the adjacent monitors. The preview monitor switching in that case may have to be performed by the video operator, and the preview monitor should then be located to the right of the switching and fading unit for convenience. It is possible to preview network and remote signals on the switching and fading unit, but it is not always possible if local signals are fed into those positions. Further-

more, it is more desirable to keep one monitor on the outgoing signal at all times while previewing all signals on a separate monitor. In addition, it is also desirable to have a good waveform monitor for line and preview functions in order to adjust the video signal levels properly and correlate all readings to one unit as a standard. Therefore, the preview monitor is added, and all signals may be previewed on this monitor before they are switched on the air.

The console section, next in line, contains the remote control panels, which may regulate the functions of the stabilizing amplifiers, the monoscope camera, film projectors and slide projectors. Incidentally, this is an alternate position for these controls because in many instances it may be desirable to place them in master control. As a matter of fact, the projector controls may be located at both places; in which case, it is necessary to provide a switch that will transfer control to one location or the other.

### Audio Consolette

Next in the line is the audio consolette and the ringdown console. In most cases, it is well that the audio operator be in a position to see the studio clearly in order that he can properly ride gain, when the actors are moving about the studio.

A sufficient number of inputs, both video and audio, should be provided for studio projectors, turntables, announce, remote, and network signals. Where more than one studio is used, it is well to provide additional inputs for the second studio. The auxiliary mixer console, which is utilized in Plan "C," should be considered as a possibility for Plan "B" where the extensive use of microphones is planned.

Where requirements dictate a still more flexible switching system or where more than six video inputs are used, it is recommended that a relay switching system be considered. This is "Alternate B." Basically, it consists of the program console with its monitors, banks of momentary-contact push buttons and tally lights, and fader controls mounted on the console desk, plus associated rack-mounted equipment such as relay panels, fader amplifiers and stabilizing amplifiers. Signals from all cameras including monoscope test cameras, network and relay signals, when patched into the relay system, can be switched to master control. These local signals may also be lap-dissolved and faded.

The program director's console is  
(Continued on page 187)

# Page from an Engineer's Notebook

## No. 20 — Design Boners: I

By JOHN H. WYMAN, Chief Project Engineer, Bendix Aviation Corp., Eatontown, N. J.

A frequently overlooked circuit design factor is the ratio of peak current to average current in a rectifier. In a capacitor input circuit such as shown in Fig. 1, the instantaneous current at point I appears as in Fig. 2. Most rectifiers have a maximum peak plate current specified on the rating sheet. Exceeding this figure produces rapid deterioration of the cathode. The factors which determine the value of  $i$  peak are  $R_L$ ,  $C$  and the impedance of the tube and transformer. During each cycle as capacitor  $C$  starts to charge, the impedance of this capacitor is practically zero so that the sum of the impedance<sup>2</sup> of the transformer and the tube is the only limiting factor on this current. Thus, the tube will pass current up to the limit of the emission available from its cathode. This is a damaging condition of operation for a hot cathode vacuum device.

The cure is very simple. Limiting resistance should be added to the circuit to bring the peak current well within the maximum rated value as shown in Figs. 3 and 4.

Now the peak value will be reduced. Each application should be checked with a scope and  $R_x$  chosen to keep  $i_0$  as low as is consistent with ripple and other design requirements. For long reliable operation, it is desirable not to exceed 50 to 75% of the maximum  $i$  peak rating as a design center since line voltage variations may raise the value in actual use. In most applications a value of 100 to 150 ohms for  $R_x$  will provide this safety factor. This resistance also acts to prevent heavy surges during warmup and also to limit the "hot switching surge" if the equipment is turned off and on again immediately without allowing the cathode to cool off.

Equipment designers perhaps do

not realize that in all tubes there is a current which flows in the control grid circuit, small though it may be. This is a current caused chiefly by residual gas, leakage, and/or emission from #1 grid. Fig. 5. In some of the closely spaced high  $G_M$  triodes and in some beam tubes, applications have been made where less than adequate ventilation has been provided. Under these circumstances the total grid current could conceivably be as high as four or five microamperes. If this flows through a 1 meg. resistor, four or five volts may be developed across it in such a polarity as to reduce the bias on the tube and increase the plate current. This effect can be cumulative, destroying the tube in a short time.

Adequate cooling and a reduction of grid resistance to under 100,000 ohms are simple ways of eliminating such burnouts.

Fig. 1: Rectifier circuit with capacitor input has high instantaneous current at point I, causing rapid deterioration of the cathode

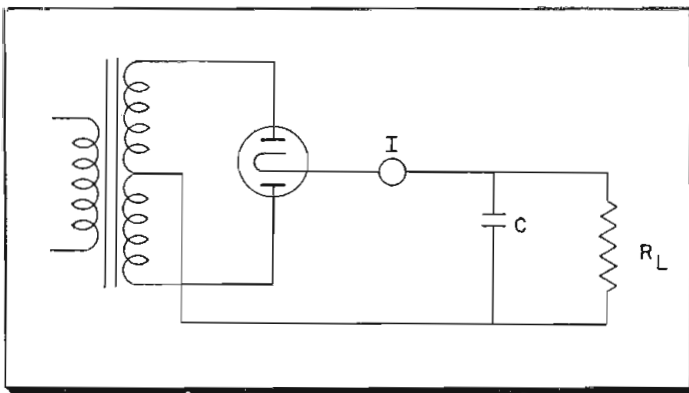


Fig. 2: (l) Instantaneous peak current at point I in Fig. 1 circuit  
Fig. 3: (r) Peak current kept within rating by limiting resistance

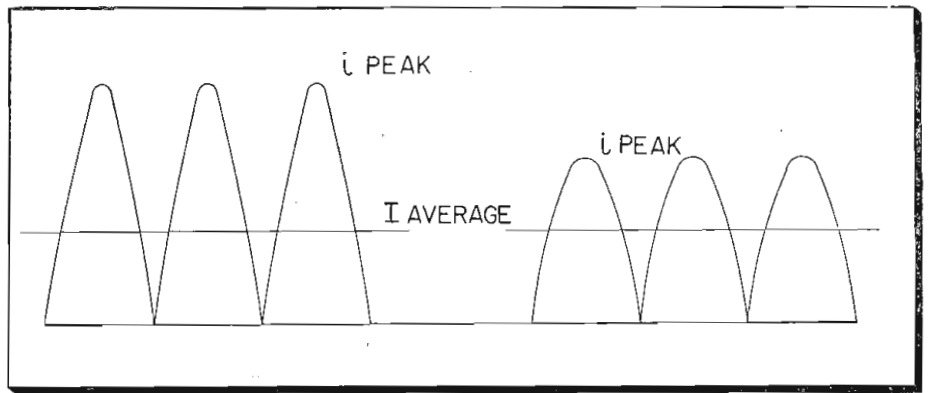


Fig. 4: Rectifier circuit with limiting resistor has current of Fig. 3

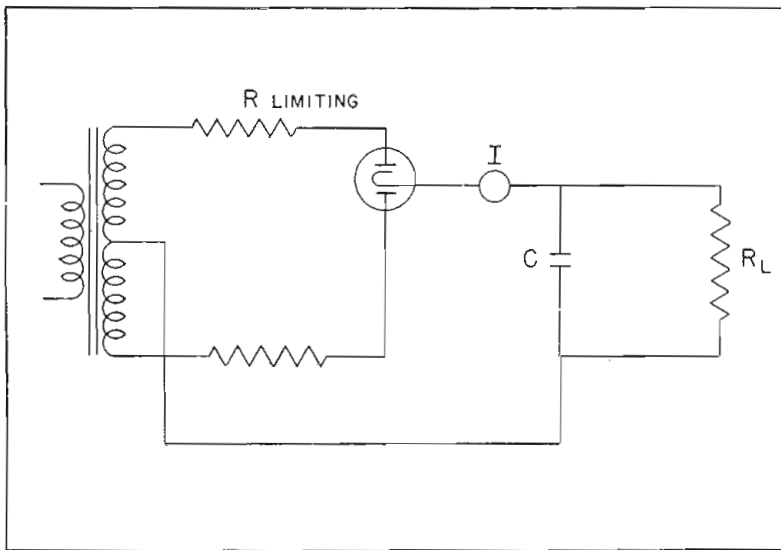
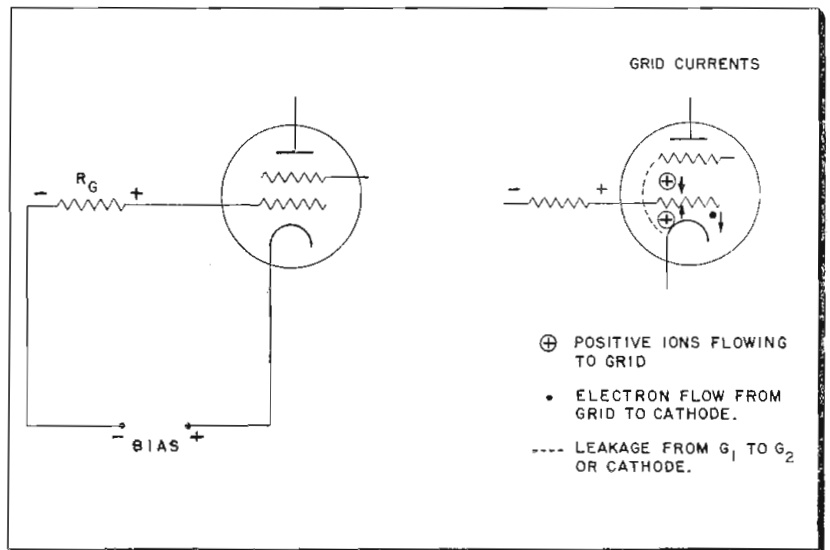


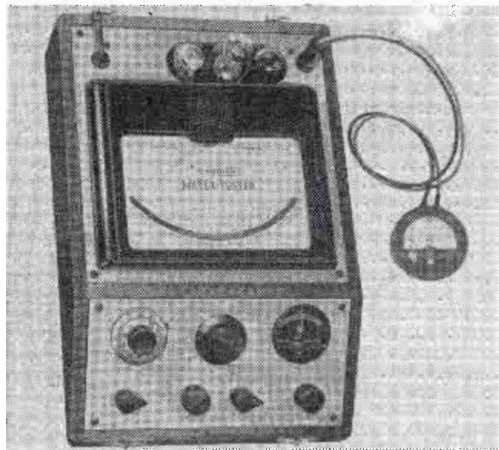
Fig. 5: Gas, leakage and grid emission cause destructive grid current



# New Equipment and Components

## Meter Tester

The new Marion Metertester, Model M-2, designed for testing and calibration dc laboratory and production line instruments



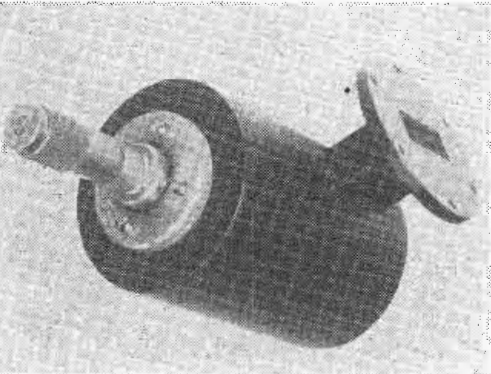
also measures internal resistance of sensitive instruments without exceeding the full scale rating of the instrument under test. The unit can be used as a precise source of dc current and voltage, and as a Wheatstone bridge in the 0-5000 ohms range; also, as a production limit bridge for the selection and test of resistance values from  $\pm 1/2\%$  to  $\pm 20\%$  over the range from 0-5000 ohms. It is the only instrument of its type. Features of the tester include: a regulated power supply; stepless vacuum tube voltage control; illuminated  $8\frac{1}{2}$  in. standard instrument hand-calibrated mirror-scale; Marion ruggedized null indicator movement for bridge balance indication; manganin wire-wound resistors with decade of 0.1% accuracy; direct-reading bridge circuit using Helipot. Range: 25UA full-scale to 10 ma full scale, and 0-100 v; overall accuracy better than  $1/4$  of 1%; resistance range, 0-5000 ohms; required power source, 115 v 60 cps ac. Supplied ready for use in a sturdy  $15\frac{1}{8} \times 10\frac{1}{8} \times 5\frac{3}{8}$  in. carrying case, and weighs 15 lbs.—Marion Electrical Instrument Co., Manchester, N. H.—TELE-TECH & ELECTRONIC INDUSTRIES

## Extended Tube Line

Receiving tube types 6AJ4, 6SN7GTA, and picture tube types 21AP4 and 21MP4 have been added to the Raytheon Line. 6AJ4 is a 9 pin miniature triode designed for grounded-grid amplifier use in UHF television receivers. 6SN7GTA is a dual triode for use as a combined vertical oscillator and vertical deflection amplifier in TV receivers. 21AP4 and 21MP4 are 21 in. metal envelope, rectangular-faced TV picture tubes employing frosted filter glass face plates that are magnetically focused and deflected.—Raytheon Mfg. Co., Receiving Tube Div., 55 Chapel St., Newton 58, Mass.—TELE-TECH & ELECTRONIC INDUSTRIES

## Reaction Cavity Wavemeter

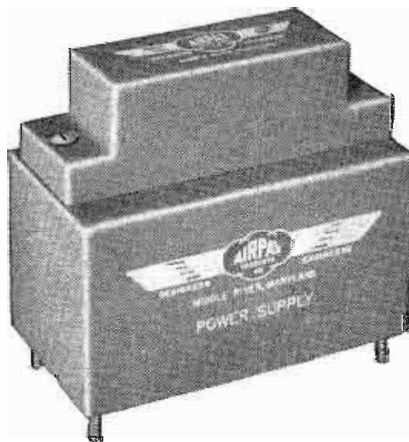
A reaction cavity wavemeter originally designed to operate at the high end of the RG-49/U waveguide (2x1 in.) has been redesigned to operate in the RG-50/U (1.5x 0.75 in.) waveguide between 5.3 and 6.5 Kmc. Input characteristics are similar to the standard DeMornay-Bonardi wavemeter with the exception of the frequency range of 5.3 Kmc. The redesigned instrument is hermetically sealed, nitrogen filled, and temperature compensated to better than  $2 \times 10^{-6}/^{\circ}\text{C}$ . Calibration accuracy and re-setability is 0.4 MC. Nominal loaded Q is 18,000 unless requested for pulsed op-



eration. Low power signals are supplied by a reflex Klystron inserted in a De Mornay-Bonardi tube mount specially developed for this service. Other standard instruments of the DB, RG-50/U line are now available in modified versions for operation between 5.3 and 5.9 Kmc. Specifications for each unit are identical to those of the corresponding regular unit of the RG-50/U series, except for the frequency range indicated in the DeMornay-Bonardi Catalog C2.—DeMornay-Bonardi Corp., 3223 Burton Ave., Burbank, Calif.—TELE-TECH & ELECTRONIC INDUSTRIES

## Power Supply

Model A-1220 vibrator power supply ( $4\frac{1}{4} \times 2\frac{3}{8} \times 3\frac{1}{8}$  in.) weighs only 1 lb., 14 oz. yet delivers 15 w., 150 v. dc, 100 ma. It is filtered



to 1% ripple, and has dc to dc efficiency of approx. 70%. Replaceable Vibrator has 450 CPS frequency, and is removable. Supply obtainable for 6, 12 or 26.5 dc input. On special order, from 4 to 110 input voltage, and outputs up to 20 w. and 300 v. can be furnished. Power supply will operate with 20% input voltage variation. No damage incurred from high humidity or altitude, and the internal temp. rise of  $38^{\circ}\text{C}$  permits a max. external ambient of  $75^{\circ}\text{C}$ .—Airpax Products Co., Middle River, Baltimore 20, Md.—TELE-TECH & ELECTRONIC INDUSTRIES

## Time Interval Meter

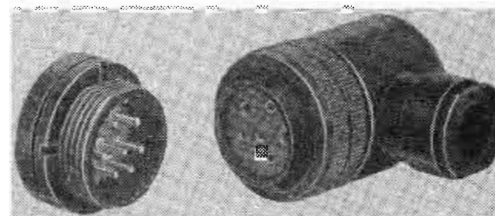
The model 5120 time interval meter provides a direct reading of elapsed time between any two events, in  $1\mu\text{sec}$  increments, to a max. of 1 sec. with an accuracy of  $\pm 1\mu\text{sec}$ ,  $\pm$ xtal drift. Any occurrence that can be translated into changing voltages may be so timed and timing may be started and stopped by independent voltages. The unit may be started and stopped by either positive or negative pulses by means of polarity selecting toggle sw. Attenuators permit selection of amplitude of start and stop voltages at optimum level for elimination of interference. Power is available from the "accessory socket" to operate various transducers. The time that digital reading is displayed can be controlled either manually or automatically up to a max. of 5 sec. The unit consists of a megc xtal osc, input circuits, an electronic gate, and six Berkeley decimal counting units. The first event or voltage opens the electronic gate and passes the 1 megc time base signal to the first cascaded decimal counting unit. The second event closes gate and the time interval between the two is then displayed in decimal form in increments of  $1\mu\text{sec}$ . Interpolation is unnecessary as the total number is read directly. Each digit of that number is indicated by the illumination of a single figure on each decimal counting unit.—Berkeley Scientific Div., Beckman Instruments, Inc., 2200 Wright Ave., Richmond, Calif.—TELE-TECH & ELECTRONIC INDUSTRIES

## New Transistor

Experience in vacuum sealing relays, transformers, capacitors, crystal holders, etc., has enabled L. L. Constantin and Company to design transistor mounts which allow the germanium block to be permanently sealed in either a vacuum or in inert gas. The new method is said to insure maximum stability against aging and prevent variations due to moisture, dirt, changing atmospheric or light conditions.—L. L. Constantin & Co., Lodi, N. J.—TELE-TECH & ELECTRONIC INDUSTRIES

## Miniature Connector

The new CR5-2-R pressure-tight multi-contact, miniature electrical connectors is now available for applications requiring



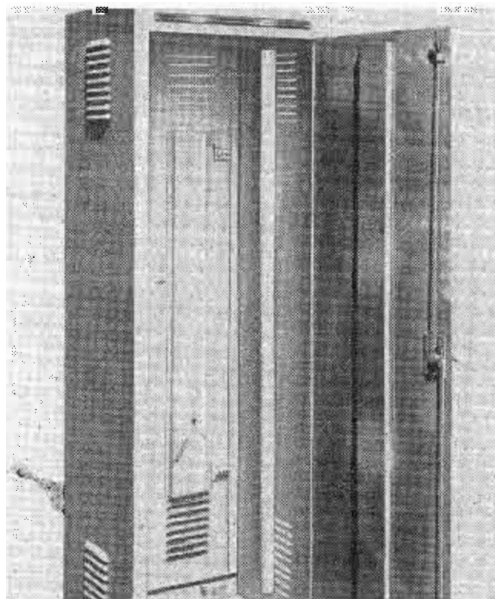
pressure-tight mechanical protection. Leakage less than 1 cu. in. hr. at 30 p.s.i. pressure differential. The CR5-2-R has neoprene seal rings around each contact and between the molded body and die-cast aluminum housing. Thus, positive sealing is assured and the contacts are allowed to float, precluding alignment difficulties. Positive contact polarization is effected by keyways in the shells. Overall dimensions are 1 in. max. dia. and  $1-\frac{1}{16}$  in. engaged length. Total weight of receptacle and plug is 2 oz. Five contacts for #20 A.W.G. and two for #18 A.W.G. wire are precision machined and gold plated over silver. Molded melamine body for high dielectric and "Monobloc" construction eliminates unnecessary creepage paths.—Winchester Electronics, Inc., Dept. M., Glenbrook, Conn.—TELE-TECH & ELECTRONIC INDUSTRIES

## Flat-Face Tubes

A series of flat-face cathode ray tubes have been specially designed to lessen parallax in radar displays and oscillographic installations. All are produced with magnetic deflection, but are available with either magnetic or electrostatic focus. High contrast is obtained by backing the conventional grey filter glass (Luxide) faceplate with aluminum. Except for flat faceplates, they are similar to 12UP4, 16AP4 16GP4 type picture bulbs. Three basic bulb sizes are available in any registered RTMA persistence value.—Rauland Corporation, 4245 N. Knox Ave., Chicago, Ill.—TELE-TECH & ELECTRONIC INDUSTRIES

## Transmitter Racks

Announcement is made of a line of welded 16 gauge steel transmitter racks finished in black or gray wrinkle. Tops

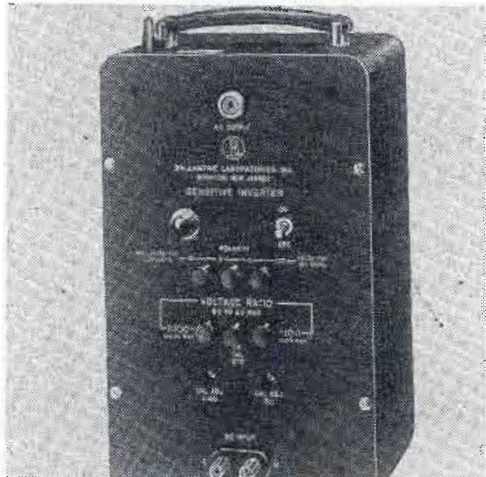


and bottoms have red striped chrome molding. Front doors have handles and 3 point locks. Panel mounting angles are  $\frac{1}{8}$  in. thick and tapped 12/24 on universal spacings. Rear doors hung on loose-jointed hinges have flush snap catches. The 12 gauge steel bottom has a rectangular lead cut-out. Racks are furnished with duplex receptacle and outlet boxes. Available in two sizes— $67\frac{3}{8} \times 22 \times 18$  in. with panel space of  $61\frac{1}{4} \times 19$  in. and  $83\frac{1}{8} \times 22 \times 18$  in. with panel space of  $77 \times 19$  in.—Premier Metal Products Co., 3160 Webster Avenue, Bronx, N. Y.—TELE-TECH & ELECTRONIC INDUSTRIES

# for Engineers and Designers

## Sensitive Inverter

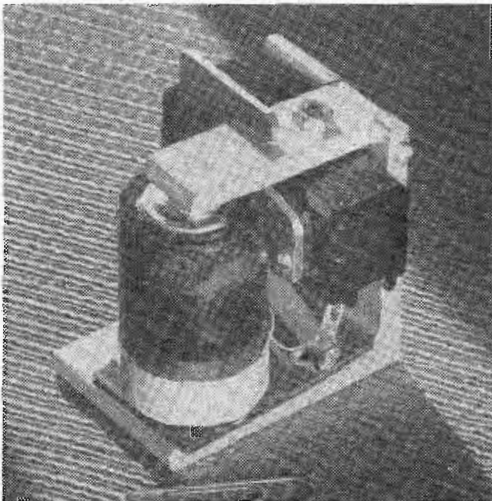
The model 700 in combination with a suitable 60 cps voltage sensitive device makes possible (1) the accurate measurement of dc



potentials as low as  $10\mu\text{v}$  and (2) the detection of dc potentials as low as  $1\mu\text{v}$  while presenting to the source a resistance not less than 10 meg. It may be combined with a vacuum tube voltmeter, voltage amplifier, oscilloscope, multimeter, servo-amplifier, or any other device sensitive to 60 cps voltages in the range  $100\mu\text{v}$  to 10 v. As a sensitive transducer the unit inverts dc potentials to ac voltages directly proportional in magnitude to the dc input voltages and phase sensitivity to the dc polarity. The inversion ratios (dc to ac rms) are 1:100 and 10:1. An important feature is a built-in calibrator which minimizes the errors caused by a companion instrument or by the departure of line frequency and voltage from nominal values. Other features include power sensitivity of  $10^{-18}$  watt; input resistance of 10 meg for inversion ratio 1:100 and 50 meg for 10:1; distortion-free 60 cps sine wave output; immunity to 60 cps pick-up voltages; and means for polarity sensing.—Ballantine Laboratories, Inc., Boonton, N. J.—TELE-TECH & ELECTRONIC INDUSTRIES

## Plate-Circuit Relay

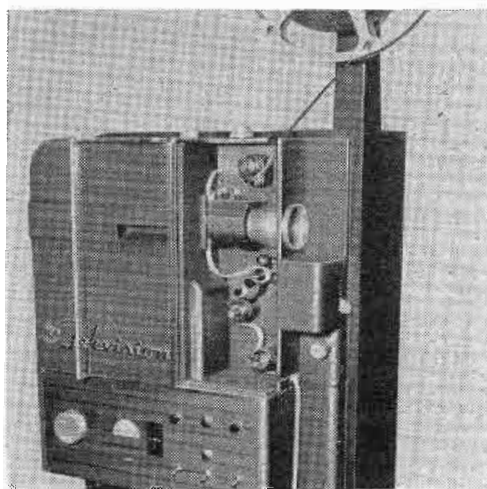
The new Belmont Type C snap-action relay developed to operate in the plate circuits of thyatron tubes as the type 2050, 2D21 and



502A, employs a type BA2R snap-action switch particularly suitable for inductive loads and high inrush currents. This single-pole contacts of the unit rated for 20 amp steady-state currents and 75 amp inrush voltage currents up to 460 volts ac can be wired for either normally-open or normally-closed conditions. The combination of extreme mechanical stability and large cross-section magnetic path makes the relay relatively insensitive to variations in operating voltage. The heavy movable lead is hinged into a section of annealed rolled-steel angle in the frame. An Allenhead screw, locknut and mechanical stop adjusts the gap. Performance can be varied from 8 to 12 ma pull-in and 2 to 6 ma drop-out current. The unit is designed to operate with a  $2\mu\text{f}$  bypass capacitor and has a standard actuating-coil 3000 ohms resistance.—Thermo Instruments Co., 1179 El Camino Real, Belmont, Calif.—TELE-TECH & ELECTRONIC INDUSTRIES

## 16 mm Film Projector

A newly engineered 16mm film projector incorporates the results of RCA research directed toward improving the broadcast quality of film TV programs. The improved RCA Type TP-6A has a new f/1.5 lens, framing system, dual focus arrangement, and a broadcast amplifier. To provide maximum operating convenience, the unit makes use of large 4000 ft. compensating take-up reels, a 2-3 intermittent operating in oil, and an automatic lamp change-over combine. The new instrument has a  $3\frac{1}{2}$  in., f/1.5 projection lens, a built-in iris control, and a companion condenser system with a built-in infra-red filter. The sound optics systems is the RCA's recording studio play-back equipment. A removable projection lamp house makes the equipment adaptable to gap or arc lamp operations, and its quick starting still frame projection stabilizes picture and sound in two seconds, and further aids threading and set-up, permits strip film projection, and reduces dead air time. An automatic change mechanism replaces a lamp in less than  $\frac{1}{4}$  sec. To prevent thermal shock failure, the filament is heated while moving into place. The TP-6A has a film speed of



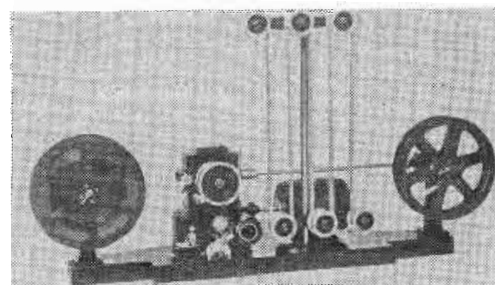
24 frames/sec., and a shutter speed of 60 frames/sec. The output impedance is either 150 or 600 ohms. The overall noise level of the system is -53 db. The projector operates from a 110-volt, 60 cps, single-phase power source. Separate motors govern the shutter, intermittent and sprocket, lower take-up, projection lens blower, exciter lamp, blower, and automatic lamp house. Excluding the upper reel and arm, the equipment is  $22\frac{1}{2}$  in. wide,  $13\frac{3}{8}$  in. deep, and  $54\frac{1}{4}$  in. high.—RCA Victor Div., Radio Corp. of America, Engrg. Products Dept., Camden, N. J.—TELE-TECH & ELECTRONIC INDUSTRIES

## Speaker-Driver Units

Two new explosion-proof speaker-driver units for high-quality indoor and outdoor public address and sound reinforcement in locations where inflammable liquids, gases, or dust creates explosion hazards, are announced by RCA Victor Division, Radio Corp. of America. Type MI-12461-1 is Underwriters' Lab., Inc. approved for use in the dyeing, dry cleaning, paint spraying, plastic, chemical, and gas manufacturing industries wherever inflammable liquids or gases are present. Type MI-12461-2 is approved for use in the flour, feed, grain, starch processing, coal pulverizing, and coal mining industries where dust, grain, or other foreign air particles are present. Both units provide excellent frequency response, have high power handling capacity, and assure good performance under difficult acoustic and climatic conditions. Both are watertight and weatherproof. They are equipped with Alnico V magnets and beryllium-copper voice coil leads. Both have peak power ratings 60 w. and a frequency response from 90 to 7,000 cps. Each unit is housed in a non-corrosive aluminum casting with a removable back cover plate, and weighs about  $15\frac{1}{2}$  lbs. A mounting bracket enables easy installation and wide variation in angular coverage. Each unit can be coupled to any straight or re-entrant horn.—RCA Victor Div., Radio Corp. of America, Camden 2, N. J.—TELE-TECH & ELECTRONIC INDUSTRIES

## Film Numbering Machine

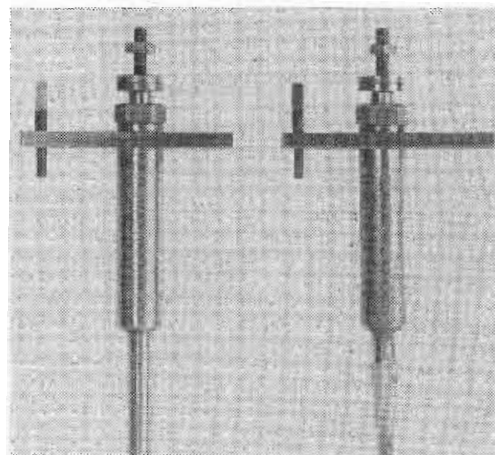
A visible edge film numbering machine in which an automatically operated metal numbering block prints the footage num-



ber on the film at each revolution of the sprocket has been placed on the market. The film, the movement of which is non-intermittent, subsequently passes over a series of drying rollers and elevators before being rewound. Machine capacity is 2000 ft. Printing speed is 50 ft/m. The 16 mm model prints between the perforations only, but the 35mm model can print between the perforations or on the outside edge. The standard 6-figure numbering bloc has either 2 handset and 4 automatic figure wheels, or 3 handset and 3 automatic. A bristle brush and felt pad are fitted to keep the numbering block clean. Both negative and positive films can be numbered. Supply coupling is by a special plug, suitable to take flexible tubing and a built-in switch is provided. A central lubricating point is provided for all working parts of the main mechanism. The various units are mounted on a cast aluminum base finished in bright black enamel and polished chromium plate.—S.O.S. Cinema Supply Corp., 602 W. 52 St., New York 19, N. Y.—TELE-TECH & ELECTRONIC INDUSTRIES

## Cutter

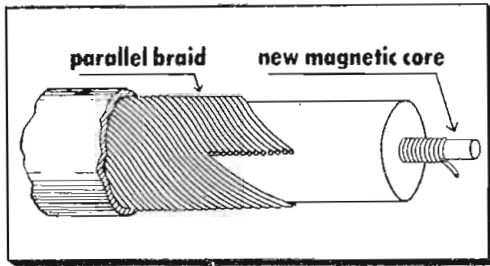
The No. 800 fly cutter cuts large circular holes in plastic, wood or metal panels up to  $\frac{1}{2}$  in. thick and is supplied with a tapered square shank for use with the ordinary carpenter's bit stock. The all steel cutter eliminates cutter gouging and blade interference. The slotted adjustable arm carries the cutting blade and straddles the hollow shank so that the blade remains on the same radial line. Hence, as adjustments are made for different hole diameters, the blade always approaches the work at the same angle and does not have to be re-sharpened or adjusted to cut at different diameters. The arm enables the unit to cut holes ranging from  $1\frac{1}{4}$  to  $5\frac{1}{4}$  in. in diam.



The hollow cutting head shank is reamed to a close running fit with a pilot pin. The pin is mounted in a center hole drilled through the panel. The entire cutting head is slipped over the pilot pin and is thus accurately held in position with its rotation center at right angles to the work plane. As the head rotates about the pin, the blade moves in a parallel plane to the work to produce a uniform cut. The blades are made of large cross section high-speed steel and long enough to allow many grindings. Each blade is keyed to assume its position when it is replaced after re-sharpening. An accessory, No. 802 extension arm, makes it possible to cut holes up to  $9\frac{1}{4}$  in. in dia.—Mico Instrument Co., 75 Trowbridge St., Cambridge, Mass.—TELE-TECH & ELECTRONIC INDUSTRIES

## High-Impedance Delay Cable

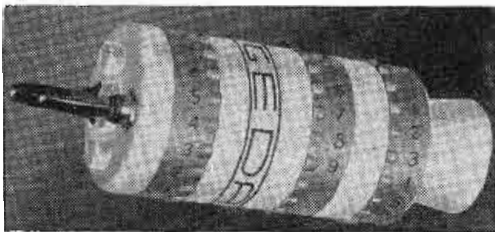
Type HH-2000 delay cable is designed to delay sine wave and pulse signals for periods from a fractional  $\mu\text{sec}$  to several  $\mu\text{secs}$ . Its primary application is in electronic cir-



uits in which minimum attenuation and signal distortion and fast rise time are required. The magnetic core (0.115 in. dia.) carries a closely coiled inner conductor of #32 AWG wire. An 0.285 in. dia. polyethylene spacer is over the helix. The spiral-wound outer conductors are held in place by an overlapping tape covered by a 0.405 in. O.D. polyvinyl chloride jacket. The HH-2000 is very flexible and is easily laid around bends or coiled. Standard AN type connectors can be used to terminate the cable. Time delay is 0.11  $\mu\text{secs}/\text{ft}$ ., and characteristic impedance is 2200 ohms. The attenuation for a delay of one  $\mu\text{sec}$ . is practically zero up to 3 MC, 0.5 db at 5 MC, and 2.5 db at 10 MC. The bandwidth (3 db down) for a delay of one  $\mu\text{sec}$ . is more than 0-10 MC, and correspondingly larger for smaller time delays. Compared to the commonly used RG-65/U cable, HH-2000 requires about two thirds less cable length for a given delay, and its attenuation is a small fraction of that of RG-65/U. The capacitance per foot is 47  $\mu\text{mf}$  and the dc resistance is 7.7 ohms/ft. Maximum operating voltage is 2000 r.m.s. HH-2000 can be supplied in 100/ft. lengths or in pre-calibrated sections.—Columbia Technical Corp., 5 E. 57 St., New York 22, N. Y.—TELE-TECH & ELECTRONIC INDUSTRIES

## Decade Resistance Unit

A plug-in decade resistance unit is available in two types: with maximum resistance value of 10.6 ohms; and a maximum resistance value of 10.7 ohms. Each model has



three dials showing the set resistance value to within 1%. The top dial controls a pot, which enables the unit to be set to within 0.1% of any range value using a suitable resistance bridge. Units supplied with the manufacturer's L3 Geda permit the constant coefficients to be easily set and stored on the removable problem board. Parameter values thereby are retained when the problem board is taken from the machine for temporary storage. A jack at the top of the unit enables connection to duplicate units or to other analog-computer circuits. The unit plugs into the problem board by two banana plugs at the bottom of the unit. These plugs are on standard  $\frac{3}{4}$  in. centers.—Goodyear Aircraft Corp., Akron, Ohio—TELE-TECH & ELECTRONIC INDUSTRIES

## Video Delay Lines

A new line of miniature and sub-miniature video delay lines is being produced that feature small size, good electrical characteristics and ease of mounting on resistor boards by means of pigtail leads. Two standard lines are being manufactured with the following characteristics: subminiature, "Develco" D5Z10R1-5; delay, 0.5  $\mu\text{sec}$ .; impedance, 1000 ohms; insertion loss less than 1 db; rise time less than 0.15  $\mu\text{sec}$ .; dim.,  $1\frac{1}{2} \times \frac{7}{8}$  in. dia. Miniature, "Develco" D5Z5R-1; delay 0.5  $\mu\text{sec}$ ., impedance, 500 ohms; insertion loss less than 1 db; rise time less than 0.1  $\mu\text{sec}$ .; dim  $3\frac{1}{2} \times \frac{7}{8} \times \frac{3}{8}$  in. Standard tolerances,  $\pm 10\%$ . Delay tolerances of 5% and 2% at slight additional cost. Lines may be safely operated at temperatures exceeding the range  $-55^\circ\text{C}$  to  $+125^\circ\text{C}$ . The manufacturer is equipped to produce this type of delay line in a variety of package sizes and hermetically sealed

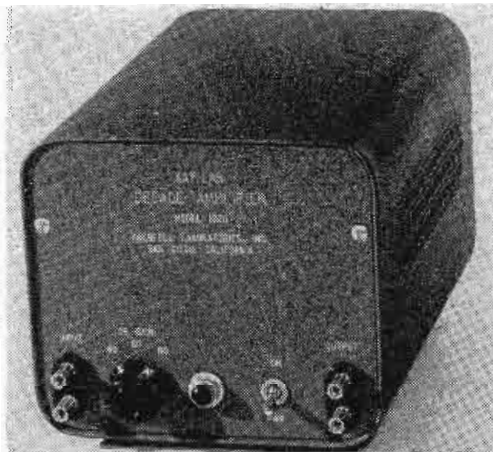
containers and to specified electrical characteristics. Taps can be furnished on most lines at any specified points. Total delay times range from zero to twenty  $\mu\text{secs}$ . and while impedances of 500 and 1000 ohms are standard.—Developmental Electronics Corp., 4213 South Broadway, Los Angeles, Calif.—TELE-TECH & ELECTRONIC INDUSTRIES

## Self-Timing Leader Tape

An improved leader and timing tape made of strong, durable white plastic material can be marked with pencil or ink. Used with standard  $\frac{1}{4}$  in. magnetic recording tape, it serves as a threading leader, protective outer wrap for tape on reel, and as a spacer for identification and spotting of recorded selections within the reel. Spaced markings  $7\frac{1}{2}$  in. apart provide a simple method of timing at all standard tape speeds. It is said to outlast paper tapes many times over. The material is available in 150-ft. rolls, and packaged individually in a self-dispensing container.—Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.—TELE-TECH & ELECTRONIC INDUSTRIES

## Decade Amplifier

The Kay-Lab decade amplifier is a general purpose pre-amplifier with stabilized gains of 40 db and 60 db, and maximum gain of approximately 80 db. A principal feature is a



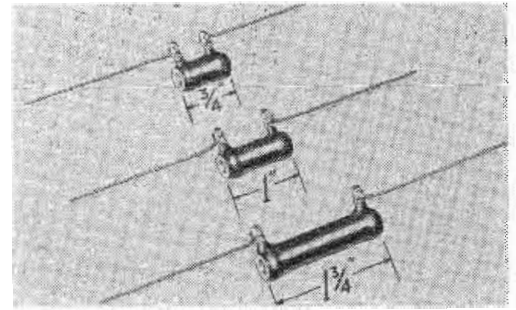
very low hum and noise output for a gain switching amplifier. Amplifier gain is switched rather than employing an input cathode follower and compensating attenuator. There is no dependence upon compensating capacitors. Another feature is the high output voltage which, in conjunction with low noise, permits a very wide dynamic range. The electronic regulated power supply guarantees high amplifier stability and excellent regulation against transient and gradual line voltage changes. Gain: 40, 60, or 80 db selected by panel switch. Feedback on 40 and 60 db range is in excess of 20 db. Gain on 80 db range is between 79 and 82 db. Max. output: 50 v. rms into 20 k ohms or higher load; 40 v. rms into 5 k ohms load; 10 ma. rms current into low impedance. Frequency response: through 1,000,000 cps. Output impedance: approx. 10 ohms, in series with 20  $\mu\text{f}$  on 40 and 60 db ranges. Approximately 100 ohms in series with 20  $\mu\text{f}$  on 80 db range. Hum and noise: measured with input terminal shorted, 40 db range less than 30  $\mu\text{v}$  referenced to input. 60 db range less than 20  $\mu\text{v}$ . Input impedance: 3 meg-ohms shunted by 10  $\mu\text{mf}$  capacity. Power supply: high gain, low noise, low output impedance, regulated supply for maximum stability and low noise from amplifier output. Power requirements: 105 to 125 v., 60 cps, 75 w. Physical dimensions: 8 x 7 x 12 in., 25 lbs.—Kalbfell Labs., Inc., 1090 Morena Blvd., San Diego 10, Calif.—TELE-TECH & ELECTRONIC INDUSTRIES

## Printed Circuit Plier

Two new pliers that meet the specialized needs of printed circuit wiring have special fitted knives that shear and crimp wire in one operation. The crimp holds loose parts in position and enables fast, efficient dip-soldering of the exposed wire ends. When the pliers are held in the upright position, the  $45^\circ$  working angle of its knives keeps the shearing-crimping operation in view. A replaceable tempered steel spring keeps the plier in open position ready for use. The new tools are forged from high-grade tool steel. Over-all length is approx. 5 in.—Mathias Klein & Sons, 3200 Belmont Ave., Chicago 18, Ill.—TELE-TECH & ELECTRONIC INDUSTRIES

## Enamel-Coated Resistors

A new line of enamel-coated power resistors is unaffected by moisture. The small size and low wattage of these resistors make them ideal for applications in TV chassis



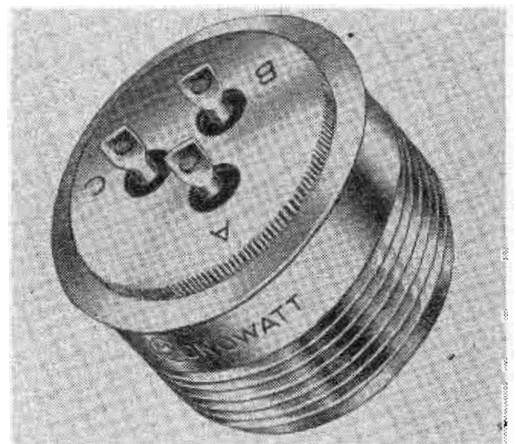
confined areas as well as radio equipment. The core of the new resistors is identical with Mallory vitreous enamel resistors and provides optimum electrical characteristics, great physical strength and a low expansion coefficient. The low temperature coefficient wire assures stable resistance values over the entire operating range. The expansion characteristics of the components are matched to produce a unit impervious to thermal shock and moisture. The new resistors are currently available in three sizes and wattage ratings: 3 w., 10 to 5,000 ohms, 3.4 in. long; 5 w., 10 to 10,000 ohms, 1 in. long; 10 w. 25 to 25,000 ohms,  $1\frac{3}{4}$  in. long.—P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis, Ind.—TELE-TECH & ELECTRONIC INDUSTRIES

## Quartz Crystals

Tube manufacturing techniques have been adapted to precision crystals. The manufacturer features two models in hermetically sealed glass holders. Both are wire mounted in a 6V6GT envelope with an octal base and are available with gold or silver plated crystals. The G-9J has a frequency range from 1.2 to 10 KC. It has a frequency tolerance of  $\pm 0.3\%$  at  $-40^\circ$  to  $+70^\circ\text{C}$ . and a capacity ratio of approx. 200. Model G-9 with a frequency range of 5 to 200 KC has a frequency tolerance of  $\pm .02\%$  or better at  $-40^\circ$  to  $70^\circ\text{C}$ . The capacity ratio ranges from approximately 1000 to 200. Either model is available within a varied range of frequencies and characteristics.—James Knights Co., Sandwich, Ill.—TELE-TECH & ELECTRONIC INDUSTRIES

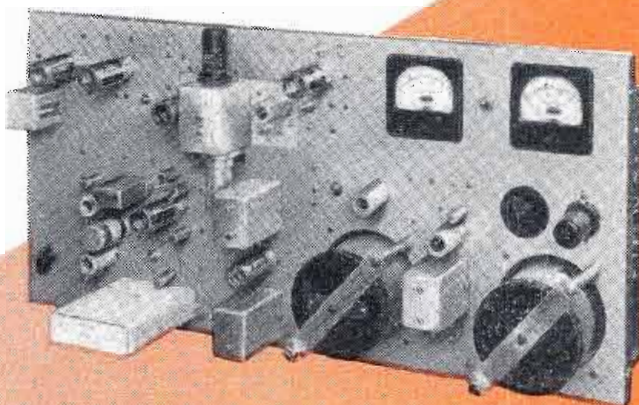
## Hermetically Sealed Connectors

M-750 Series hermetically-sealed connectors withstand mechanical shock of 100 G's, thermal shock from  $500^\circ\text{F}$ . in oil to the temperature of liquid air, temperatures as high



as  $1500^\circ\text{F}$ . (e.g., when connectors are welded to instrument housings), and a voltage breakdown of over 1,000 v. They are impervious to moisture, corrosion (salt, acid, oil, etc.), rare atmosphere, high pressure, fungus, and vibration. One connector end mates with standard AN (MIL) types; the other has a tapered, serrated surface, so the device can be pressed into instrument housing and mechanically anchored. The strength of the mechanical anchor and the high-melting temperature of hard-glass insulation enables the use of any common method of bonding it—soft solder to welding—without special assembly jigs and staking tools, and without danger of breaking or melting the seal.—Monowatt Dept., General Electric Co., 95 Hathaway St., Providence 7, R. I.—TELE-TECH & ELECTRONIC INDUSTRIES

*pre-planned  
for future  
power growth*



*plus...*

A marked advance in circuit simplification. Fewer tubes, less cabinet space, and better performance result from the use of common circuitry for both visual and aural exciters.



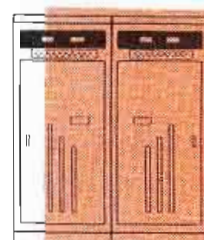
*plus...*

Air-cooled tetrode as final output. Tube operates as Class B and has an output of a level of 1 KW peak. Extra-heavy, well constructed cavity minimizing warpage. Results in greater cavity stability.

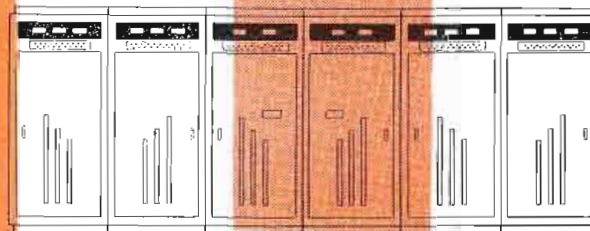
*plus...*



The Du Mont UHF Antenna has a power gain of 14 to 25. Vertical beam approaches within 6 db of the ideal cosecant curve for uniform coverage. Will handle up to limit of transmission line power capacity. Rugged, simple, reliable power. 2 bay, 24 wavelength sections.



In addition to the immediate operational advantages of the Du Mont 1 KW UHF transmitter, provision is made for future power expansion. The original driver may be utilized to drive a klystron amplifier for a power output of 100 KW, ERP.

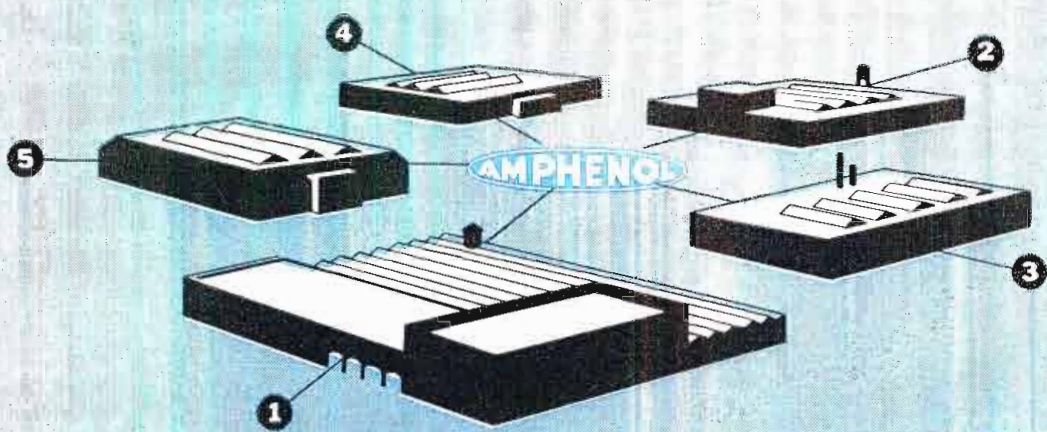


The 1 KW amplifier may be used in turn to drive even higher units up to 1000 KW, ERP. Thus in UHF, as in VHF, the broadcaster can grow from Acorn to Oak power — with Du Mont.

**DU MONT<sup>®</sup>**

TELEVISION TRANSMITTER DIVISION

ALLEN B. DU MONT LABORATORIES, INC.  
CLIFTON, N. J.



## from AMPHENOL'S 5 PLANTS

... Come quality components for the electronics industry. AN Connectors, RF Connectors, RG Cables, literally thousands of cataloged parts are being supplied by AMPHENOL to Radio-Electronics manufacturers. And matching a steadily mounting demand for these parts is the increased production of AMPHENOL's five plants. What are the reasons for this demand? Why is AMPHENOL constantly expanding? The answers to these questions are evident to the Electronics industry. They know, first, that behind each part supplied by AMPHENOL stands an unrivaled reputation for *integrity*. Firms that have been customers for twenty years or those that have only recently begun to buy from AMPHENOL recognize this and rely upon it. They know, also, that a direct result of this is the recognized *quality* of AMPHENOL components, parts manufactured of premium material. The *ingenuity* of the AMPHENOL engineering staff—the ability to come up with solutions to seemingly insolvable problems—is well known. Whether it is the engineering of a totally new component or the modification of an existing one, these electronics specialists provide valuable help to industry. *Integrity, quality, ingenuity*, all reasons why the road of confident buying leads, and always has led, to AMPHENOL.



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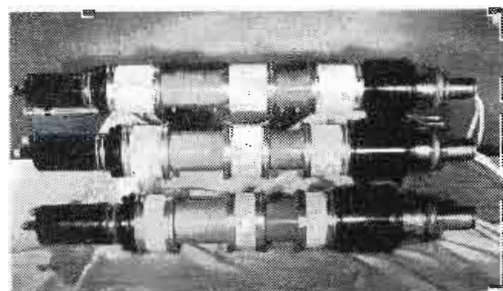
"Building to the Future of Electronics"

### Klystrons

The cascade type Eimac 3K20,000L 5kw klystrons for UHF-TV transmitters come in a series of three that will cover the entire UHF TV spectrum from 470 to 890 MC as follows:

Type No.	Frequency Range	UHF Channels
3K20,000LA	470-580 MC	14-32
3K20,000LF	580-720 MC	33-55
3K20,000LK	720-890 MC	56-83

The size, weight (45 lbs.), and versatility of these practical klystrons minimize stockpiling, mass production, and equipment design. Typically these units operate at a peak sync power output of 5.5 kw with a power gain of 20 to 25 db and collector dissipation of 14 kw. All types have low-loss, externally tuned ceramic cavities and metal-to-ceramic seals. Cavities are readily cooled by a small amount of forced air; the balance of the



tube is water-cooled.—Eitel-McCullough, Inc., Application Engineering Dept., San Bruno, Calif.—TELE-TECH & ELECTRONIC INDUSTRIES

### Decade Resistor

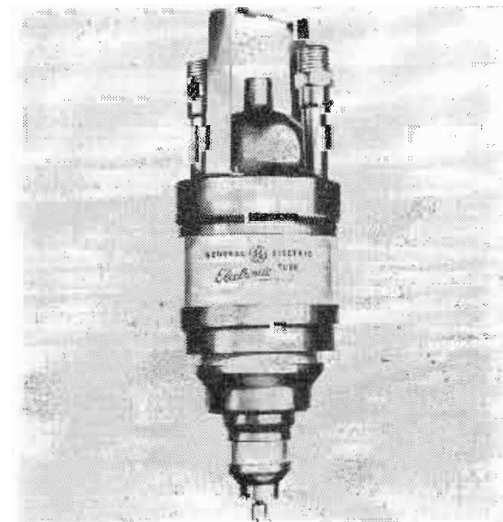
Wide range decade resistor Model 7 for laboratories aids determination of proper RTMA resistance values. Unusual range covers 10 ohms to 8.2 meg, in 20% steps (72 values) with 2-watt rating. Precision deposited-carbon resistors provide 2.5% accuracy. Compact unit measures 4.5 x 7.25 x



4.5 in., has phenolic insulation at terminals, and uses two knobs on sloping panel to control positive detent action switches. Price is \$47.50.—Rochester Electronics Co., Inc., P. O. Box 227, Penfield, N.Y.—TELE-TECH & ELECTRONIC INDUSTRIES

### Five KW Power Tetrode

The newest and most powerful addition to the GE line of ceramic-and-metal envelope transmitting tubes, type GL-6182, five-kilowatt power tetrode is designed to operate over the entire ultra-high-frequency spectrum and operate at seal temperatures as high as 200 C. The GL-6182 is designed for

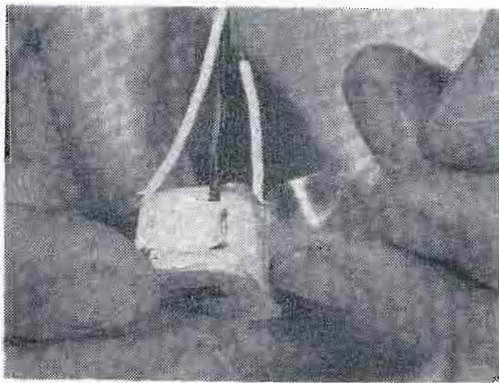




use as a broadband amplifier in Class B television service; also as a Class C amplifier or oscillator in grounded-grid circuits with both grids at r-f ground potential. As a grounded-grid circuit r-f amplifier in Class B television service, up to 900 MC in a six-MC bandwidth, typical GL-6182 operating conditions are: d-c plate voltage, 8 mv; d-c grid No. 2 voltage, 600 v; d-c plate current, 1.3 a., synchronizing level; d-c grid No. 2 current, pedestal level, 0.090 a.; d-c grid No. 1 current, 0.30 a., synchronizing level; driving power at tube, 300 w., synchronizing level; power output 5 kw, synchronizing level.—General Electric Co., Tube Dept., Schenectady 5, N. Y.—TELE-TECH & ELECTRONIC INDUSTRIES

### Polyester Electrical Insulating Tape

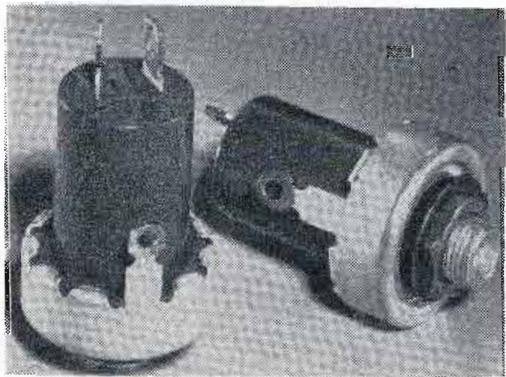
A new transparent tape, "Scotch" electrical tape No. 5, has a polyester film backing made from du Pont "Mylar" and a pressure-sensitive, heat-resistant, electrical grade adhesive. Only 3 mils thick, the new material combines high tear strength with high dielectric and non-corrosive properties. Stable under temperatures up to 125°C, the tape is designed for use in fine wire coils, transformers, and miniature electric components. As it is not subject to cold flow, it can be used to edge electric motor slot lin-



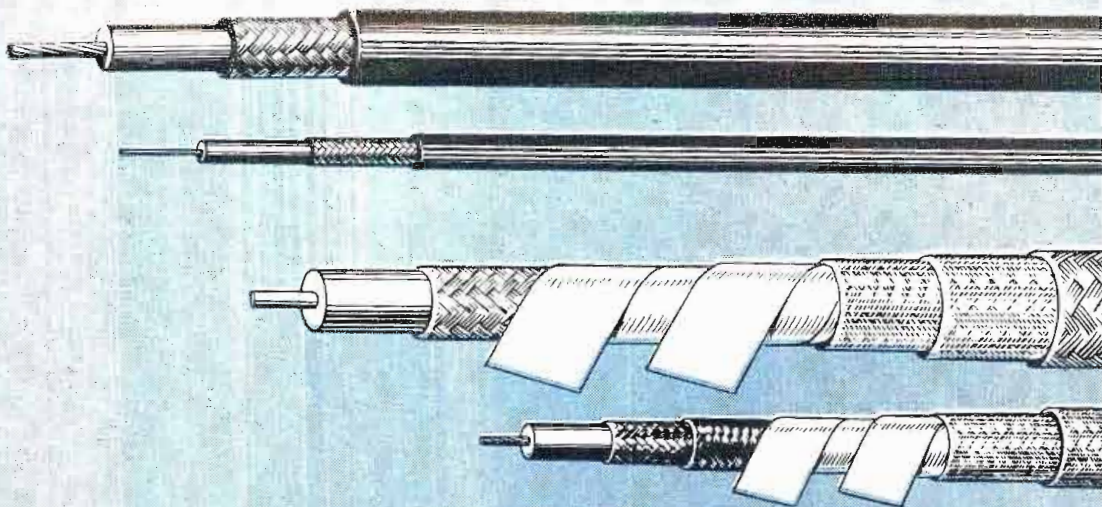
ers, as a coil cover, or for holding lead wires in place. Further, it is resistant to acids, alkalis, acetone, ketones, hydrocarbons, esters, and other common solvents. Tensile strength of the new tape is 35 lbs. per in. width and will stretch approx. 150% of its length before breaking. The new electrical tape #5 has an insulation resistance of 100,000 megohms, a dielectric strength of 5,500 v. and an electrolytic corrosion factor of 1. It is available in 72 yd rolls in widths of from 1/4 to 1 in. Wider dimensions are available on special order.—Minnesota Mining and Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.—TELE-TECH & ELECTRONIC INDUSTRIES

### Watersealed Jacks

The need for phono and microphone jacks which defy moisture has been met with perfection of watersealed jacks, types WS-1A and WS-A2B. Designed for communications systems where rapid electrical connections must be made by phone plugs under conditions of high humidity, tests have shown the Mallory watersealed jacks are capable of



withstanding a six-foot head of water for 24 hours. Type WS-1A is a phono jack with terminals for one circuit and ground. Type WS-A2B is a microphone jack with terminals for two circuits and ground. Dielectric strength is 500 v. RMS with contact resistance of .02 ohms max. Insertion force is approx. 6 lbs. Withdrawal force is 3 to 6 lb. on the WS-1A, 1 1/2 to 5 lbs. on the WS-A2B. The jacks are capable of 5000 insertion and withdrawal cycles without change in spring characteristics.—P. R. Mallory & Co., Inc., 3029 E. Washington St., Indianapolis 6, Ind.—TELE-TECH & ELECTRONIC INDUSTRIES



## precision-made components for ELECTRONICS

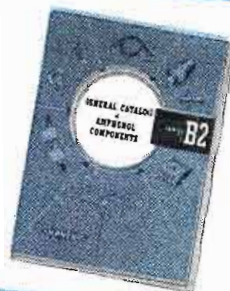
**RF CABLES** The expert engineering that went into the AMPHENOL RG Cables is reflected in their superior record of dependability and efficiency. Produced to rigid military specifications, strict end-to-end uniformity is just one feature of these remarkable cables. Utilization of polyethylene for most cable dielectrics and Teflon for high temperature applications insures peak performance.

**RF CONNECTORS** AMPHENOL RF Connectors give never-failing continuity in the linking of coaxial cables. Available in several different types of construction, they have extremely low RF loss and a performance reputation of durability.

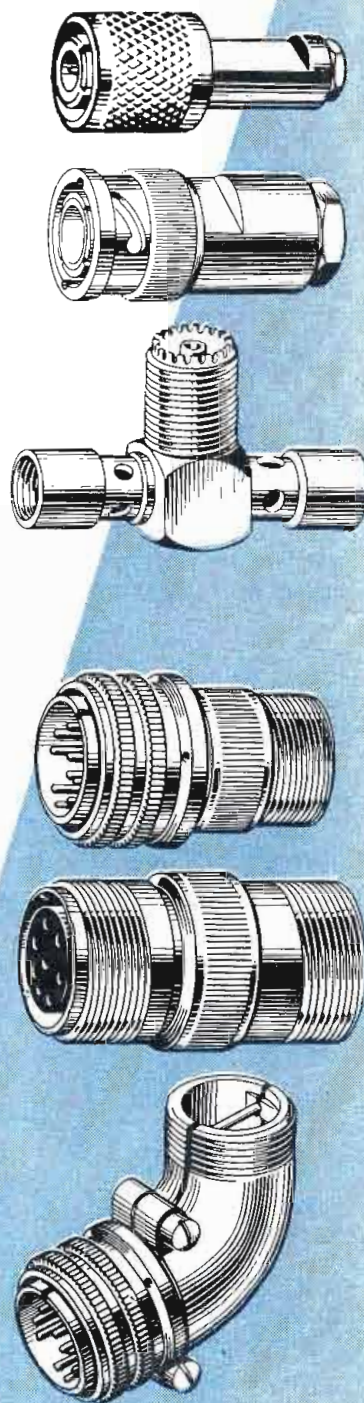
**AN CONNECTORS** AMPHENOL is the leading manufacturer of AN Connectors. For use in critical power, signal and control circuits, these connectors fully meet government specifications. (In fact, prior to the issuance of MIL-C-5015, AMPHENOL AN Connectors incorporated many features requested by the specifications.)

AMERICAN PHENOLIC CORPORATION  
chicago 50, illinois

**AMPHENOL**

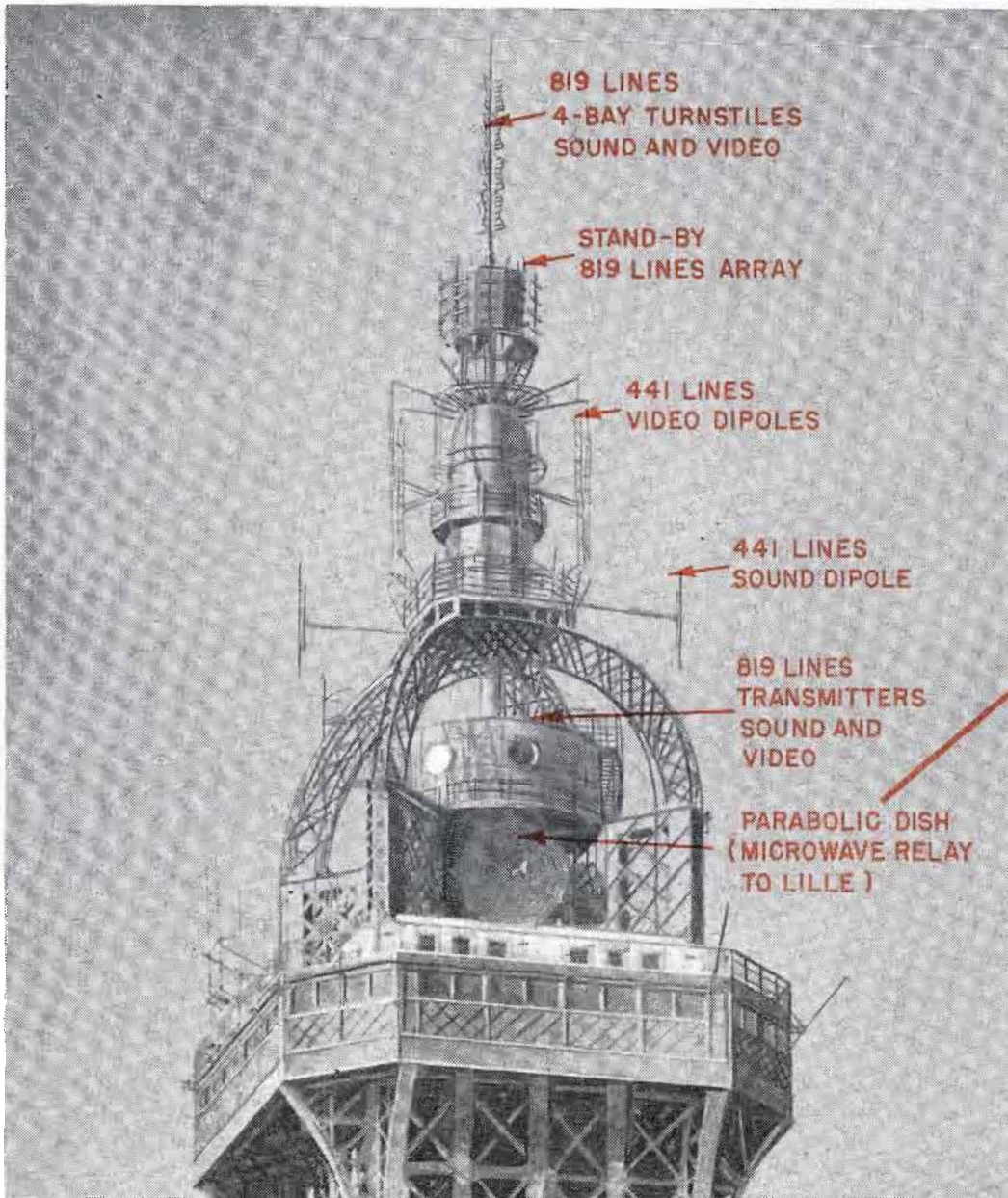


Send for your  
copy of General  
Catalog, B-2





# TV Covers Coronation



819 LINES  
4-BAY TURNSTILES  
SOUND AND VIDEO

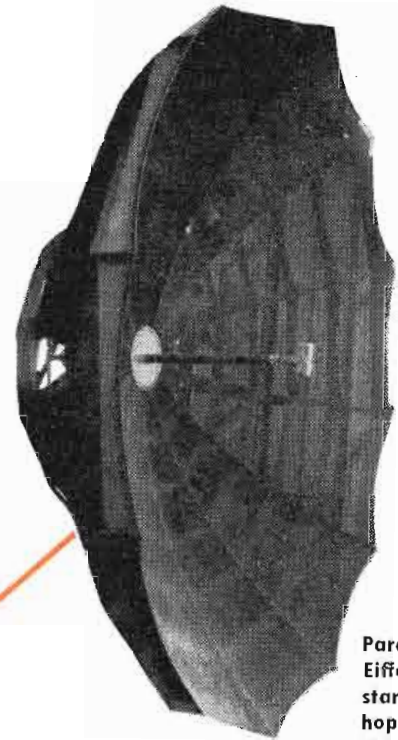
STAND-BY  
819 LINES ARRAY

441 LINES  
VIDEO DIPOLES

441 LINES  
SOUND DIPOLE

819 LINES  
TRANSMITTERS  
SOUND AND  
VIDEO

PARABOLIC DISH  
(MICROWAVE RELAY  
TO LILLE)



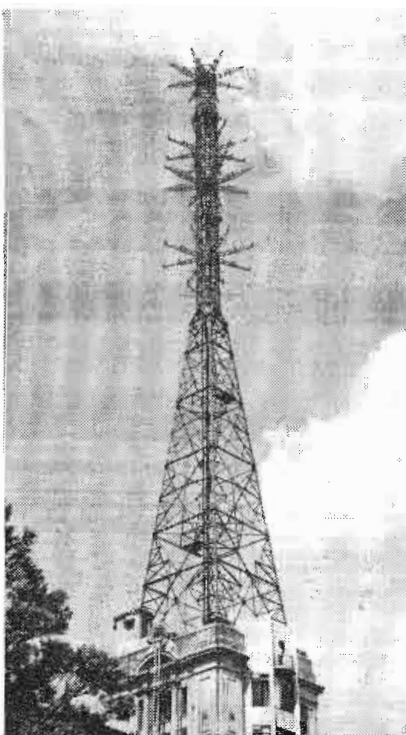
Parabolic dish on Eiffel Tower is start of three-hop microwave link from Paris to Lille

Microwave and TV transmitting equipment atop Paris' Eiffel Tower includes 4-bay turnstiles for 819-line system and dipoles for 441-line system. Tower built for 1889 exhibition is 984 ft. high

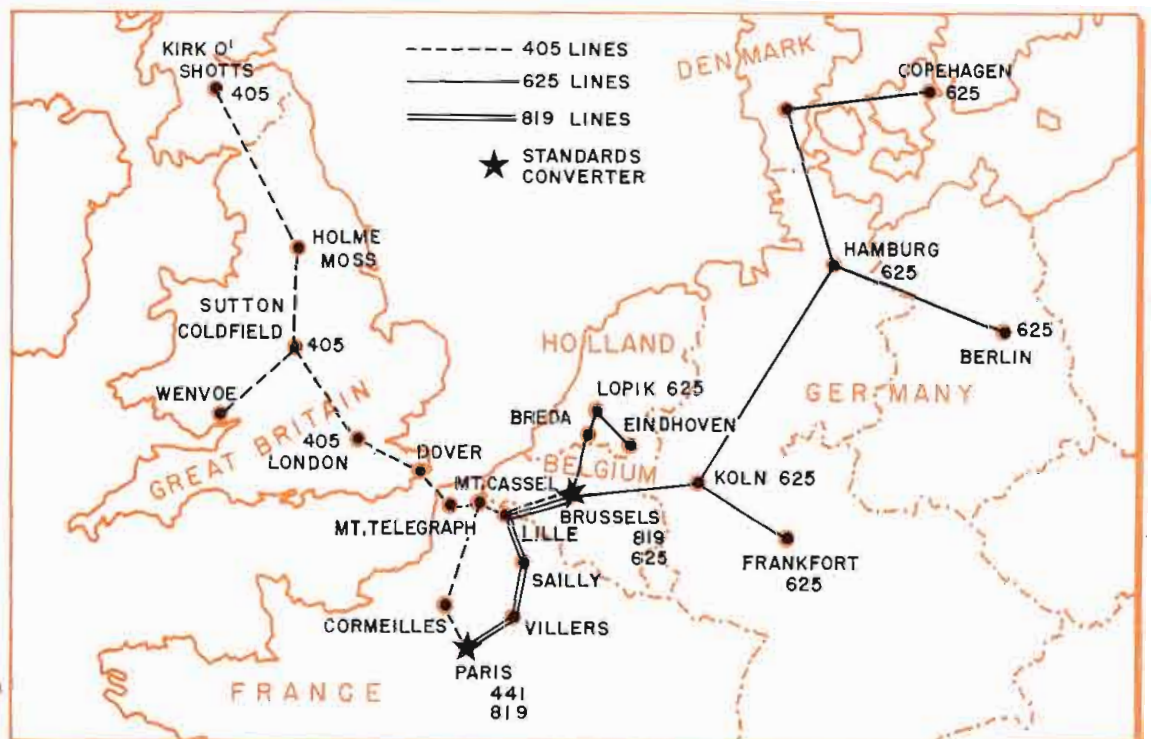
## GREAT BRITAIN

Three groups of cameras, situated near Buckingham Palace, Westminster Abbey, and Hyde Park, will provide a continuous coverage of the royal parade. One camera will be inside the Abbey, by special authorization, and will transmit the Coronation. The signal, on the

TV tower at Alexandra Palace, London



Microwave relay route carrying Coronation telecasts from Great Britain into countries on Continent



## As we go to press . . .

This exclusive report to TELE-TECH & ELECTRONIC INDUSTRIES has been prepared by A. V. J. Martin, editor of Television, Paris, France. In compact form, it describes the TV and microwave system being employed to carry telecasts of the June 2nd Coronation of Queen Elizabeth to Great Britain, France, Belgium, Holland, Germany, and Denmark. Information on U. S. preparations is given on page 90 of this issue.

British standard of 405 lines, will be relayed by the B.B.C. from London to Dover inclusive.

### FRANCE

From Dover, the signal will cross the Channel to Paris. Two transmitters are in use atop the Eiffel Tower. The old one is working on 441 lines, and is considered as obsolete, but will remain on duty till 1958. It will radiate directly the 405-line British signal, the standards being very similar but for the linage. This will eventually necessitate an adjustment of the line frequency of the 441-line receivers.

The new 819-line transmitter requires the conversion of standards. One of those will be in use in Paris. A relay links Paris to Lille in three hops. The Lille transmitter will thus radiate, over the northern part of France and southern part of Belgium, on the standard of 819 lines. The 405 lines signal arriving at Cassel will also be sent to Lille through a temporary relay, so that both 405- and 819-line signals will be at hand.

### BELGIUM

Belgium has a dual standard: 819 lines for the Walloons (French-speaking) and 625 lines for the Flemings (Dutch-speaking). This will entail a new standards converter in Brussels, to feed the 625-line transmitters.

### HOLLAND

A temporary relay will carry the 625 lines signal from Brussels to the Dutch experimental transmitter of Lopik. Holland will perhaps feed a second transmitter with the program.

### GERMANY

Another temporary relay will be used between Belgium and Germany to carry the 625-line signal. Germany will, on this occasion, inaugurate her eight-station microwave link between Köln and Hamburg. A temporary installation will carry the signal to the Langenberg and Frankfurt 625-line stations.

### DENMARK

It is quite possible that the 625-line signal arriving at Hamburg will still carry on to Denmark, but this has not been officially confirmed yet.

### THE SOUND

The ambient sounds, picked up in London, will be carried by cables, and will be used as a background for the local commentators.

# the *Waterman* SAR PULSESCOPE<sup>®</sup>



MODEL  
S-4-A

Size:  
9 1/8" x 11 1/4" x 17 1/4"  
31.5 Pounds

## ANOTHER EXAMPLE OF *Waterman* PIONEERING . . .

The SAR PULSESCOPE, model S-4-A, is the culmination of compactness, portability, and precision in a pulse measuring instrument for radar, TV and all electronic work. An optional delay of 0.55 microseconds assures entire observation of pulses. A pulse rise time of 0.035 microseconds is provided thru the video amplifier whose sensitivity is 0.5V p to p/inch. The response extends beyond 11 MC. A and S sweeps cover a continuous range from 1.2 to 12,000 microseconds. A directly calibrated dial permits R sweep delay readings of 3 to 10,000 microseconds in three ranges. In addition,

R sweeps are continuously variable from 2.4 to 24 microseconds; further expanding the oscilloscope's usefulness. Built-in crystal markers of 10 or 50 microseconds make its time measuring capabilities complete. The SAR PULSESCOPE can be supplied directly calibrated in yards for radar type measurements. Operation from 50 to 1000 c.p.s. at 115 volts widens the field application of the unit. Countless other outstanding features of the SAR PULSESCOPE round out its distinguished performance.

## WATERMAN PRODUCTS CO., INC.

PHILADELPHIA 25, PA.

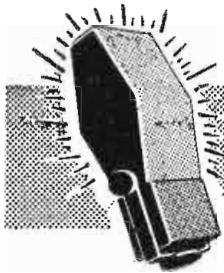
CABLE ADDRESS: POKETSCOPE

WATERMAN PRODUCTS INCLUDE

S-5-A LAB PULSESCOPE  
S-11-A INDUSTRIAL POKETSCOPE<sup>®</sup>  
S-12-B JANIZED RAKSCOPE<sup>®</sup>  
S-14-A HIGH GAIN POKETSCOPE  
S-14-B WIDE BAND POKETSCOPE  
S-15-A TWIN TUBE POKETSCOPE

Also RAYONIC<sup>®</sup> Cathode  
Ray Tubes and Other  
Associated Equipment





# TELE-TECH'S NEWSCAST

## Congress Investigates Color TV

In March of this year the House Interstate & Foreign Commerce Committee, Charles A. Wolverton (R.-N.J.), chairman, held a hearing in Washington to study the color TV situation. The hearing was held because it was alleged that some unnamed influence was holding back color. As is known, the FCC adopted color TV standards, the non-compatible, field sequential system proposed by CBS, three years ago, but there are no color receivers in our homes.

To the large number of TV engineers hard at work in several laboratories in different parts of the country on the research, development and field-testing of a compatible color system, it must have seemed strange that our lawmakers were moved to investigate at this time. At any rate, investigation served to accomplish some useful results.

*The Witnesses:* The witnesses for Industry that told the Committee, among other things, that a compatible system was a "must" were E. W. Engstrom for RCA; Richard Hodgson for Chromatic TV Labs.; A. B. DuMont for DuMont

Labs.; W. R. G. Baker for National Television System Committee (NTSC). Frank Stanton for CBS testified that it was useless to proceed with the CBS field-sequential system, the only one approved by FCC, without Industry support. Chairman Walker of the FCC was the final witness at the hearing.

Twenty million dollars have been spent in developing an all-electronic system for color. RCA is working with NTSC on standards which are now undergoing thorough field-test by NTSC members. At present RCA has two color-equipped studios in New York City and could begin color telecasting without delay. Tri-color picture tubes production has been laid out and color cameras for both studio and outdoor use have been built. In fact, RCA has just announced improved experimental models of both of these items. These units were demonstrated to the Wolverton Committee on April 14, 1953 at Princeton, N. J., using NTSC signals transmitted by WNBT from the Empire State Building 45 miles away. Of particular interest were several engineer-



Dr. Paul K. Weimer of RCA's David Sarnoff Research Center, Princeton, N. J., holds the new tri-color TV camera tube which will replace three tubes now needed in color TV cameras

## Du Mont Opens CRT Instrument Plant

One of the world's largest plants devoted exclusively to the manufacture of cathode-ray tube instruments for industrial and defense use has been opened by Allen B. Du Mont Labs., Inc., at 750 Bloomfield Ave. Construction of the new plant was begun in August 1952, and regular production of various oscillograph types has been under way since early April, 1953. The plant is 525 feet long, 228 feet wide, and has total area of 118,000 sq. ft. 77,000 sq. ft. are used for production and office space. Remaining 41,000 square feet allows for

future expansion. Approximately 400 people are employed in the new Instrument Div. plant.

Total plant area including plant, adjoining roads and parking space, is 315,000 sq. ft. Total manufacturing area including inspection and finished test is approximately 17,000 sq. ft. Engineering area is approximately 15,000 sq. ft.

Manager of the Instrument Division is Rudolph Feldt. Other Du Mont manufacturing plants are at: East Paterson, N. J., TV receiver assembly; Clifton, N. J., transmitter and broadcast TV equipment; Passaic, N. J., research, Clifton, N. J., cathode-ray tube production.



Manufacturing area of Du Mont Instrument Div. plant devoted exclusively to CRT instrument production

ing advances noted in this successful demonstration: A single-tube color camera operating on photo-conductive principles similar to the Videcon; a bright picture tube, employing a focus mask instead of a shadow mask, reaching 60 ft. lamberts; and an 18 x 24 in. color projection system.

Steps suggested by RCA at the March hearing were: Complete field tests of NTSC standards; secure FCC approval of standards without delays of a formal hearing; broadcast both non-compatible and compatible signals and let the public decide which should survive (not necessary now since the CBS system is no longer in the running). In answer to the question, "How soon will we have color?" Dr. Engstrom said that NBC could begin broadcasting "tomorrow" and that the manufacture of tri-color tubes and sets could be expedited.

To this same question of "How soon?" Dr. Stanton of CBS thought that if FCC could approve the new system in 6-18 months, then industry should be tooled up shortly thereafter. Dr. DuMont, who recalled that it had taken FCC several years to act on the TV problems of the past, gave his estimate as 5 years. This was arrived at by allowing: Time to present standards to FCC, 1 year; FCC approval, 3 years; time to tool up, 1 year. Dr. Baker testified that he thought Dr. Stanton's estimate was reasonable.

*Position of NTSC:* This technical advisory group was set up at the request of FCC when Fly was chairman, to formulate monochrome standards for FCC approval. After the FCC color hearing, the NTSC was revived and for the last two years it has been working on standards for a compatible color system. Field tests last Fall indicated the need for some modification in tentative standards. These have now been made and comprehensive tests now in progress should be completed by about September. Dr. Baker recommended:

(1) That the Commissioners recognize and support the NTSC. This was done as a result of this hearing. FCC engineers have been asked to attend field tests. (2) That FCC ease restrictions to permit more broadcasting of experimental color TV tests of NTSC signals. This is being done. (3) That NTSC be allowed to complete present field tests. (4) That upon completion of the tests FCC consider and adopt new color standards in a manner similar to that employed for monochrome standards in 1940-41.

*Conclusions:* Our own conclusions are: (1) We should have commercial color TV in from 1½ to 5 years. This includes tooling time and the slow start of receiver sales for what will be a deluxe service. (2) NTSC will complete tests within 5 months. Within 6 months, RCA or some other manufacturer will petition FCC to approve new color standards. It is possible that FCC may request that the proposed signal be put on the air, probably in Washington, so the Commissioners or their staff may make tests. (3) The formal hearing and FCC decision should take about 5 months (a guess). Thereafter limited hours of telecasting will be available for a small but growing audience who can afford deluxe TV, costing at least 50% more than monochrome.

*Advantages Accruing from this Hearing:* These are: (a) Agreement that the non-compatible color system has now been discarded; (b) FCC's recognition of NTSC and the promise of speedy action on standards; (c) The alerting of Industry of the approach of color, and (d) the reassurance to the prospective purchasers of TV receivers that the monochrome sets they buy now will continue to receive standard quality images in black-and-white, when, in the years to come, color TV is on the air.

### **Silicon for Transistors**

E. I. du Pont de Nemours & Co., Wilmington, Del., has announced the development of a process for manufacturing pure silicon for transistors. The non-metallic material is reported to allow a wider temperature range of operation than germanium. Estimated cost is \$430/lb., with an individual wafer costing between 2 and 4 cents.

### **New System for 3-D Sound-on-Film**

Twentieth Century-Fox has announced a new magnetic sound-on-film system, developed by E. I. Sponable, director of research for the company. It will be used with wide-screen CinemaScope (see May 1943 TELE-TECH & ELECTRONIC INDUSTRIES, page 66), and requires few changes in standard projection equipment. Sprocket holes have been narrowed to allow two magnetic sound tracks to be placed on each side of the film. The new sound head required is being produced by RCA, General Precision Labs., Altec, and Westrex.

# WDAF-TV

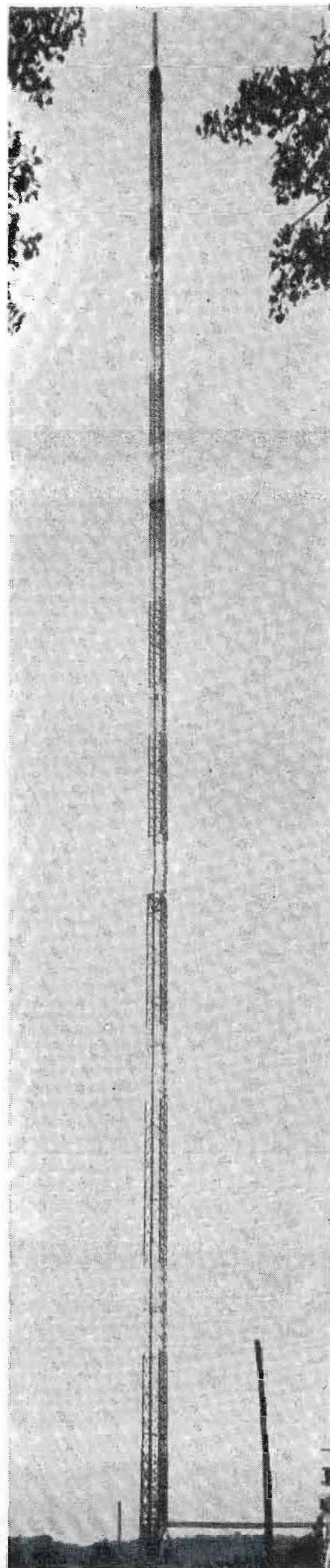
One of the  
nation's great  
television stations

SELECTS A  
LEHIGH TOWER

WDAF-TV, the Kansas City Star station, chooses the Lehigh pictured here. This 650 foot galvanized guyed tower uses an RCA TF 5A antenna mounted atop.

If you are planning a new facility or changing power in your present station, look to Lehigh for the best in tower construction.

LEHIGH's leadership in the tower business is known nationwide. For dependable, durable towers, consult LEHIGH.

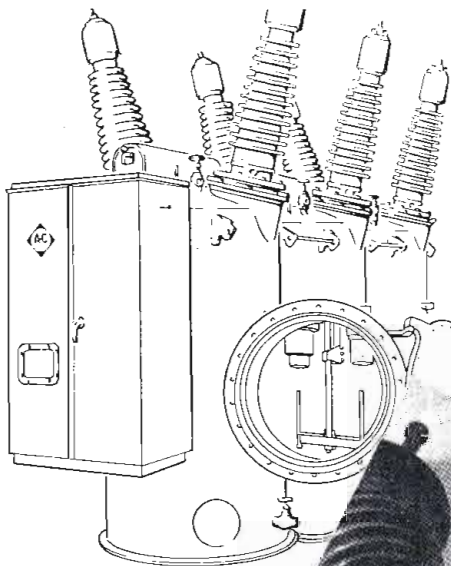


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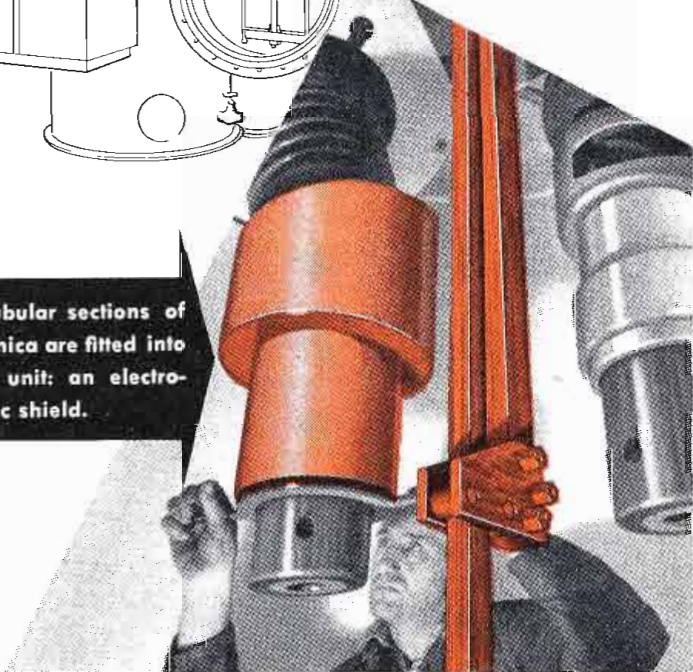
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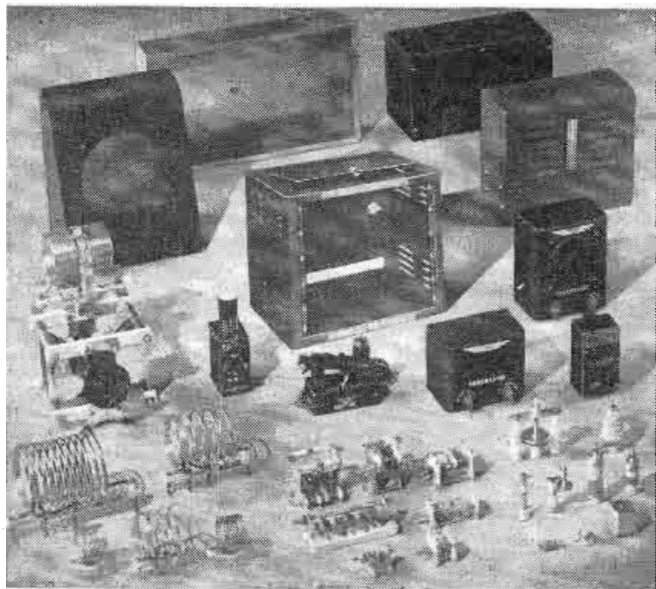
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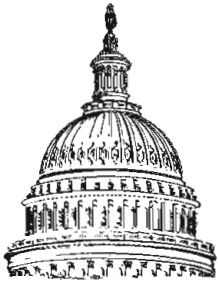
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# WASHINGTON

## *News Letter*

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Latest Radio and Communications News Developments Summarized by TELE-TECH's Washington Bureau

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**FEES PLAN FOR FCC**—A subject of consideration by Congressional appropriations committees for the past several years—the charging of fees for the filing of applications for broadcasting-television-mobile radio station construction permits and licenses by the FCC—has definitely come to the forefront in the economy-minded Eisenhower administration. The FCC has been directed by the Bureau of the Budget to submit its plan for the charging of fees and since the initiative has now come from that important arm of the Eisenhower administration the establishment of the fees-charging system by the FCC is more of a possibility than ever before. The plan could well be modeled after the fees' system used by the Patent Office and by the Federal Courts. The scale of charges would undoubtedly be graduated according to classes of radio services by the FCC and it is estimated the plan would produce approximately \$1,000,000 a year from all FCC sources.

**SPEED UP TV GRANTS**—That Congress has a paramount interest in the expansion of television throughout the nation was exemplified in the emphasis on giving the FCC additional funds—contrary to the trend for economy in governmental appropriations—by the Senate Appropriations Committee to establish a total of two score of “examiner” teams to handle the huge load of approximately 600 unprocessed competitive station applications. Demonstrating the interest of Senators in the growth of television, the Senate Interstate Commerce Committee summoned the entire seven FCC Commissioners before it May 8 to consider methods of expediting television station authorizations, particularly in areas without any video service.

**CLEANING HOUSE**—Reorganization of the FCC staff with the replacement of a number of key staff officials took place last month and even with a reduction in the staff posts the Commission is expected to function more efficiently. New appointments were to come in the FCC Broadcast, Common Carrier and Safety & Special Radio Services Bureaus' chieftainships and several top echelon staff positions. In addition, there was slated a sweeping change of the incumbents in the key posts in the FCC Legal Department, while new appointments were upcoming for the FCC Secretaryship and in several top administrative positions. The revamping of the top personnel in the Broadcast Bureau which handles television as well as AM-FM broadcasting and in the Legal Department will in itself aid in the establishment of more expeditious processing of TV station authorizations.

**COMMUNICATIONS ACT**—The House Interstate & Foreign Commerce Committee favorably reported out three bills affecting the FCC's operations. One bill, if passed by Congress, would be the first amendment to the McFarland Act, which altered the Communications Act last year. It would extend the time within which the Commission must act, on a protest of any radio authorization issued by the FCC without hearing, from 15 days, as now provided, to 30 days. Chairman Hyde had reported that 15 days does not allow enough time to consider filings in opposition to the protests. The other bills reported out by the House Committee would abolish the present requirement for the issuance of construction permits for all mobile radio stations, and would permit the FCC to waive CP requirements in the other non-broadcast services. Also, it would strengthen the criminal sanctions of the Communications Act by changing the offense classification from a felony to a misdemeanor for first offenses, making for more likely prosecution and conviction for general violations.

**MOBILE RADIO BACKLOG**—While the expansion of television attracts by far the greatest public attention, the FCC Safety & Special Radio Services Bureau's functioning with an adequate staff is considered to be equally important. The House Appropriations Committee gave the FCC an increase of \$240,000 over the funds allocated for its current fiscal year. This was due to the fact that the mobile and microwave radio services are regarded as vital to many phases of the nation's businesses and industries. If Congress does not recognize the need for additional funds for this phase of the FCC's activities, the backlog of unprocessed mobile radio applications may grow into such proportions as to create just as serious backlogs of undisposed applications as exist in the television field.

**NEW COMMISSIONER**—Even though his previous career has been in regulation of utilities, including telephone companies, the new FCC Commissioner John C. Doerfer who came to the FCC from the Wisconsin Public Service Commission chairmanship has been most alert in assimilating the facts about broadcasting and television as well as the entire functioning of the Commission. An able lawyer and an energetic person, Commissioner Doerfer has already gained recognition as one of the leading members of the FCC from outside observers and the industries under that Commission's jurisdiction.

*National Press Building  
Washington, D. C.*

*ROLAND C. DAVIES  
Washington, Editor*



# SILVER GRAPHALLOY BRUSHES

Silver GRAPHALLOY Brushes have been widely used because of low and constant contact drop, extremely low electrical noise and long life . . . especially for rotating strain gages, thermocouple circuits, synchros, guided missiles, fire control equipment, transducers, radar and sonar equipment, servo-mechanisms, selsyns and dynamotors.\*

The GRAPHALLOY process was patented 40 years ago and the name GRAPHALLOY has been our copyrighted trademark since that time. While this company has been selling GRAPHALLOY for the past 40 years recent developments have added materially to its properties. Over 30 grades are now used in a wide variety of applications. Silver GRAPHALLOY Brushes on 1/2"-diameter coin silver slip rings have been used successfully in highly critical electrical circuits at speeds up to 100,000 R.P.M. Our Engineering Department will assist in determining the exact grade of GRAPHALLOY for your needs.

## BRUSH AND SPRING ASSEMBLY.

Silver GRAPHALLOY Brushes are available for the standard Brush Holders described in the next column. Springs are supplied, as part of the assembly, to give the correct brush pressure for each brush application. Shunts are provided where necessary to insure extremely low electrical noise level and for carrying heavy currents.



## COIN SILVER SLIP RINGS

Standard Coin Silver Slip Rings, both cylindrical and flat types, are illustrated below. We recommend the cylindrical type ring with three brushes per ring . . . spaced at 120°. The cylindrical type are designed for press fitting over standard steel shafting. The flat type rings are designed for nesting either on an insulated plate or for molding into insulation. Insulated slip rings of either type or slip ring assemblies can be furnished with leads attached.



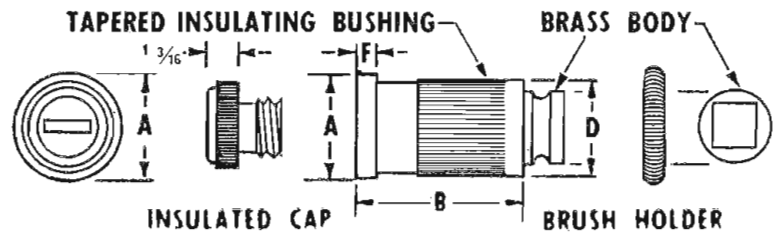
Standard "Flat" rings have 1/4" radial contact surface and 1/8" radial spacing between adjacent rings.

Part No.	OD	ID	Thickness
168-20	1 1/4	3/4	3/16
168-32	2	1 1/2	3/16
168-44	2 3/4	2 1/4	3/16
168-56	3 1/2	3	3/16
168-68	4 1/4	3 3/4	3/16
168-80	5	4 1/2	3/16
168-92	5 3/4	5 1/4	3/16
168-104	6 1/2	6	3/16
168-116	7 1/4	6 3/4	3/16
168-128	8	7 1/2	3/16
168-140	8 3/4	8 1/4	3/16
168-152	9 1/2	9	3/16
168-164	10 1/4	9 3/4	3/16
168-176	11	10 1/2	1/4
168-188	11 3/4	11 1/4	1/4
168-200	12 1/2	12	1/4
168-212	13 1/4	12 3/4	1/4
168-224	14	13 1/2	1/4
168-236	14 3/4	14 1/4	1/4
168-248	15 1/2	15	1/4
168-250	16 1/4	15 3/4	5/16
168-262	17	16 1/2	5/16
168-274	17 3/4	17 1/4	5/16
168-286	18 1/2	18	5/16
168-298	19 1/4	18 3/4	5/16
168-300	20	19 1/2	5/16

Part No.	OD	ID	Width
116-4**	1/4	.127/.123	3/16
116-6**	3/8	.252/.248	3/16
116-8**	1/2	.377/.373	3/16
116-10**	5/8	.502/.498	3/16
116-12**	3/4	.627/.623	3/16
116-14**	7/8	.752/.748	1/4
116-16**	1	.877/.873	1/4
116-18**	1 1/8	1.002/.998	1/4
116-19	1 3/16	1.000/.996	1/4
116-23	1 7/16	1.250/1.246	1/4
116-27	1 11/16	1.500/1.496	1/4
116-35	2 3/16	2.000/1.996	1/4
116-43	2 11/16	2.500/2.496	1/4
116-52	3 1/4	3.000/2.996	5/16
116-60	3 3/4	3.500/3.496	5/16
116-68	4 1/4	4.000/3.996	5/16
116-76	4 3/4	4.500/4.496	5/16
116-84	5 1/4	5.000/4.996	5/16
116-92	5 3/4	5.500/5.496	5/16
116-102	6 3/8	6.000/5.996	5/16
116-118	7 3/8	7.000/6.996	5/16
116-134	8 3/8	8.000/7.996	5/16
116-150	9 3/8	9.000/8.996	5/16
116-166	10 3/8	10.000/9.996	5/16

\*\*Coin silver .025 thick inlaid over brass.

## BRUSH HOLDER AND CAP



Brush Holder and Cap No.	Brush Size	Suggested Slip Ring Width	Distance Brush Holder to Slip Ring	*Mounting Hole Diameter	A. Shoulder Dia.	B. Overall Length without Cap	D. Bushing Maximum Dia.	F. Flange Thickness
14326	1/8 sq.	3/16	1/16	13/32	.430	7/8	.425	3/32
11509	5/32 sq.	3/16	1/16	13/32	.430	7/8	.425	3/32
11570	3/16 sq.	1/4	1/16	7/16	.469	7/8	.450	3/32
11527	1/4 sq.	3/16	1/8	7/16	.616	1 3/16	.578	1/8

Other sizes available.

\*Mounting hole diameter for Brush Holder dimension D.

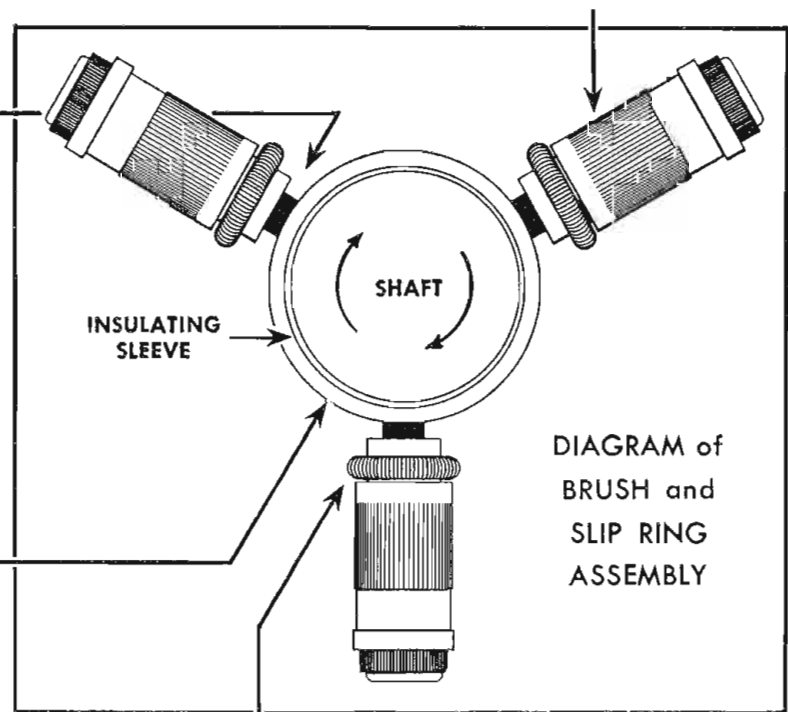


DIAGRAM of BRUSH and SLIP RING ASSEMBLY



## CONNECTORS (GARTER SPRINGS)

These silver plated coil spring Connectors make for positive electrical connection to the brass body of the brush holder by snapping into the groove in the holder. The connecting lead can be pre-soldered to the Connector.

Garter Spring Connectors	Brush Size	Brush Holder No.
127-9	1/8 sq.	14326
127-9	5/32 sq.	11509
127-10	3/16 sq.	11570
127-14	1/4 sq.	11527

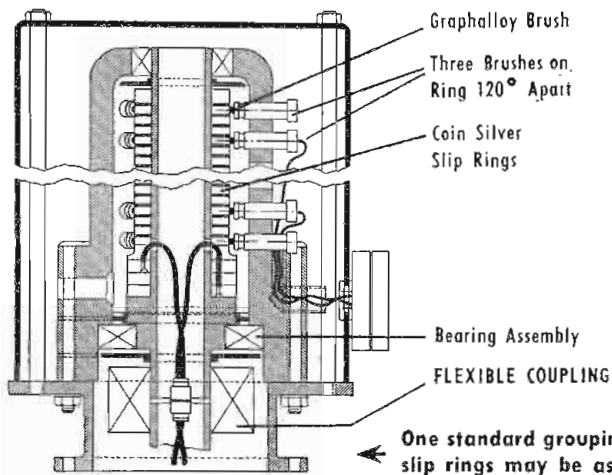
\*CALL ON OUR 40 YEARS OF DESIGN EXPERIENCE FOR HELP IN SOLVING YOUR BRUSH PROBLEMS!



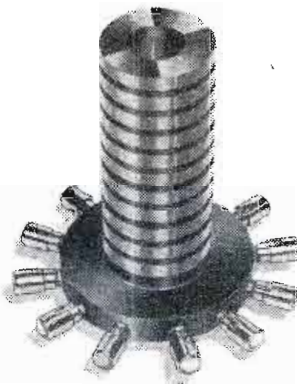
# ... and SILVER GRAPHALLOY brush assemblies

for your "TOUGH"  
electrical  
requirements

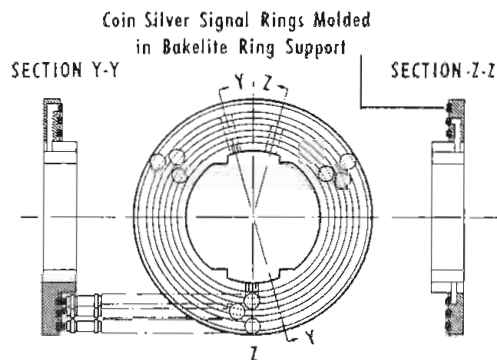
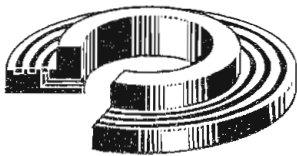
## CYLINDRICAL SLIP RING and BRUSH HOLDER ASSEMBLY



## CYLINDRICAL SLIP RING ASSEMBLY



## FLAT SLIP RING ASSEMBLY



On rotating equipment, the measurement of changes in resistivity or emf must be brought out by means of slip rings and brushes. To obtain intelligible information under these conditions, the extraneous circuit noise level must be kept below the signal level. Since Silver GRAPHALLOY Brushes, in combination with Coin Silver Slip Rings, reduce the extraneous noise level to extremely low values, they have

been used extensively in rotating strain gage and thermocouple applications. Noise levels as low as 20-50 microhms in a 100-ohm circuit have been obtained with Silver GRAPHALLOY Brushes. (*We will develop and manufacture your complete assembly!*) Commutators and choppers for the production of square wave signals or for pulse systems can be manufactured to meet your circuit requirements.

### GRAPHALLOY CONTACTS

GRAPHALLOY, because of its inherent non-welding and arc-quenching characteristics, is used widely for contacts . . . especially where positive breaking of a circuit is required.



### GRAPHALLOY BUSHINGS

With military requirements demanding operation from  $-80^{\circ}$  to  $+200^{\circ}$  F., GRAPHALLOY Bushings, which are inherently oilless, have been used successfully in potentiometers, synchros, cameras, and missiles. Properly designed GRAPHALLOY Bushings will take considerable shock (50 g.). They have replaced oil-lubricated bushings for the following reasons:

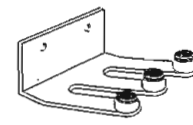
- 1) Lower friction at room temperatures.
- 2) No oil to solidify at low temperatures.
- 3) No oil to carbonize at prolonged elevated temperatures.

## GRAPHALLOY BRUSHES

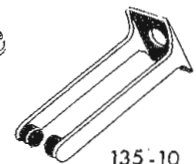
are used on  
such equipment as . . .

- SERVO SYSTEMS
- SYNCHROS
- SELSYNS
- CHOPPERS
- RADAR
- GYROS
- INVERTERS
- PULSE SYSTEMS
- GUIDED MISSILES
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- WAVE GUIDES
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- TORQUE INDICATORS

"We Specialize in  
Special Designs"

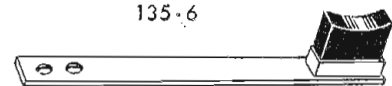


135-18



135-10

135-6

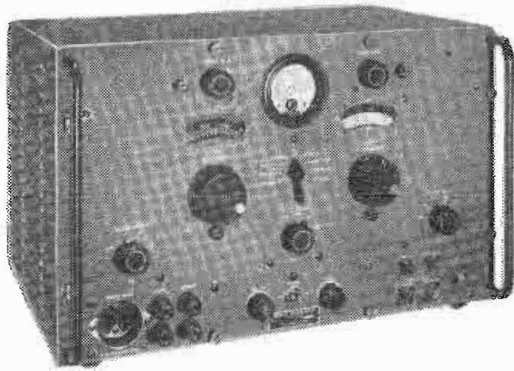


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## the Type H-12 **UHF** **SIGNAL** **GENERATOR** 900-2100 Megacycles

This compact, self-contained unit, weighing only 43 lbs., provides an accurate source of CW or pulse amplitude-modulated RF. A well-established design, the Type 12 has been in production since 1948. The power level is 0 to -120 dbm, continuously adjustable by a directly calibrated control accurate to  $\pm 2$  dbm. The frequency range is controlled by a single dial directly calibrated to  $\pm 1\%$ . Pulse modulation is provided by a self-contained pulse generator with controls for width, delay, and rate; or by synchronization with an external sine wave or pulse generator; or by direct amplification of externally supplied pulses.

Gold Plating of the oscillator cavity and tuning plunger assures smooth action and reliable performance over long periods. Generous use of silicone-treated ceramic insulation, including resistor and capacitor terminal boards, and the use of sealed capacitors, transformers, and chokes, insures operation under conditions of high humidity for long periods.

Built to Navy specifications for research and production testing, the unit is equal to military TS-419/U. It is in production and available for delivery.

Price: \$1,950 net, f.o.b. Boonton, N. J.

### Type H-14 Signal Generator

(108 to 132 megacycles) for testing OMNI receivers on bench or ramp. Checks on: 24 OMNI courses, left-center-right on 90/150 cps localizer, left-center-right on phase localizer, Omni course sensitivity, operation of TO-FROM meter, operation of flag alarms.

Price: \$942.00 net, f.o.b. Boonton, N. J.

WRITE TODAY for descriptive literature on A.R.C. Signal Generators or airborne LF and VHF communication and navigation equipments, CAA Type Certificated for transport or private use. Dept. 7



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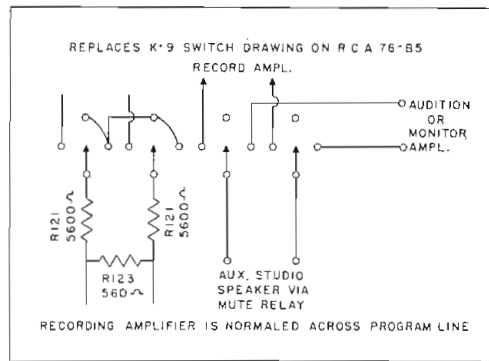
**Aircraft Radio Corporation**  
Boonton, New Jersey

## CUES for BROADCASTERS

(Continued from page 121)

ords in the control room, talking back to other studios etc., and at the same time maintaining the program to the auxiliary speakers.

To overcome this, disconnect wiring from the recording half of switch K-9 on the 76-B5 and rewire



Modification of RCA 76-85 console provides audition monitor circuits for small stations.

according to the diagram. The recording amplifier is normalled across the program line so by use of the switch the auxiliary speakers may be fed from the monitor amplifier or so simply switched to the recording amplifier.

### Remote Indicator Tells Tower Light Condition

PHILLIP R. HURLBUT, Eng. Director, WCSI, Columbus, Ind.

USUALLY the biggest problem in the average station is to obtain a simple trouble free system for accurately showing the condition of the lights on the tower. Here at WCSI, our 334 foot tower and large top plate make it impossible to see the beacon without walking or driving out to the highway, which is quite some distance, and consequently leaves the station un-manned. The system provides immediate knowledge to the engineer of any single light failure, and then less noticeable indications as additional lights burn out. It requires only 2 light sockets,

2 special types of bulbs interconnected to the tower lighting circuit.

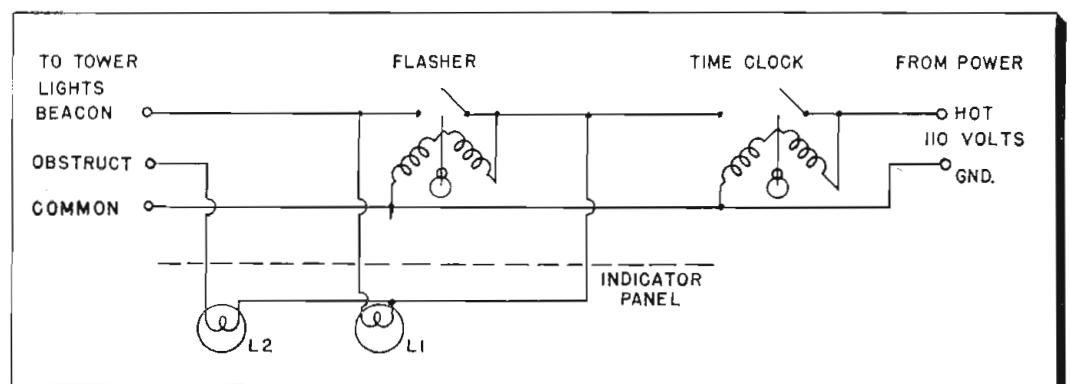
At WCSI, the flasher is in the building. Therefore it is quite simple to use this system. One bulb is a regular 7½ watt with standard light bulb base as used in the home, is installed across the beacon's flasher switch, so when the lights are out, in the beacon, the indicator is in series with the 2 - 500 watt beacon lights and glows to almost full brilliance. It of course flashes on and off with the flashing device.

The other bulb with a standard house type lamp base, is not so readily available, being used mostly in special dc lighting, low voltage applications. This bulb is placed in series with the 4 obstruction lights and glows to almost full brilliance when all the obstruction lamps are burning and drops to about one-third brilliance when any one obstruction lamp burns out.

There are other devices, usually employing meters or other similar indicators, but when these lamps are placed conspicuously on the wall, it is never necessary to be reading a meter or actually observing the indicator, as it becomes immediately obvious by the lack of the usually brilliant light the moment a lamp fails on the tower, or towers.

If the flasher(s) is located at the tower(s), it is always possible to bring back a sampling lead or two to feed the indicating lamps for each tower. Shown below is a sketch of a single tower installation as employed at WCSI. Lamp L-1 across the flasher switch is a small round 7½ watt, 110 volt bulb, which glows when the beacon lamps are off and shows continuity of the beacon lamp circuit to be complete. Lamp L-2 in series with the obstruction lamps is a 25 watt - 6 volt house type lamp used in dc lighting system, and glows all the time the obstruction lamps are lighted. This bulb does not noticeably reduce the brilliance of the obstruction lamps.

Flasher system for single tower installation





## BALANCED PERFORMANCE

gives you highest overall sound recording quality  
**...at no extra cost**

**audiotape** has been designed, formulated and perfected to meet the most exacting requirements for modern, professional sound recording. Its mechanical and magnetic properties are carefully balanced to assure optimum overall performance in *your* recording machines.

Output, frequency response, noise level and distortion are correctly proportioned for the most satisfactory end result—with no compromise on quality anywhere along the line.

Perfected manufacturing techniques and high production volume enable this premium-quality tape to be offered to you at *no increase in price*.

Here are some of Audiotape's extra-value features:

**More Uniform Frequency Response**—Audiotape's output does not tend to fall off at the higher frequencies. Response remains excellent throughout the complete range of audible sound, requiring no special equalization.

**Low Noise Level**—Extremely uniform dispersion of magnetic particles results in exceptionally low noise level—completely free from troublesome ticks and pops. Overall signal-to-noise ratio is entirely comparable to that obtainable with average production of any premium price tape on the market.

**Low Distortion**—Highest quality magnetic oxide, in a coating of precisely controlled uniform thickness, results in exceptionally low distortion over a wide range of bias settings.

**Maximum Uniformity**—All 7" and 10" reels of plastic base Audiotape are guaranteed to have an output uniformity within the reel of  $\pm \frac{1}{4}$  db or better—and a reel-to-reel variation of less than  $\pm \frac{1}{2}$  db. What's more, there's an actual output curve in every 5-reel package to prove it.

**Complete Interchangeability**—Since Audiotape requires no special equalization adjustments, Audiotape recordings can be interchanged freely between radio stations and studios—played back perfectly on any machine.

**Highest Coating Adhesion**—keeps the magnetic oxide coating from rubbing or flaking off. No danger of fouling heads and guides.

**Guaranteed Splice-Free**—Plastic base Audiotape, in both 1200 and 2500 ft reels, is positively guaranteed to be free from splices.

**Low-Tension Reel Design**—with  $2\frac{3}{4}$ " hub now standard for all 1200 foot, 7" reels. By eliminating the high tension zone encountered at smaller hub diameters, this reel assures more accurate timing, more constant pitch, slower maximum reel speeds and reduced wear on heads and tape.

**COMPARE AUDIOTAPE** in an end-to-end run with any other sound recording tape available. Compare the *prices*, too. You'll find that Audiotape speaks for itself—in *performance* and in *cost*!

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**audiopoints**  
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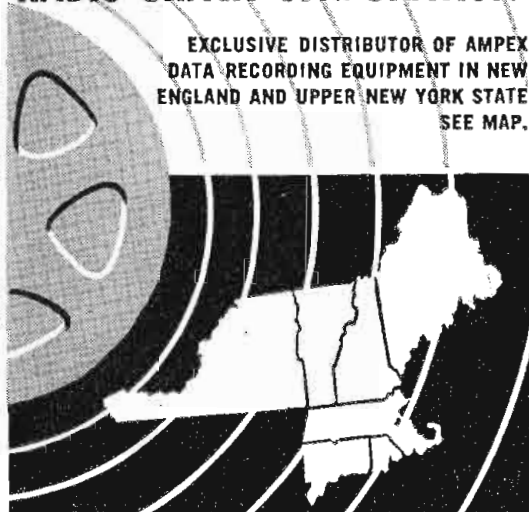
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# 350

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## World-wide Roundup of TV Statistics

Country	Lines	Frames	Channel width (mc)	TV Stations†			TV Receivers	
Albania	625	25	8					
Argentina	625	25	6	1T	1C	4P	15,000 est.	
Australia	625	25	7.5			2P		
Belgium* (French Dis.)	819	25	14	1T		4P	4,500 est.	
Belgium* (Flemish Dis.)	625	25	7	1T		4P		
Bolivia	525	30	6					
Brazil	525	30	6	4T	3C	9P	60,000 est.	
Bulgaria	625	25	8					
Canada	525	30	6	2T	1C	4P	250,000 est.	
Chile	525	30	6			2P		
Colombia	525	30	6			1P		
Cuba	525	30	6	8T	20C		120,000 est.	
Czechoslovakia	625	25	8				1X	
Denmark	625	25	7			1P	1,000 est.	
Dominican Republic	525	30	6	1T			500 est.	
Finland	625	25	7					
France*#	819	25	14	3T	4C	30P	70,000 est.	
Germany (East)	625	25	Vary	1T				
Germany (West)	625	25	7	7T	5C	10P	5,000 est.	
Great Britain*	405	25	5	5T	2C	3P	2,300,000 est.	
Guatemala	525	30	6			3P		
Haiti	525	30	6			1P		
Hungary	625	25	8					
Italy	625	25	7	2T	2C	5P	5,500 est.	
Japan	525	30	6			9P	2X	
Luxembourg	625	25	7					
Mexico	525	30	6	6T	3C	9P	50,000 est.	
Monaco*	819	25	14			2P		
Morocco*	819	25	14		1C	2P		
Netherlands	625	25	7	1T	2C	2P	1X	
Norway	625	25	7					
Poland	625	25	8					
Rumania	625	25	8					
Saar	{ 625 819	{ 25 25	{ 7 14			1P	1X	
Spain	625	25	7		2C		2X	
Sweden	625	25	7			4P	2X	
Switzerland	625	25	7		1C		2X	
Thailand							1X	
Tunisia*	819	25	14					
Turkey*	625	25	7			4P	1X	
Uruguay						3P		
USSR	625	25	8	4T			160,000 est.	
United States	525	30	6	167T	349C	627P	23X	
Vatican City	819	25	14			1C		
Venezuela	625	25	6	1T	2C	2P		
Yugoslavia	625	25	7	1T		2P		
<b>TOTAL</b>				<b>216T</b>	<b>399C</b>	<b>750P</b>	<b>37X</b>	<b>26,793,000 est.</b>

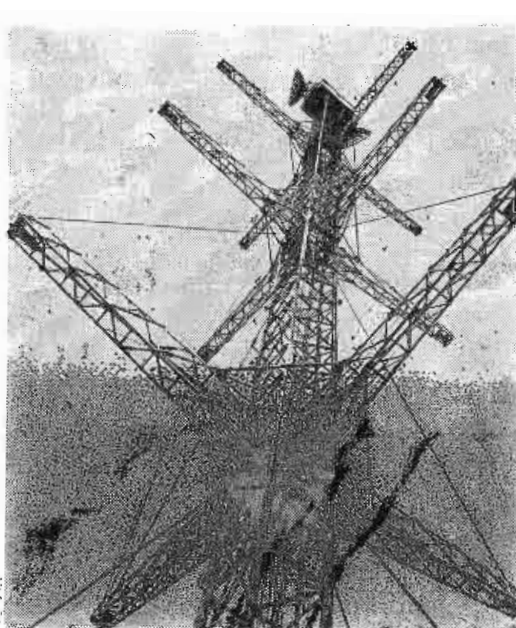
\*Use AM sound channel. All others use FM.

#One Paris transmitter will continue to broadcast on 441-line 9-MC standard until 1958.

†T denotes stations in operation; C under construction; P definitely planned; X experimental.

NOTE: Receiver estimates include official and non-official figures as of May 1953. USSR estimate includes 80,000 officially recorded in Moscow. Soviet trend toward wired TV is reported.

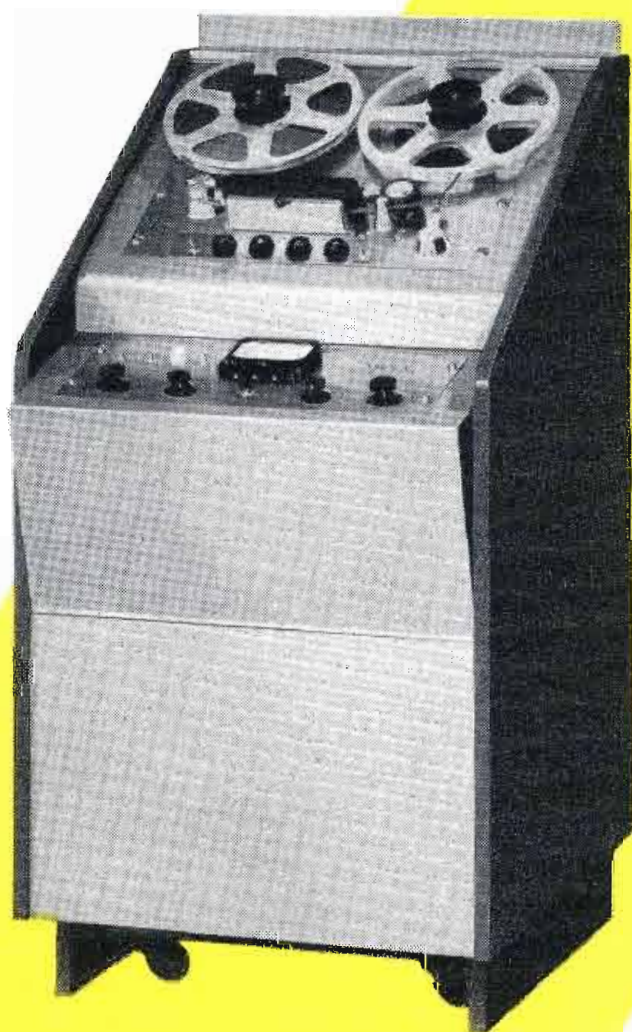
### TV TRANSMITTING TOWERS in GREAT BRITAIN and FRANCE



Microwave (l) at Sailly-Saillisel, France, relays 819-line TV signals between Paris and Lille. At Sutton-Coldfield, England, 750-ft. BBC tower (r) with two 4-dipole tiers radiate TV signals

# ANNOUNCING

## THE AMPEX 350 TAPE RECORDER



### AMPEX MODEL 350

Tape speeds — 7 1/2 & 15 in/sec. or 3 3/4 & 7 1/2 in/sec.

#### Frequency response

15 in/sec. — ± 2 db from 30 to 15,000 cycles

7 1/2 in/sec. — ± 2 db from 30 to 10,000 cycles  
± 4 db from 30 to 15,000 cycles

3 3/4 in/sec. — ± 2 db from 50 to 7,500 cycles

*If you plan far tomorrow, buy AMPEX today*

*For further details write today to Dept. U-1228A*

- **A NEW MODEL** by the leader in tape recording

Ever since the first AMPEX (the Model 200) set a milestone in progress by making recorded sound "come to life," the broadcasting and recording industries have rightly expected new AMPEX models to set the pace.

- **A NEW SLANT** on operating convenience

With introduction of the AMPEX 350, a new 30° slant on the top plate puts the reels, editing knobs and all controls within easier reach of any operator — tall or short, standing or sitting. Tape editing is faster and less tedious. Servicing is simplified by pivoting of the top plate and sliding out of the internal assemblies.

- **A NEW STANDARD** of reliability

In precision of timing, response to controls and freedom from breakdowns and repairs, AMPEX Tape Recorders have consistently led the industry. For utmost reliability, this new Model 350 has a three motor tape transport mechanism (previously used in the AMPEX 300, but now available in this lower priced machine).

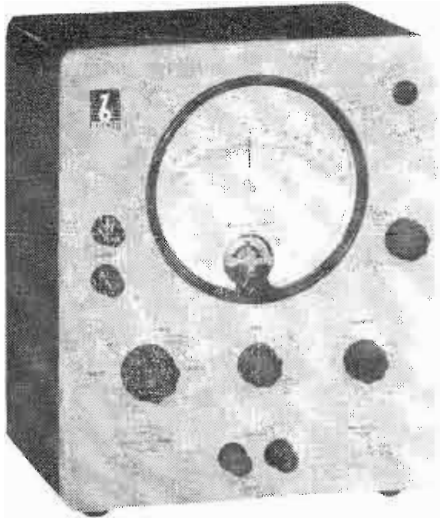
- **A NEW REASON** to change to the best

Ultra high fidelity recording is now priced within reach of discriminating users in every field — radio stations, home high fidelity systems, schools, industry and professional music. And because the AMPEX 350 is built to last, it will cost the least per hour, per week and per year.

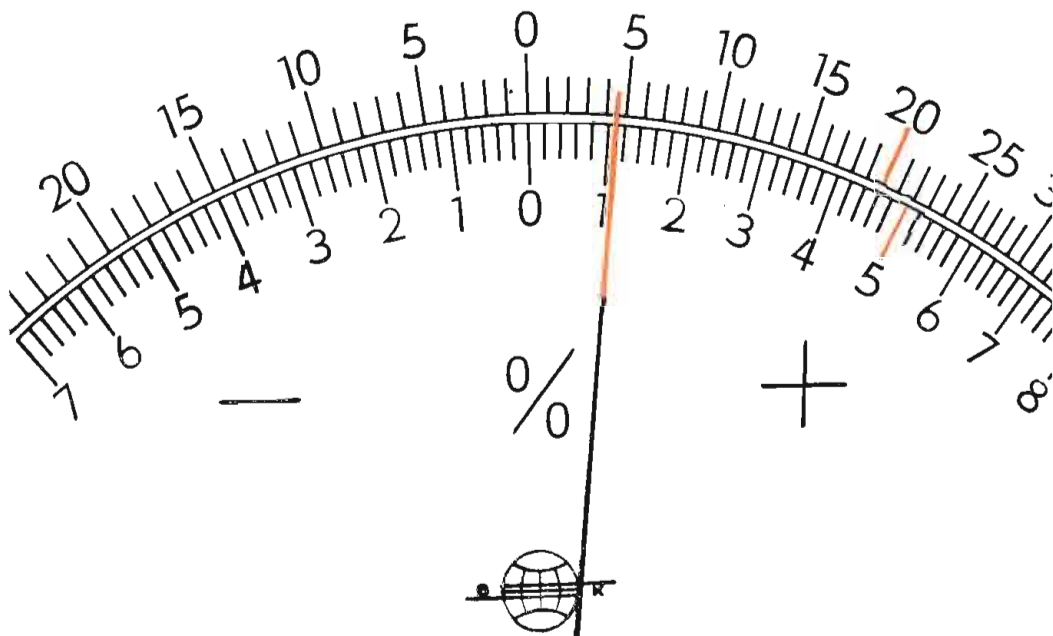
# AMPEX

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OF RESISTANCE,  
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*Actual size photo of center portion of dial.*

**Big, easy-to-read dial speeds inspection**

Now you can have production testing on a high-speed basis with the Bruel & Kjaer Deviation Test Bridge (Model BL-1502). It is designed to test at rates up to 4000 units per hour. The dial, large and simple, is designed to permit fast reading without operator fatigue or inaccuracy.

This precision instrument reports the percentage deviation from a standard of your choice. The measurement can be the resistive, inductive or capacitive deviation characteristic. Write for bulletin. Brush Electronics Company, Dept. FF-6, 3405 Perkins Avenue, Cleveland 14, Ohio. Outside of U. S. A. and Canada, address Bruel & Kjaer, Naerum, Denmark.

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**COMPANY**

*formerly  
The Brush Development Co.  
Brush Electronics Company  
is an operating unit of  
Clevite Corporation.*

**Feedback Amplifiers**

*(Continued from page 105)*

ticular, since the feedback factor is a function of the load impedance, care should be taken to insure that the feedback factor does not exceed a safe maximum value for any anticipated load. The feedback factor is given by Eq. (7). Inspection of this relation shows that it is in the form of the equation of a rectangular hyperbola in the variables  $B_o$  and  $Z_o'$ , dependent and independent respectively. The asymptotes of this hyperbola are  $Z_o' = -(R_i + Z)$  and  $B_o = -\mu k$  for the ordinate and abscissa respectively. Fig. 3 shows typical variations in  $B_o$  as the total load impedance  $Z_o'$  is varied.

Several significant facts can be found from this figure. It should be noted that the relations presented are still valid for amplifiers which employ only simple voltage feedback or only simple current feedback in addition to applying to the combined current and voltage feedback amplifier. The appropriate conditions are then  $R_i = 0$  for simple feedback, and  $k = 0$  for simple current feedback.

The singular case discussed earlier is shown by (b). It should be noted that for this case the feedback is independent of the load impedance. Thus, if an amplifier using the singular or special case of combined feedback is stable in the Nyquist sense for one value of load it will be stable for all loads (except the trivial case where the load is negative in sign and greater in magnitude than  $R_i + Z$ ).

The curves of Fig. 3 are shown dotted to the left of  $Z_o' = 0$  since these values correspond to the case of loads with negative signs, a situation generally of only academic interest. These values were shown for completeness and for presentation of the asymptotic values as an aid in visualization. It is interesting to note that because of the nature of the functions, the sequence of values of  $B_o$  for positive and increasing values of  $Z_o'$  is bounded and monotonic, i.e., each succeeding value of  $B_o$  is either larger or less than the preceding value for curves (c) and (a) respectively. Thus, if the conditions of combined feedback are those for curve (a) the greatest value of  $B_o$  is that for  $Z_o' = 0$  (short circuit load) while if the conditions are those for curve (c) the greatest value is for  $Z_o'$  tending to infinity. If the amplifier is expected to be used with various load impedances, the condition for stability in the Nyquist sense should be determined for whichever load may result in greatest  $B_o$  and hence in feedback factor.

Two amplifiers were designed and constructed to test the validity of the design. The first was a two stage audio amplifier using a 6SK7 pentode driving a 6K6GT output stage. The output was taken off through impedance coupling rather than with an output transformer to allow the use of heavy feedback without danger of oscillation arising from transformer phase shift. A bleeder load of 12K ohms for  $R_1 + R_2$  was assumed. Measurements of the zero-feedback amplifier showed  $\mu = 14.0 \times 10^3$ ,  $Z = 41.6K$  ohms. A feedback ratio,  $1 + B_o$ , of 49 was taken as usable. Designing for an output impedance with 1.8K ohms yielded  $R_i = 22$  ohms and  $k = 0.0135$ .

Using these values for the feedback net resulted in the circuit and performance shown in Fig. 4. The comparison is made between the stable output impedance amplifier and the same amplifier with its output impedance reduced the same amount with voltage feedback alone. It is felt that this is the fairest comparison since when feedback is used to alter the output impedance, systems providing the same degree of alteration should be compared. The curves of Fig. 4 show that the method presented reduces the deviation from design center values by factors of about three to four.

The second test amplifier was a single stage type 6J5GT amplifier. To simply add signal and feedback voltages at the grid a "T" pad arrangement was employed. Using such an arrangement, adequate care was taken to use proper gain values and impedances, noting that the pad provided attenuation in addition to performing the operation of addition. The design conditions for this amplifier were taken as  $\mu = 20$ ,  $Z = 10.3K$  ohms,  $1 + B_o = 5.5$ ,  $Z_i = 7.0$  ohms. A plate load impedance of 50K ohms was selected.

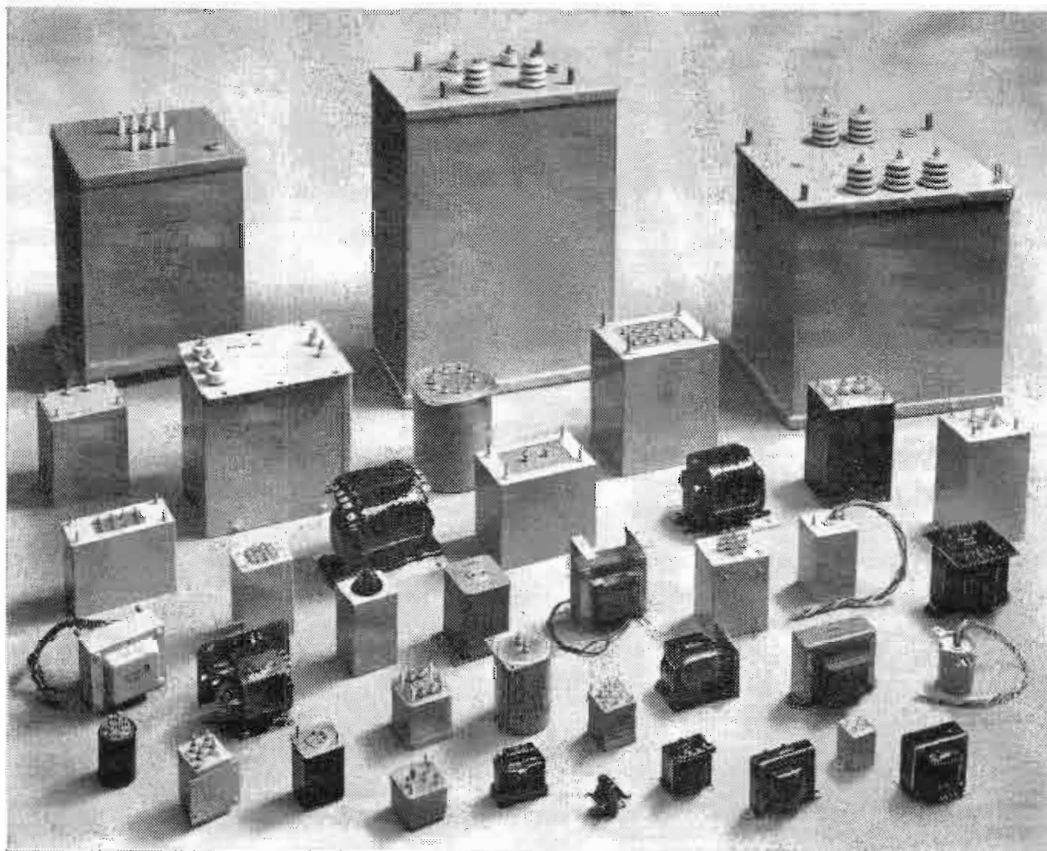
With these conditions the zero-feedback voltage gain was 14.0, measured from the grid to plate. Calculations for  $R_i$  and  $k$  gave values of 1.94 ohms and 0.25 respectively. With a single stage amplifier the current sampling resistor used in current feedback is conventionally used as an unbypassed cathode resistance. This was done in the present case and the resistance was tapped to provide correct bias at the grid return point. The "T" pad was designed to provide a ratio of  $k = 0.25$  between the plate side and the grid, the resulting "T" having series arms of approximately 100K ohms and a shunt arm of 50K ohms. The circuit together with stability tests

(Continued on page 150)

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► to military specifications

► for your special performance requirements



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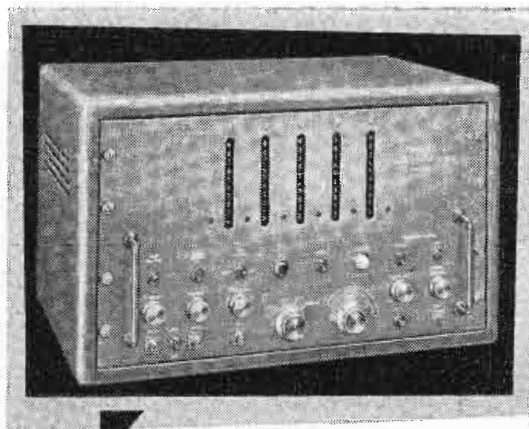


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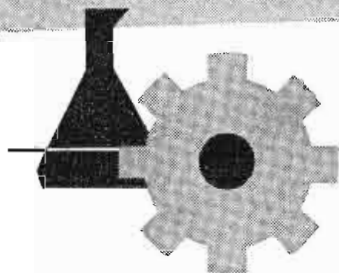
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—and many more. Our engineering staff will gladly assist in adapting this versatile instrument to your special needs.

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**PRINTED READOUT** available for permanently recording data on standard adding machine tape.

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	Frequency Counting	Time Interval Measurement	Period Measurement
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• Accuracy:	$\pm 1$ count (1 sec.) $\pm .0001\%$ (10 sec.)	$\pm 10 \mu$ s	$\pm 10 \mu$ s
• Input Sensitivity:	0.2 to 20 v. RMS	1 v. peak with 1 v. per $\mu$ s rise time	0.2 v. peak, d. c.
• Gate Time (or freq.):	.0001, .001, .01, .1, 1 and 10 sec.	100, 10, 1 kc, 100, 10, 1 cps	1 or 10 cycles of input signal
• Crystal Stability:	1 part in $10^6$ (temp. controlled)		
• Power Requirements:	117 v., $\pm 10\%$ , 50-60 cycles, 200 watts		
• Accessory Socket Connections:	External reset; $\pm 100$ v., 5 ma; + 290 v., 25 ma; 6.3 v. a.c., 2 amps; ground		
• Display Time:	Continuously variable from .5 to 5 seconds		
• Dimensions, Weight:	20 $\frac{3}{4}$ " wide x 12" high x 15" deep; 84 lbs.		
• Price:	\$980.00, f.o.b. Richmond, Calif.		

\* For complete data, please request Bulletin 806

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M-11

for this unit are given in Fig. 5. Comparison was again made between this feedback amplifier and the same amplifier with only voltage feedback used to lower the output impedance to the value used in the first case. Use of the method presented in this paper resulted in reducing the deviation in output impedance from design center values by factors of three to five fold.

It has been shown that use of the feedback system described allows the stable alteration of the output impedance of an amplifier through the use of feedback. However, as is the usual case, this system is not a panacea. Because of the opposite effects of current and voltage feedback upon amplifier output impedance, considerable "cancellation" of altering influences occurs. This requires considerably more overall feedback to effect a given change in output impedance than is required with simple current or voltage feedback.

As mentioned earlier, the limitation on the maximum feedback allowable is imposed on the sum of current and voltage feedback and hence the range of variation of output impedance available using the technique described is appreciably less than that using simple feedback arrangements. It should be noted in this regard that for the two tube amplifier used to verify the design, the output impedance reduction factor was approximately 5.0 so that even though the range of available reduction factors is restricted, appreciable alteration is still possible.

Thus, at the sacrifice of allowable range of alteration, it is possible to utilize this method to change the output impedance so that it is several times more stable against amplifier gain variations than the simple techniques employing only current or voltage feedback. Amplifiers with such stabilized output impedances should find application in many of the instances cited earlier including driver amplifiers for recording meters, transmission lines, distribution systems, loud speaker systems, and other situations where reasonably constant source impedance is required. Used in such applications, the present system provides more stable damping and termination of load equipment. In cases where several loads may be used at different times, an amplifier with stable output impedance allows better prediction of operation and more uniform characteristics in operation.

An excellent general reference on feedback amplifier design for the more advanced is *Network Analysis and Feedback Amplifier Design*, by H. W. Bode, D. Van Nostrand Co., 1945.

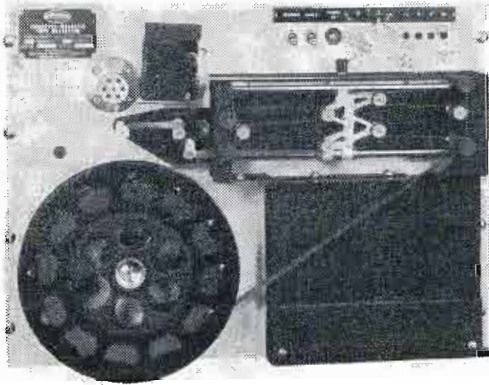
I. B. Passman and J. Ward, "A New Theater Sound System," *Jour. of the SMPTE*, vol. 56, pp. 527, May 1951.



## New Computer Tape Mechanism

A new computer magnetic tape mechanism for recording and storage of digital data has been placed on the market by Raytheon Mfg. Co., Waltham, Mass. The new device offers in a single, compact unit, all of the elements needed for precise, high-speed handling of half-inch magnetic recording tape. It may be operated automatically by pulsed input signals, or controlled manually by a front panel switch. The mechanism moves from stop to start or vice versa in less than five milliseconds. The magnetic head has six channels, narrow gap, with high frequency response. There is a photo reading head that detects printed markings on the back of the tape.

The tension control attained by this mechanism has proved itself more than adequate in the RAYDAC where even

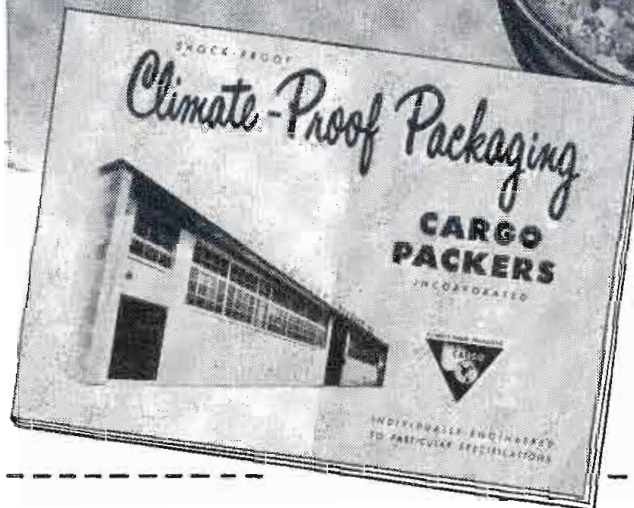


Computer tape mechanism for half-inch magnetic tape features two 1000-foot reels on coaxially driven shafts. Magnetic head has six channels, and a photo reading head detects markings on back of tape. Self-contained power supply operates mechanism at 110 to 125 volts, and will tolerate normal variations up to about 5%.

slight traces of mechanical flutter or variations in tension cause errors in computation. Control is attained by a servomechanism in which tachometers attached to the reel drive assembly and a variable reluctance or microsyn device, detecting displacement of the floating carrier of the slack absorber, serve as error signal sources. The latter are combined with control signals governing the operation of the capstan to control the reel drive motors through a pair of magnetic amplifiers. Slack and tension control is entirely automatic. Adjustments set at the factory can be slightly modified in the field, if necessary.

The reel assembly features two 1000-foot reels mounted side-by-side on coaxially-driven shafts with two reel motors, gear drives, and tachometers. There is an extra idler at the right of the magnetic head assembly which can be set to provide variations in the wrap of tape about the magnetic heads. A wiper pad mounted adjacent to the take-up reel exerts light pressure through a sponge rubber cushion covered with lens tissues, for cleaning the magnetic surface of the tape.

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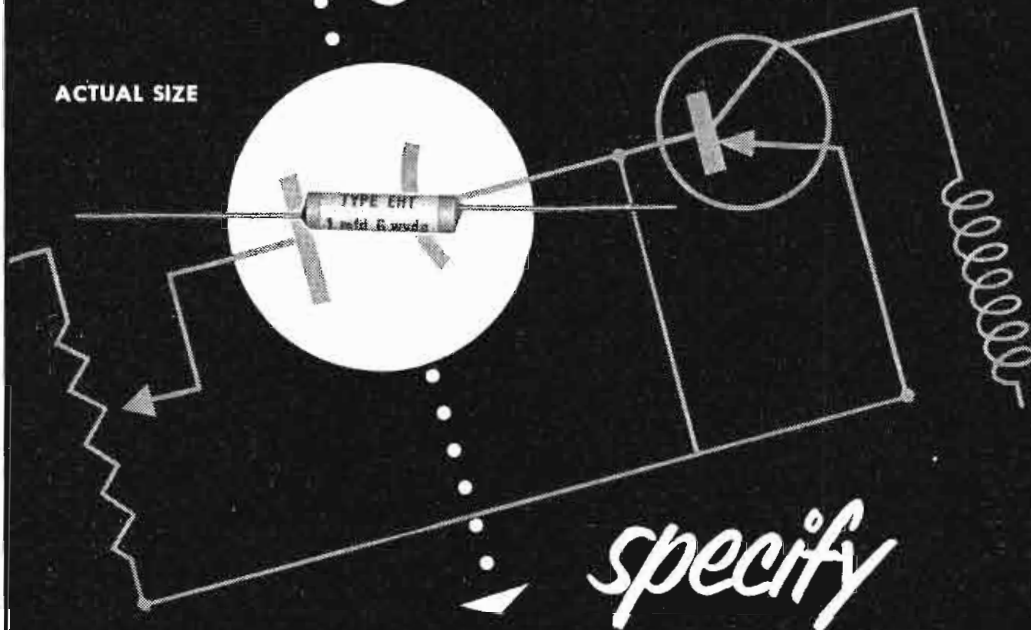


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### LETTERS

(Continued from page 84)

then this ability of the Doppler formula to predict "optimum" and "blind" MTI operation would have been surprising indeed.

Since most conventional MTI radars operate by comparing the phase of returns from successive target pulses, it becomes possible to trick up a special case like that in Mr. Bachman's Fig. 2b where, since the Doppler shift remains identical for each return pulse, a conventional MTI radar will find this target to have a "blind" speed. It would be possible however, to make a radar which would detect the Doppler shift of this target too, and the possibility of this special case does not alter the equivalence of Doppler shift and phase shift explained above.

MYRON PLEASURE  
3713 75th Street,  
Jackson Heights 72, N.Y.

### MTI and the Doppler Myth

Editors, TELE-TECH:

[In reply to Mr. Pleasure's letter] It was not intended that the word "myth" as used in the article "MTI in Pulse Radar Systems and the Doppler Myth" was to imply that there was no Doppler effect, that is, a frequency change in the r-f from moving targets. According to definition, the Doppler principle, developed by the Austrian physicist Christian Doppler (1803-1853), states that the frequency of an observed signal differs from the frequency of the signal source whenever the observer or source is moving. Based on this definition persons unfamiliar with MTI receivers tend to believe that the r-f frequency change is the important factor in present MTI operation.

The Doppler frequency shift in a returning echo signal is dependent only on the radar frequency and the radial velocity of the target. As shown in the mathematical analysis an MTI receiver actually measures the number of electrical degrees that a target moves between pulses. This distance, in electrical degrees, is dependent on the radar frequency, the radial speed of the target and the radar PRF.

Because trigonometric functions of angles differing by  $360^\circ$  are identical, this measurement of electrical degrees of target travel results in blind speeds. Angular changes of  $180^\circ$  having the proper relative phase with respect to the reference signal result in optimum speeds. The angle actually measured is twice as large as the number of degrees traveled by the target. A blind speed occurs whenever a plane travels a multiple of  $180^\circ$  between pulses. An optimum speed occurs whenever a plane travels an odd multiple of  $90^\circ$  between pulses and there is the proper phase relationship between echo signal and reference signal.

Based on this method of operation we can account for the fact that the blind and optimum target speeds can be changed by changing the PRF. Since the Doppler frequency shift as defined, does not depend on the radar PRF, an

MTI receiver depending on the frequency shift as such, should have neither blind nor optimum speeds but rather an output dependent on target speed alone.

The conditions under which the Doppler frequency can be used to predict blind and optimum speeds was developed only as an interesting side light from the equation of the number of electrical degrees traveled by a plane between pulses. These conditions were that

WHEN

$f_d = [(2n + 1) PRF]/2$  there is an optimum speed condition and

WHEN

$f_d = n PRF$  there is blind speed condition.

Since  $f_d$  is not a function of PRF,  $f_d$  by itself is not capable of determining blind and/or optimum speeds.

As stated in the article, Fig. 2 was drawn to illustrate possible, but not probable, ways in which a target could move and create a Doppler frequency shift only or a change in distance only. Target movement as in 2b will not result in a blind speed but will be blind regardless of speed. Targets moving as in 2c will be blind or optimum or somewhere in between depending on plane distance traveled between pulses, and radar frequency.

I hope that this added information will help to clarify those points in the original article which may have caused some confusion.

JOHN F. BACHMANN  
Bendix Radio  
Baltimore 4, Md.

## Communications Group Meets

The IRE Professional Group on Communications Systems is holding a symposium on June 11-12 at the AT & T Building in New York City. The technical program includes: "Solar Research and Its Application to High Frequency Communication Systems." Contributors are: W. A. Miller and A. B. Moulton, RCA Labs.; J. H. Rush, Harvard U.; W. O. Roberts, U. of Colorado; J. H. Nelson, RCA Communications.

"Tangier Relay System," by C. G. Dietsch, RCA Communications.

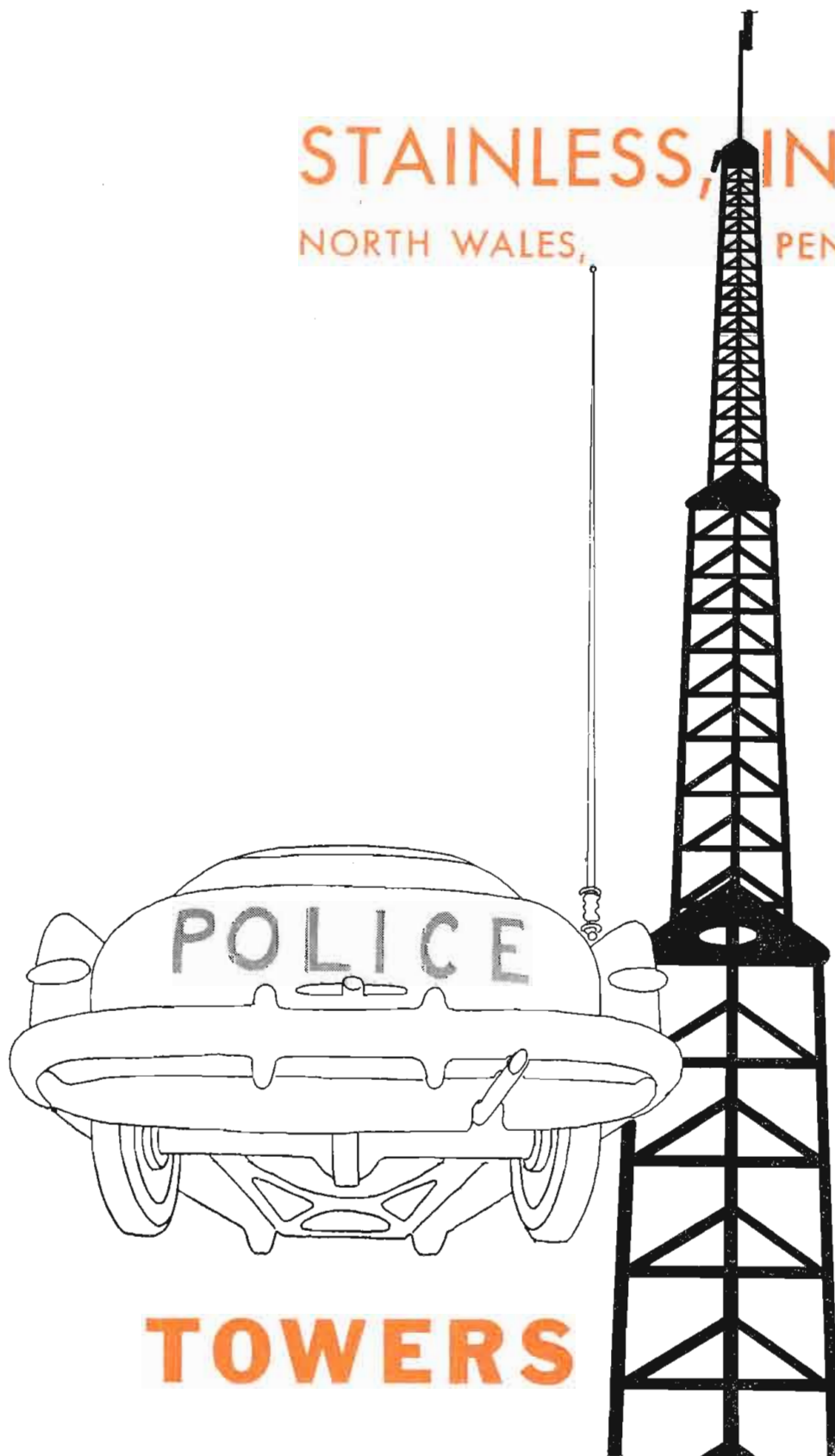
"LD-T2 Transmitter," by N. F. Schlaack, Bell Telephone Labs.

"Overseas Radio Telephone System," K. P. Stiles, AT & T Long Lines Dept.

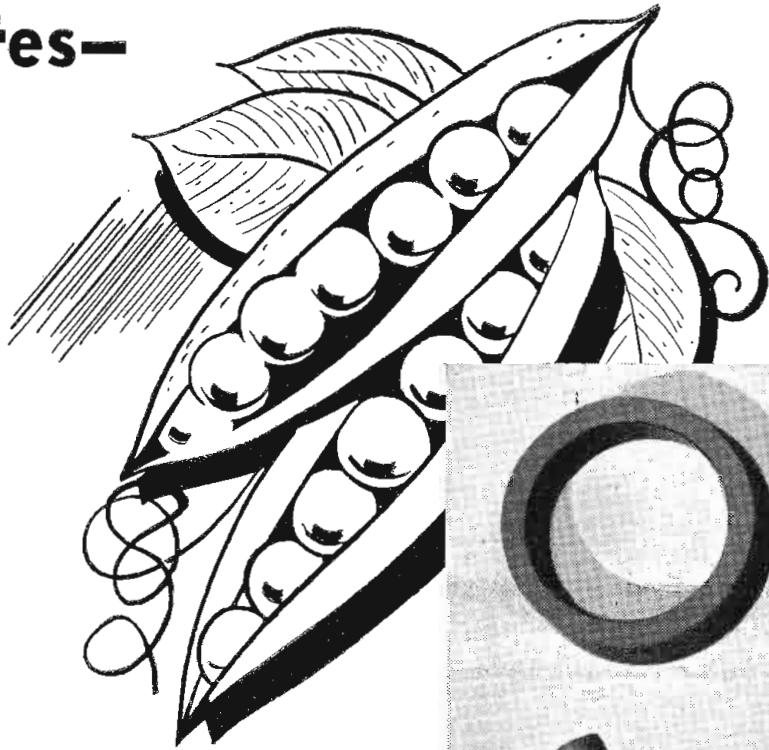
## Airborne Group Name Change

The IRE Professional Group on Airborne Electronics is balloting all its members for a change in name to Professional Group on Aeronautical and Navigational Electronics. This new name reflects the enlarged field of interest actually covered by the Group, and is expected to be approved.

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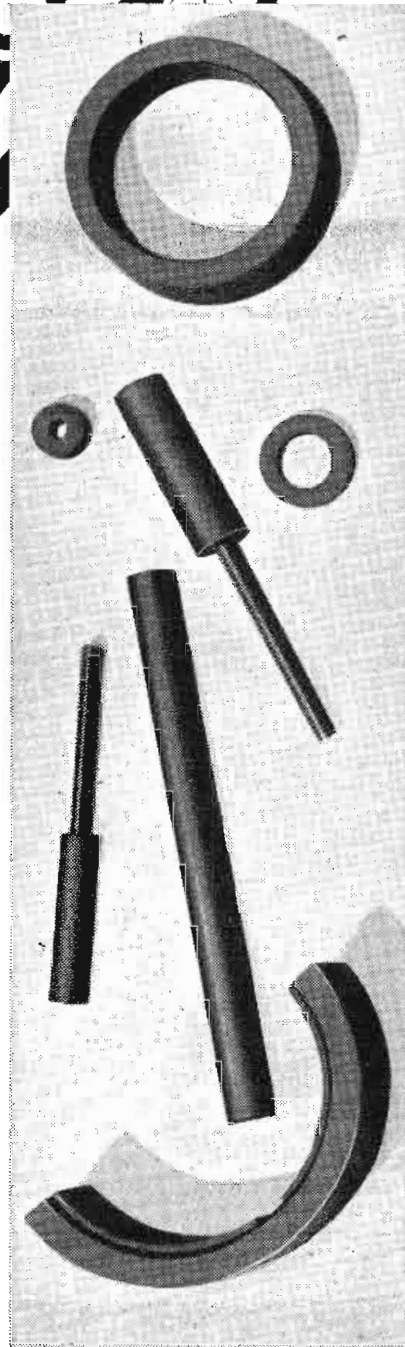
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## Heat Transfer

(Continued from page 113)

motor speed. The decrease in cooling capacity caused by the decrease in air density at high altitudes is compensated to a certain extent by the decrease in air temperature. Typical cooling curves will show a maximum cooling effect at some intermediate altitude, with the worst condition either at sea level or at maximum altitude.

The ram-air temperature developed at speeds near Mach 1 may be as high as 100°C with sea level, desert-air conditions. This is higher than the temperature ratings of many components. At altitudes above 50,000 ft. the air becomes thin and extremely inefficient as a coolant. Because of these difficulties, future designs of electronic equipment for aircraft must allow for higher temperatures or must provide some type of refrigeration. A trend toward the use of high-temperature components, which could be air-cooled in a high-temperature environment, has been evident for some time. However, an opposing trend is now beginning to get under way. This trend is toward the greater use of such low-temperature components as germanium diodes and transistors because of their lighter weight and lower power requirements.

The use of these components and the greater utilization of hermetic sealing techniques will require the development of a better cooling system for electronic equipment in aircraft than the systems now commonly used. Hermetically sealed plug-in units of high heat density cannot be properly cooled by air without the addition of weight in fins and air ducts. Conduction cooling to a mounting plate, which in turn is cooled by a refrigerant, would seem to be a natural solution. The development of a high-capacity refrigeration system suitable for aircraft use appears desirable and may be essential in the near future. Such a system is needed for precision equipment which must be operated with stable temperature conditions as well as for transistors and hermetically sealed units.

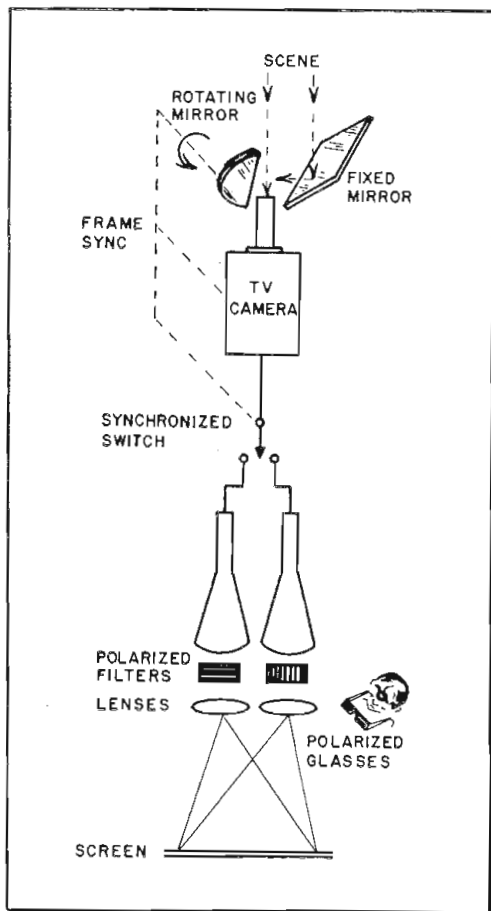
### Price Reduced on Magna-Stripe Service

The Reeves Soundcraft Corporation has reduced the price for their magna-stripe process on 16-mm developed prints. Frank B. Rogers, Jr., vice president, announced that the new list price would be 2½ per foot effective April 27th, 1953. The previous list was 3½ cents per foot.

### 3-D TV on ABC

Three-dimensional TV has progressed another step with the experimental system developed by American Broadcasting Co. engineers Glenn Akins and Alex Quiroga, under the direction of Cameron Pierce, chief engineer of KECA-TV, Los Angeles. A live and film program originating at KECA-TV was transmitted from Mt. Wilson by microwave relay. Although there is room for improvement, the system definitely showed the vast potential of the medium.

In operation, a rotating mirror disc in front of the TV camera rotates in sync with the TV frame rate. Half of



New 3-D TV system employs rotating mirror to provide two polarized images from one camera

the time (1/60 second) the disc leaves the camera unobstructed, permitting a direct view of the scene. This represents the left eye view. During the next 1/60 second, the rotating mirror obstructs the direct view, but reflects into the camera the scene viewed by a fixed mirror 3 in. from the camera lens. This is the right eye view. A switch in sync with the disc feeds the two pictures alternately to two 5-in. picture tubes, essentially displaying one field on each. This minimizes flicker, but reduces resolution to 262 lines. The displays pass through filters, one polarized horizontally and the other vertically, and are projected on a 4 x 5 ft. screen. The 1/60 second pictures flash on the screen one at a time, in rapid succession. The viewer observes the screen with glasses polarized to correspond with the filters. For more information, see the May 1953 issue of TELE-TECH & ELECTRONIC INDUSTRIES, page 66.

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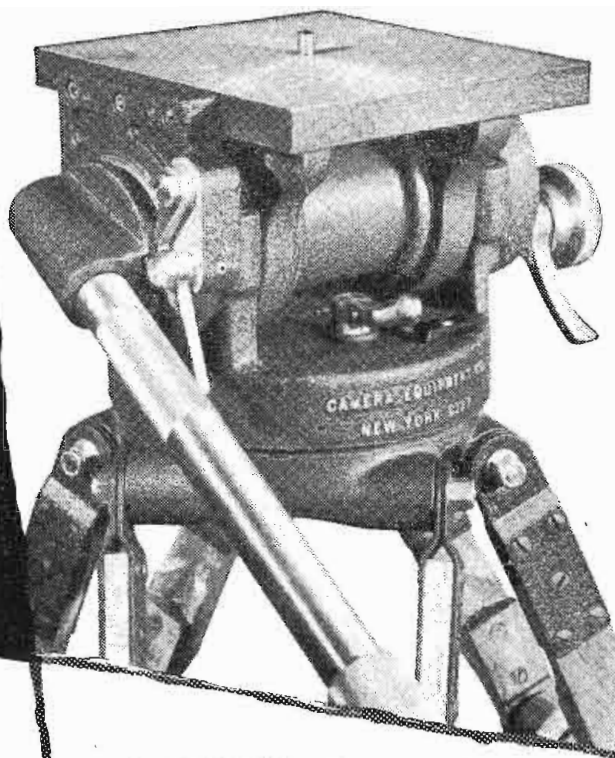
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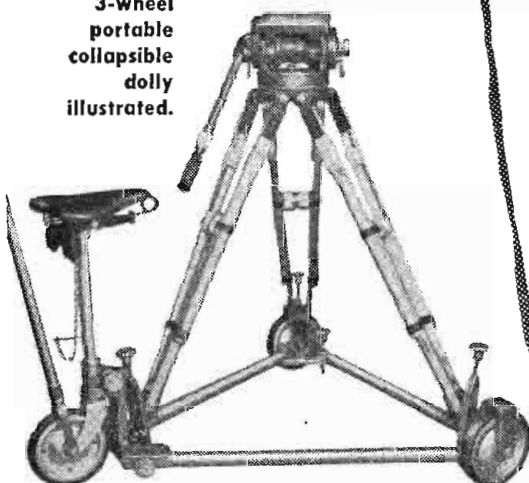
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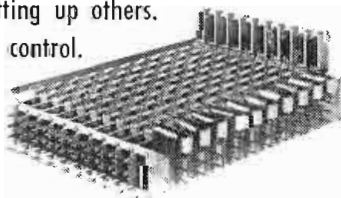
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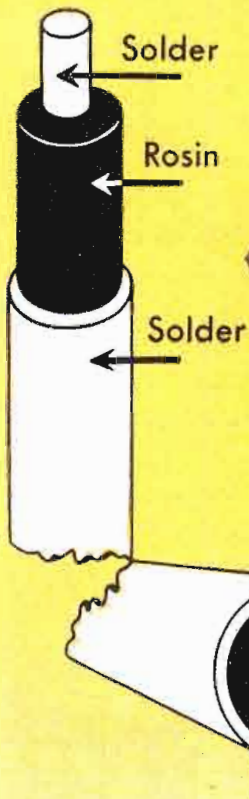
(Continued from page 119)

ganization in a medium sized plant. Sometimes the Quality Control Organization includes line inspection and test, and sometimes it does not. In many companies a distinction is made between quality control and quality control, but for this article, let us assume that quality control is the function which controls the application of the standards, and acts as judge of good from bad in the plant. In order to follow this out it is necessary that all inspection check lists and training of inspectors be done under the jurisdiction of the Quality Control function. It is not essential that the individual testers and inspectors report to the Quality Control Supervisor administratively, but it is necessary that they report functionally to Quality Control.

The second step is to set up a Quality Control Department even if it is only one man, with jurisdiction over such activities as Incoming Material Inspection, Process Quality Control, Finished Product Quality Assurance, and Gage Control. See Fig. 2. It is necessary that the paperwork procedures and material movement procedures insure that only acceptable incoming material is placed into stock. This brings in the Purchasing and Receiving Departments Material Control Dept., and also the Engineering Dept. on technical questions concerned with specifications for incoming material. It is usually best for the man designated as Quality Control Supervisor, or his agent, to coordinate all these activities, and see that all questions concerned with incoming material are handled expeditiously and correctly.

The third step is the establishment of an Incoming Inspection Department, with proper control of the quality assurance function, at minimum cost. Here is an important place to show attempts at correction of troubles, since it is relatively easy to set up a rejection report system with copies to the Purchasing Department for notification to the vendor. This should be done on a formal, not verbal basis, since such reports are not only helpful in prevention of troubles, but serve as objective evidence of corrective action.

The fourth step is to establish a material identification system including inspection stamping, if practicable to assure that only acceptable material is placed into stock. Routing sheets, or operation sheets, to prove the status of material in process are also a good idea. Segregation of Government Furnished  
(Continued on page 364)



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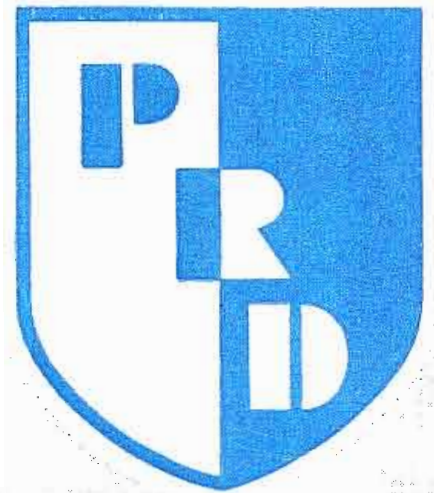


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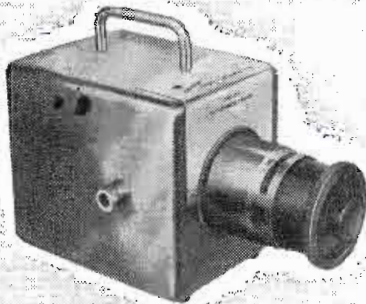
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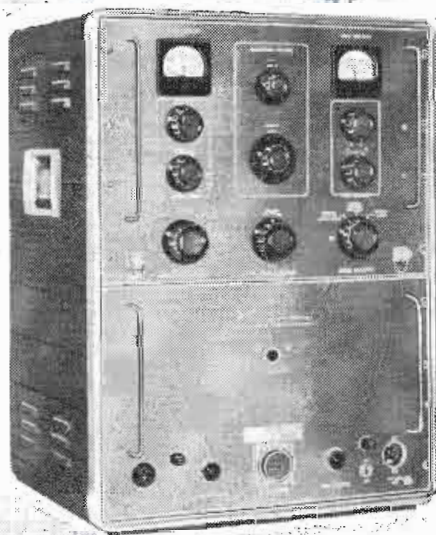


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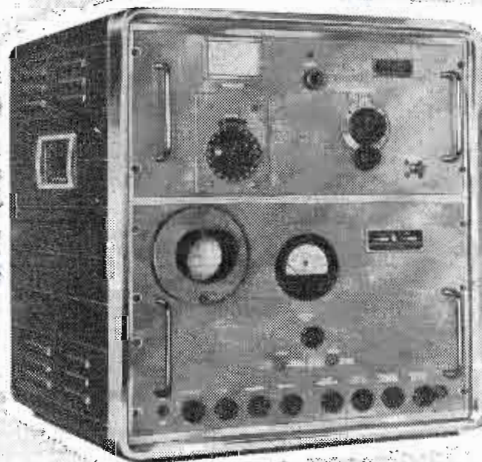
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	7.05—10.0	576	1 1/4 x 5/8	R
	8.2—10.0	585-A	1 x 1/2	R
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In addition to the General Purpose Frequency Meters listed above, PRD manufactures a complete line of Precision Frequency Meters covering the entire frequency range from 0.55 to 39.0 kmc/s. Transmission line sizes include 3/8" coaxial line and all standard wave guide sizes from 0.280" x 0.140" I.D. to 2" x 1" O.D. All types are available in Reaction and Transmission styles.

The Type 500 Frequency Standard Multiplier is available to generate standard frequency signals in the UHF and microwave regions when used with the Type 612-A Tunable Crystal Mount.

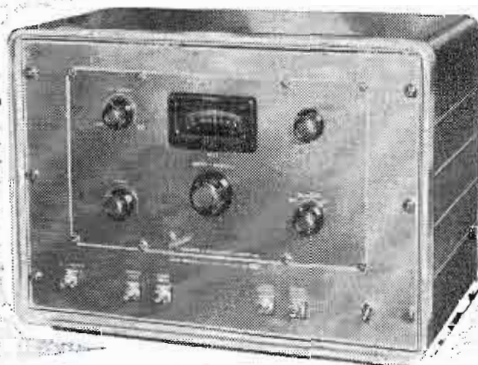
**SIGNAL SOURCES AND RECEIVERS**

ITEM	DESCRIPTION
<b>TUBE MOUNTS</b> Type 701 Type 702 Type 703	For type 2K28 klystrons, 2.400—3.445 kmc/sec For type 2K25 klystrons, 8.50—9.60 kmc/sec, 1 1/4 x 5/8 waveguide For type 2K25 klystrons, 8.50—9.60 kmc/sec, 1 x 1/2 waveguide
<b>OSCILLATORS</b> Type 705 Type 706	Covering the frequency range from 7.0 to 11.0 kmc/sec Covering the frequency range from 3.6 to 7.3 km/sec
<b>POWER SUPPLIES</b> Type 801-A	Providing all required electrode voltages to operate a wide variety of klystrons, plus internal modulators
<b>SPECTRUM ANALYZERS</b> Type 853 Type 854 Type 855	Covering the frequency range from 2.40 to 3.40 kmc/sec Covering the frequency range from 8.50 to 9.60 kmc/sec Combining both of the above ranges in one instrument
<b>GENERATORS</b> Type 902 Type 903 Type 907	Covering the frequency range from 3.65 to 7.30 kmc/sec Covering the frequency range from 7.00 to 10.5 kmc/sec Covering the frequency range from 40 to 900 mc/sec
<b>NOISE GENERATORS</b> Type 904	For the direct measurement of noise factors in the range of 10 to 1000 mc/sec

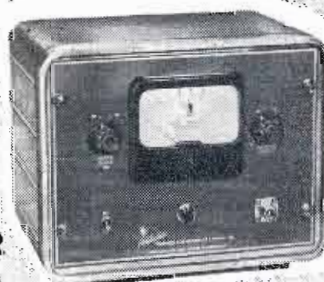


**Type 854  
UNIVERSAL  
SPECTRUM  
ANALYZER**  
8.5—9.6 kmc/s

**Type 907  
BROADBAND  
SWEEP  
FREQUENCY  
GENERATOR**  
40-900 mc/s



**Type 904  
VHF-UHF  
NOISE  
GENERATOR**  
.01—1.0 kmc/s



**Type 275  
VOLTAGE STANDING  
WAVE RATIO AMPLIFIER**  
300—2000 cps



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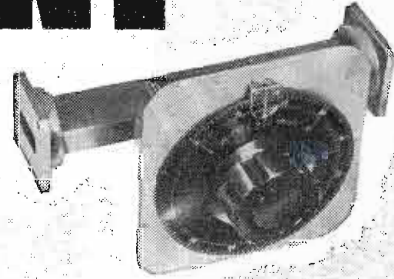
from **VHF** through **EHF**

# PRECISION RF TEST EQUIPMENT

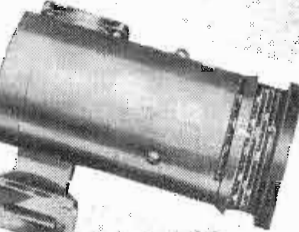
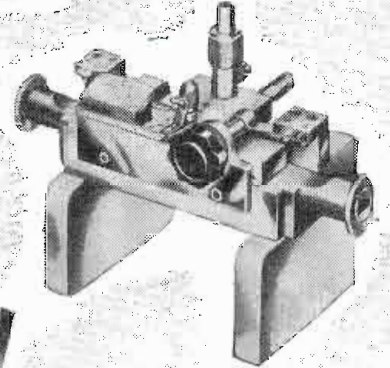
Type 312  
E/H TUNER  
26.5-40.0 kmc/s



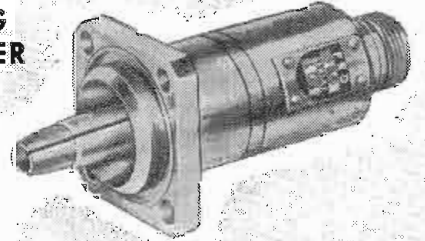
Type 196-B  
VARIABLE  
ATTENUATOR  
8.20-12.4 kmc/s  
0-40 db



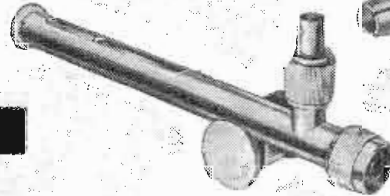
Type 211  
PRECISION WAVEGUIDE  
SLOTTED SECTION  
18.0-26.5 kmc/s



Type 585  
DIRECT READING  
FREQUENCY METER  
8.20-10.0 kmc/s

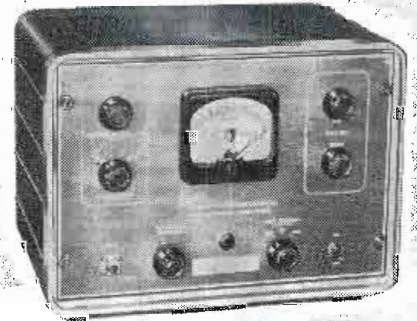


Type 389  
COAXIAL  
TRANSMISSION  
LINE ADAPTER  
0-4.0 kmc/s



Type 612-A  
CRYSTAL BOLOMETER  
MOUNT  
1.00-12.4 kmc/s

Type 650-A  
UNIVERSAL  
POWER BRIDGE  
0.1, 1.0, 10, 100  
mw full scale



ITEM	COAXIAL (Nom. O.D.-in.)		TRANSMISSION LINE SIZE WAVEGUIDE (Nominal O.D.-inches)							
	7/8	3/4	3x1 1/2	2x1	1 1/2x 3/4	1 1/4x 3/4	1x 1/2	0.622x	0.420x	0.280x
								I.D.	I.D.	I.D.
<b>Variable Attenuators Uncalibrated</b>			171	162	1156 161	160	154-A 159	189	190	191
<b>Dial Precision</b>			174-A	169-B	177-B	184-A	196-C 196-D	187		
<b>Cut-off</b>		181,198					180			
<b>Fixed Attenuators Low Power</b>	136 series	130 series 1100-C	s	s	s	s	140 series	s		
<b>Terminations</b>	145	139	129	115	121	114	116	131	132	133

## ATTENUATORS AND TERMINATIONS

TRANSMISSION LINE COMPONENTS										
<b>Waveguide to Coaxial Adapters</b>			365	357	356	355	354-A			
<b>Coaxial Transitions</b>	389,390 391,392	389,390 391,392								
<b>Directional Couplers</b>			400	404	401	402	405			
<b>Waveguide Stands</b>			375-A	376-A	377-A	378-A	379-A	386-A	387-A	388-A
<b>Flange Bolt &amp; Nut Assemblies</b>			369-A	369-B	369-B	369-C	369-D	369-E	f	f
<b>Bends and Tees</b>				s	s	s	462 465 481	s	s	s

## IMPEDANCE MEASUREMENT & TRANSFORMATION

<b>Slotted Sections</b>	200-C	205-A 215-A	209-A	201-A	204-A	202-A	203-A	210	211	212
<b>Tuners</b>		306	309	300	305	302	303-A	311 314	313	312

The Type 250-A Broadband Probe is designed for use with the Types 200-C through 209-A and 215-A Slotted Sections; Types 210-212 are supplied with built-in tunable probes. The Type 361 R-F Adapter is available for use with the Type 250-A Probe.

## DETECTION AND POWER MEASUREMENT

<b>Detector Mounts Crystal</b>		612-A 613					601	616	621	615
<b>Bolometer</b>	(s)	612-A,613 627-A,628-A						616	620 621	618
<b>Thermistor</b>							635			

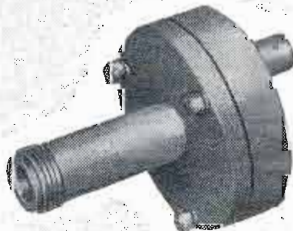
The Type 650-A Universal Power Bridge is designed to be used with any of the bolometers or thermistors listed for the measurement of absolute power level.

## BOLOMETERS

TYPE No.	FOR USE WITH	TYPE No.	FOR USE WITH	TYPE No.	FOR USE WITH
610-A	250-A, 612-A, 613	629-A(s)	623(s)	630-B(s)	626(s)
614	210, 211, 616, 621	629-B(s)	624(s)	631-C	627-A
617	212, 618, 620	630-A(s)	625(s)	631-D	628-A

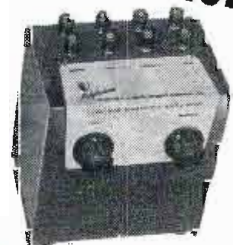
--Equipment is supplied with captive flange screws  
--Available on special order only

Type 627-A  
BROADBAND COAXIAL  
BOLOMETER MOUNTS  
3-10.0 kmc/s



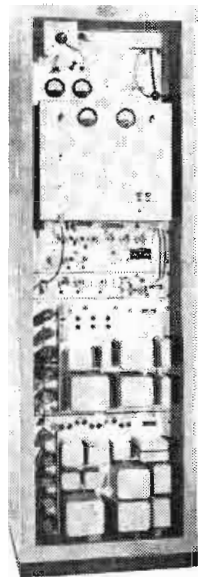
## AND NOW IN PRODUCTION! PRD Magnetic Amplifiers

Our Magnetic Amplifier Division is now in production to meet your needs with custom designs or "packaged" units. The T806 is a low level amplifier which will amplify a signal from a thermocouple, strain gauge, thermistor bridge, photo tube, etc., to operate an insensitive meter or relay.



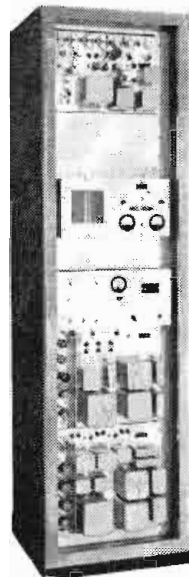


has no equal in excellence for FM point-to-point radio relay multiplexing equipment in the range 70 to 2000 MC with band widths up to 300 KC for as many as 50 voice circuits.



Type 752A (Special).  
350 to 400 MC. Bandwidth  
250 cycles to 60 KC. Power  
80 watts.

### Typical Equipments



Type 695M-755 CM.  
Transmitter-Receiver Terminal.  
152-174 MC. Bandwidth. .2 to  
20 KC. Transmitter power 20  
watts. Receiver sensitivity 1.6  
microvolts.

**REL** frequency modulation radio transmitting equipment employs the **SERRASOID** modulator having no tuned circuits and requires only standard receiving type tubes.

**REL** FM radio installations are unique in quality and reliability. Join the rapidly growing list of companies who have successfully solved their radio multiplex circuit problems by employing REL know-how and equipment.

**REL** engineering consultation is available if you are planning new or modified telephone facilities.

Canadian Representative: Ahearn & Soper Co., Ltd., P.O. Box 794, Ottawa



**RADIO ENGINEERING LABORATORIES, Inc.**

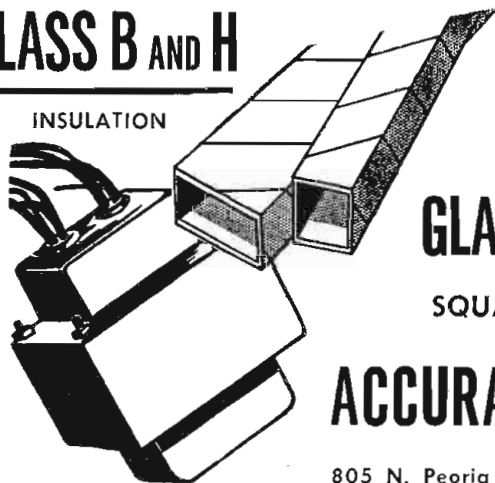
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TWX NY 4-2816

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## Sweep Generator

(Continued from page 118)

ing a position in the frequency range of the traveling-wave tube which, in the fourth trace, is shown on the expanded narrow-band position.

Figs. 9 and 10 are front and rear view photographs of the present form of the equipment. The indi-

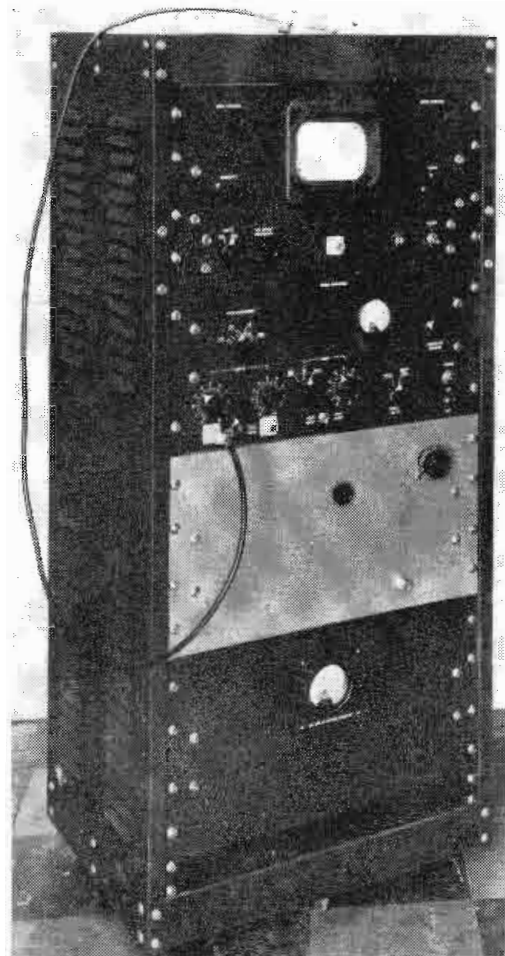


Fig. 9: S-band sweep generator and test set

vidual chassis units from top to bottom are: scope and sweep circuits, tuned amplifier, r-f components and klystrons, power supply. The bolometer detector is connected to the amplifier input in Fig. 9.

### Conclusions

A low-power S-band sweep frequency generator and test set has been built which provides a visual representation of the frequency response of S-band components on a long-persistence CRT. With this unit and an external frequency motor, bandwidths may be measured with an accuracy of a few percent and tunable components may be easily tuned by direct observation of their insertion loss or impedance match over a wide range of frequencies.

The unit provides a 1000-MC sweep covering the range from 2600-3600 MC or a 100-MC sweep continuously variable over a range from 2600-

(Continued on page 162)

# MINIATURE IN SIZE - GIGANTIC IN PERFORMANCE

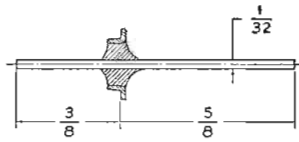
## FUSITE GLASS-TO-METAL HERMETIC TERMINALS

These Miniatures . . . . . Now Available in these Electrode Treatments

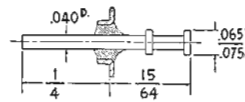
1000 V  
Flange  
Diameter  
.200  
Mounting  
Hole  
 $\frac{1}{8}$ "



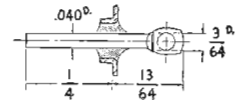
Illustrated  
#104 THFP



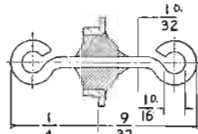
104 SW



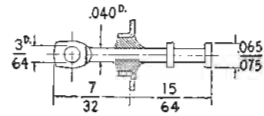
104 THSW



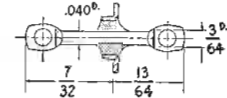
104 FPSW



104 L



104 THFP



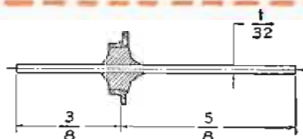
104 FP

### 104 SERIES

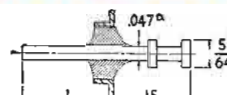
1500 V  
Flange  
Diameter  
.250  
Mounting  
Hole  
 $\frac{3}{16}$ "



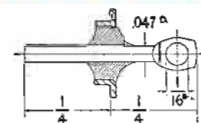
Illustrated  
#105 THSW



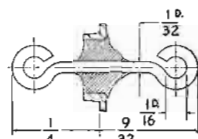
105 SW



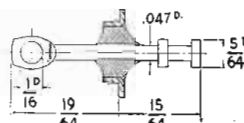
105 THSW



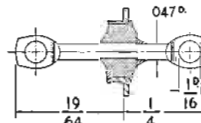
105 FPSW



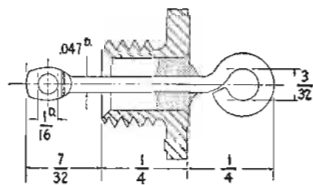
105 L



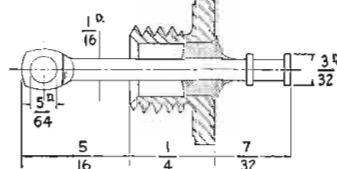
105 THFP



105 FP



105 TB Loop FP



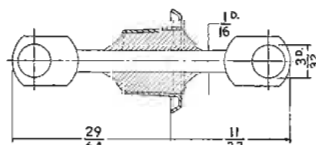
105 TB THFP

### 105 SERIES

1500 V  
Flange  
Diameter  
 $1\frac{1}{4}$ "  
Mounting  
Hole  
 $\frac{3}{16}$ "



Illustrated  
#106 FP



106 FP

### GENERAL SPECIFICATIONS

**MATERIALS**—C. R. Steel disc and steel electrodes. Interfused with glass.

**PRESSURE TEST**—12 pounds gauge.

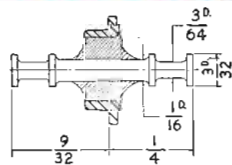
**INSULATION TEST**—10,000 megohms after salt water immersion.

**SUDDEN THERMAL SHOCK TEST**—dry ice to boiling water.

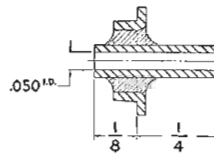
2000 V  
Flange  
Diameter  
 $\frac{5}{16}$ "  
Mounting  
Hole  
 $1\frac{1}{4}$ "



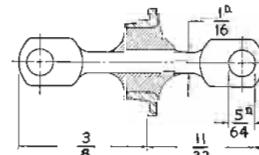
Illustrated  
#107 BLHT



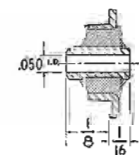
107 TH



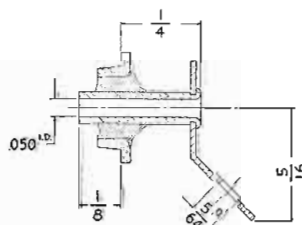
107 HT



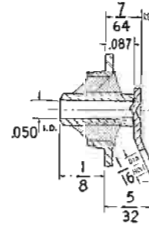
107 FP



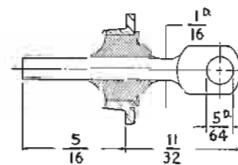
107 HT (Short)



107 HTL

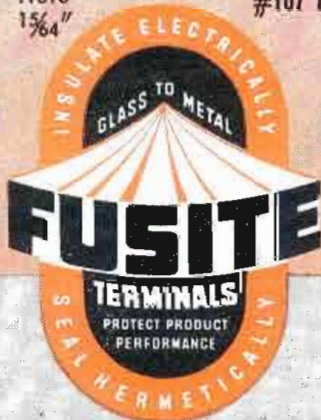


107 BLHT



107 FPSW

### 107 SERIES



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3800 mc. Extended ranges may be set up with the unit by adjustment of klystron settings and the use of a crystal current monitoring stub covering the new range of frequencies. The S-band power output over

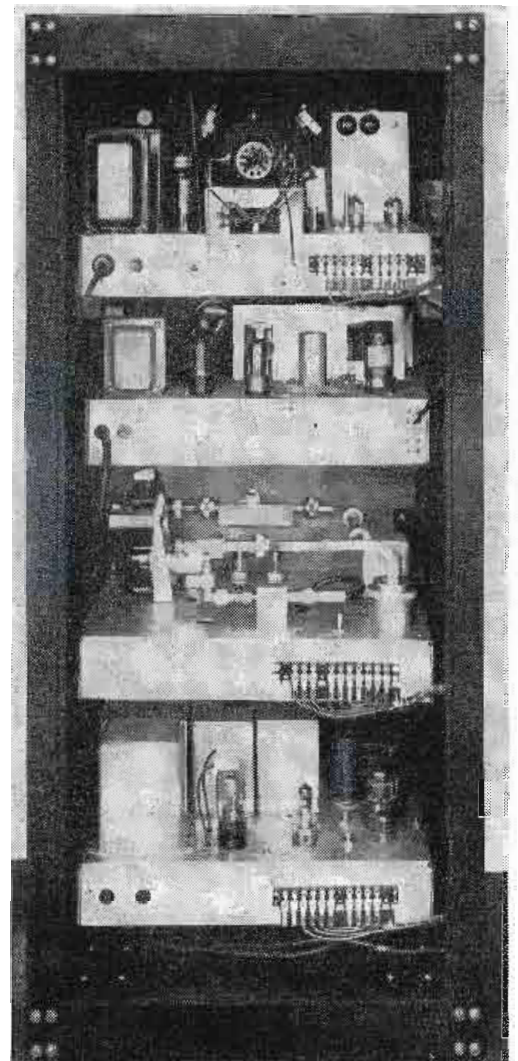


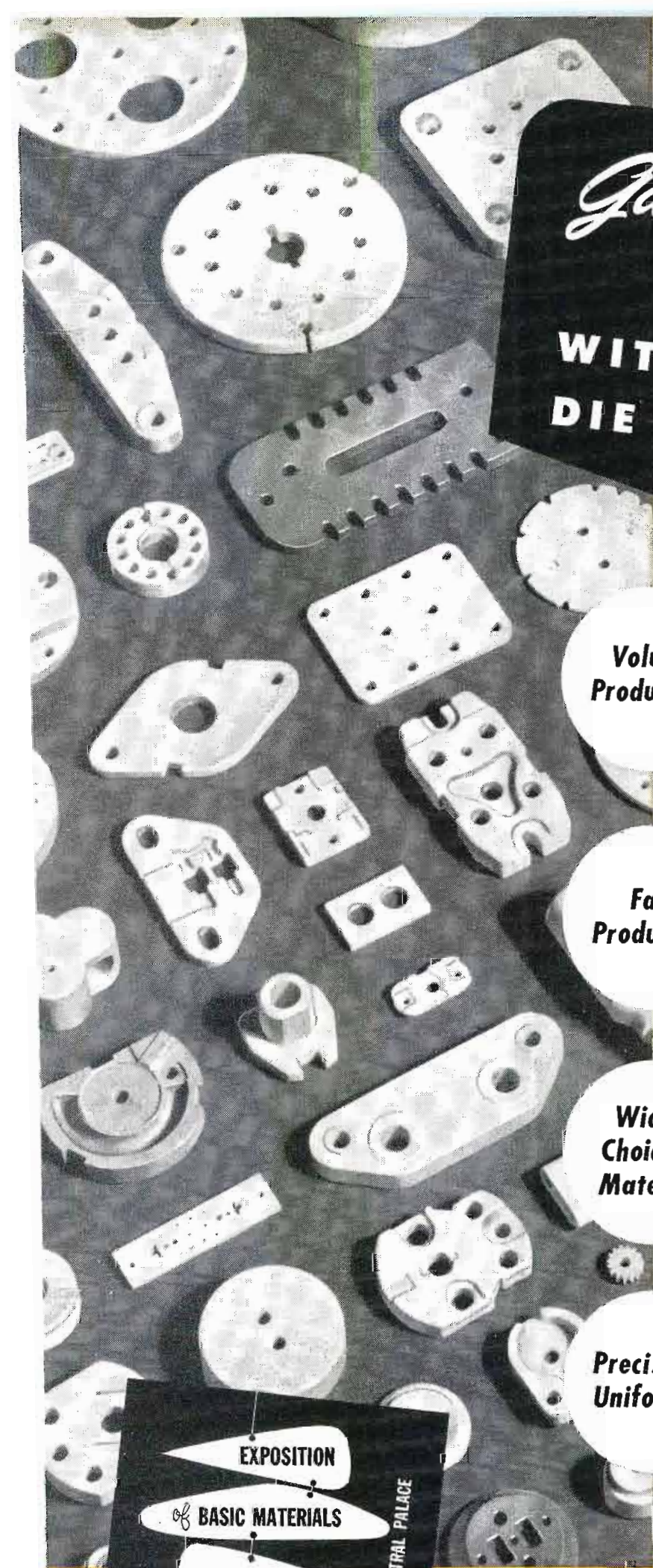
Fig. 10: Rear of sweep generator and test set

the frequency ranges mentioned above is flat to within 1.5 db on the wideband position and 0.5 db on the narrowband position. The maximum S-band output is about 40  $\mu$ w average power terminating in a type-N 50-ohm connector.

### Output Variations

The variation in S-band power output is primarily due to a variation in power output of the tunable 2K50 klystron as it sweeps over its frequency range. This causes a variation in crystal current flowing in the mixer crystal which in turn varies the conversion efficiency of the mixer to S-band power. It should be possible with improved control over the sweeping voltages on the tunable klystron and with some crystal units in the mixer to obtain an even smaller variation in S-band power output.

The authors wish to express their  
(Continued on page 164)



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# NEW Type 2113, 12-Channel PICTURE SIGNAL GENERATOR

for Production Testing and Closed-Loop T.V.



The Type 2113, 12 Channel Picture Signal Generator has been specifically designed for production line testing of TV receivers. Used in conjunction with the equipment listed below, the manufacturer can produce his own "Indian Head" test pattern and is no longer dependent on local transmissions. This signal generator has also received wide acceptance for dealer demonstrations of TV receivers in areas where transmitting facilities are not yet available.

## SPECIFICATIONS

**OUTPUT SIGNALS AND ACCURACY:** Picture and sound R. F. signals on all 12 standard TV channels. Picture carrier accuracy 0.01%; sound carrier better than  $\pm 4.5$  KC of "standard" on all channels.

**PICTURE CARRIER OUTPUT:** At least 50,000 microvolts into a 75 ohm terminated coaxial cable.

**R. F. OUTPUT IMPEDANCE:** Output is into a 75 ohm coaxial cable. Two probes are supplied for use with 75 ohm cable to match 75 or 300 ohm receiver antenna input circuits.

**VIDEO INPUT IMPEDANCE:** 75 ohms single ended.

**VIDEO INPUT:** Minimum 1 Volt Peak to Peak, black negative polarity.

**PICTURE CARRIER MODULATION:** Continuously variable 0 to 87%.

**D. C. RESTORER:** A D.C. restorer is provided to maintain constant average picture brightness when using program material for video modulation.

**SOUND CARRIER DEVIATION:** Continuously variable 0 to 40 KC.

**SOUND MODULATION:** Modulation from 400 cps internal oscillator or external signal such as music. Input either high impedance, unbalanced, or 600 ohms balanced. Either input can be selected by front panel switch.

*These other TIC Instruments complete the "package"*

**TYPE 2120 PICTURE SIGNAL GENERATOR:** A single channel TV transmitter for use where a high percentage of picture modulation is required for checking inter-carrier buzz.

**TYPE 1311 VIDEO DISTRIBUTION AMPLIFIER:** A 5 channel amplifier recommended where multiple 75 ohm, unity gain outlets are desired.

**TYPE 2200 SYNC. SIGNAL GENERATOR:** Provides all necessary RTMA sync, blanking and drive signals plus linearity blanking, in either polarity, for monoscope or studio camera operation.

**TYPE 2300 MONOSCOPE:** A "must" for checking linearity, resolution and smear in TV receivers and video distribution facilities. Recommended for use with Type 2200 Sync-Generator.

**TIC** Manufacturers of a Complete Line of TV Test Equipment  
**Tel-Instrument Co. Inc.**  
50 PATERSON AVENUE • EAST RUTHERFORD, N. J.

appreciation to Messers Isaac W. Fuller and Gunnar P. Ohman for their suggestions and guidance during the course of this project and the preparation of this paper.

## REFERENCES

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  2. Montgomery, C. G., *Technique of Microwave Measurements*, Rad. Lab. Series, vol. 11, p. 800, 1947.
  3. Ragan, G. L., *Microwave Transmission Circuits*, Rad. Lab. Series, vol. 9, p. 173, 1948.
  4. Chance, B., Huges, V., MacNichol, E. F., Sayre, D., and Williams, F. C., *Waveforms*, Rad. Lab. Series, vol. 19, p. 199, 1949.
- This paper was presented at the National Electronics Conference held in Chicago, Sept. 29-Oct. 1, 1952.

## TV-on-Tape Quality Reported Improved

Bing Crosby Enterprises, Inc., has reported several improvements in the performance of their TV tape recording equipment, and expects to have it available for commercial use by next year. According to chief engineer John T. Mullen, objectional lateral jitter has been eliminated and the screen-like pattern greatly reduced. Laboratory demonstrations during the past six months have indicated horizontal jitter, a perceptible diagonal pattern, flicker and ghosts.

## Du Mont Developing 3-D Color TV

Allen B. Du Mont Labs., Inc. is developing a compatible 3-dimensional color TV system, Dr. Allen B. Du Mont, president, told stock holders recently. He also intimated that this system may be demonstrated by the end of this year. Dr. Du Mont emphasized that his company was not preparing to put this system forward at this time, but he demonstrated optimism over the possibility of early successful developments. TV pictures from such a compatible system could be received in four different ways. They are: 1—In black and white; 2—In color; 3—In 3-dimensional color; 4—In 3-dimensional black and white.

Dr. Du Mont estimated that 3-D black and white receivers would cost less than color receivers. He placed the retail cost of a 17 in. color receiver at between \$500 and \$700.

## RCA TV for Japan

Three TV stations, equipped with RCA 10-kw transmitters and associated studio and remote equipment, are being prepared for commercial operation in Tokyo, reports Meade Brunet, Vice President and Managing Director of the RCA International Div. The stations, using U.S. 525-line standards, will serve some 12 million people. Until mass production can be achieved by the Japanese, a substantial number of American-made receivers will be shipped to Japan. For more information on Japanese TV, see Feb. 1952 TELE-TECH & ELECTRONIC INDUSTRIES, page 57.



# FLAT PRESS HEATER-CATHODE TUBE NEWS

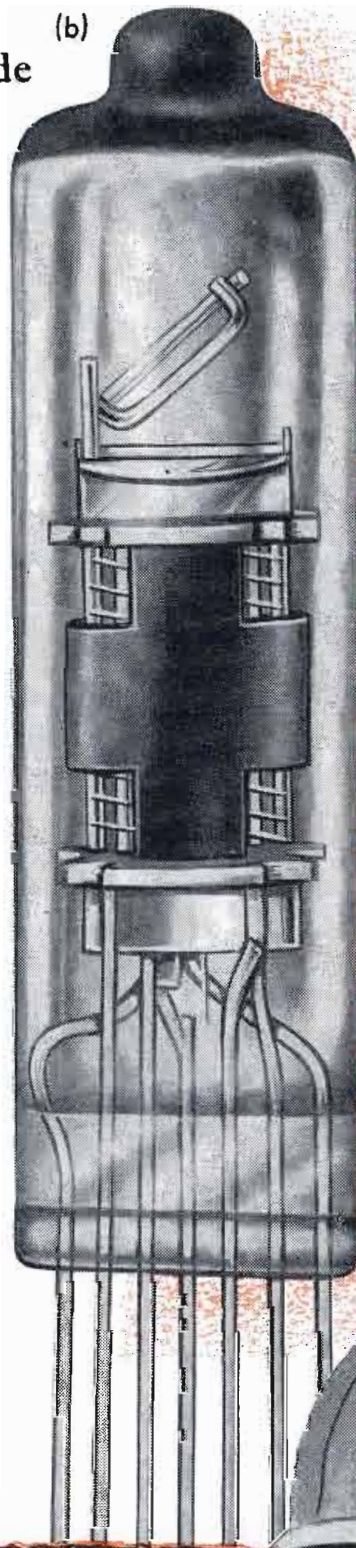


**EXTRA**

**EXTRA**

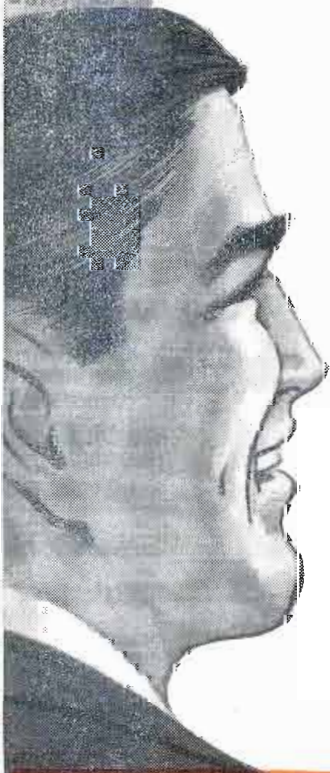
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1. Higher Plate Voltage Ratings
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6. Lower Vibrational Noise Output
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8. Reduced Air Leakers — Longer Dumet Seal (a)
9. Molded Tips (b)



TUBE SHOWN IS RAYTHEON CK5702WA ENLARGED 4 TIMES

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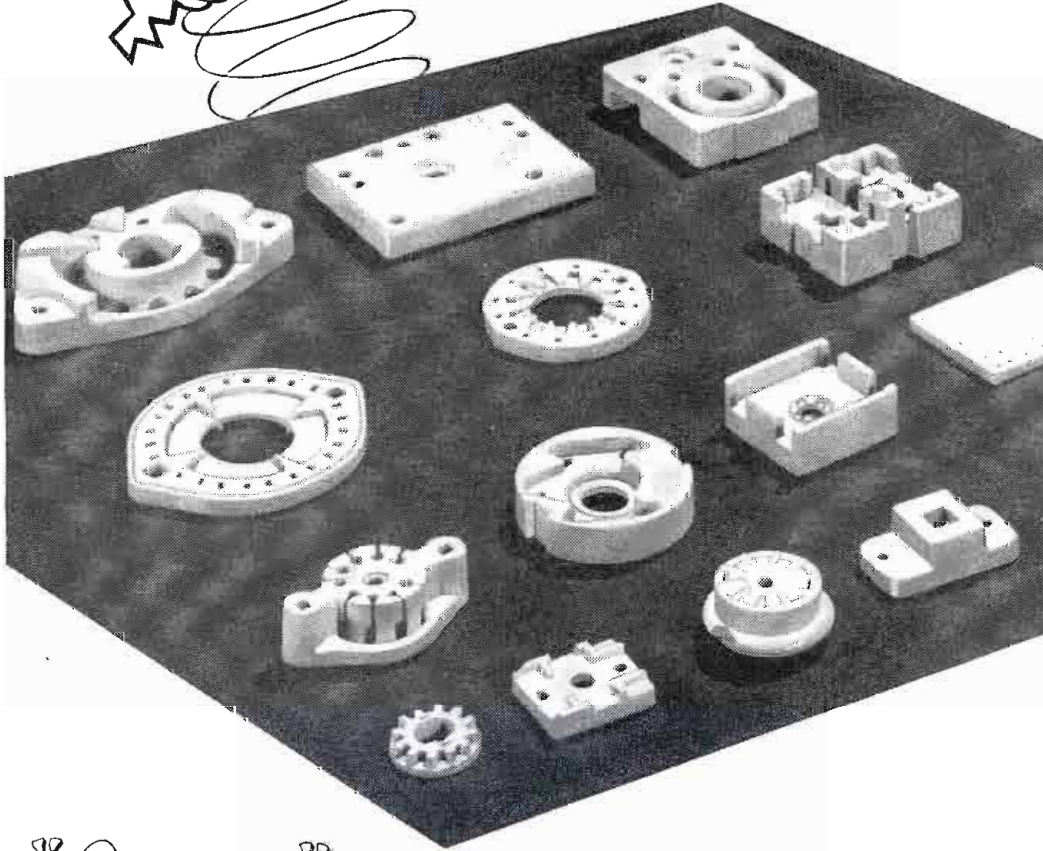
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### **D. M. STEWARD MANUFACTURING CO.**

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## **Low-Noise Amplifier**

*(Continued from page 107)*

by the inefficient but simple means of a damping resistor in series with the output terminal. The insertion amplifier is shown in Figs. 2 and 3.

Computations show that the source impedance for optimum noise figure should be about 250 ohms. The purpose of the quarter-wave section of RG-62/U is to transform the 50 ohm generator impedance to something closer to this optimum. With this arrangement, and with a  $g_m$  of approximately 30,000 micromhos, a calculated noise figure of 2.3 db is deduced. A measured noise figure of 2.5 db, with a gain of about 10 db and a bandwidth of 90 mc, is obtained at 225 mc. It should be noted that with unity input impedance transformation, that is, with the cathode excited directly from a 50 ohm source, the amplifier is close to a power match with the generator because the cathode input impedance is close to 50 ohms. The computed noise figure under this condition is 4.4 db, but measured noise figures have not exceeded about 3.0 db.

In addition to its use as an insertion amplifier, the 416A has been incorporated into a tuner for the 227-mc PPM-AM telemetering receiver. As is shown in the circuit diagram in Fig. 4, the tube is again used as a grounded-grid r-f amplifier, a triode-connected 6AK5 serves as a mixer, and a 6C4 as a local oscillator. When used in conjunction with a 30-mc i-f amplifier having a  $\frac{1}{2}$ -mc bandwidth and 3 db noise figure, the tuner yields an overall receiver noise figure of 3 to 3.5 db at 227 mc. The r-f bandpass of the tuner is approximately 6 mc as determined by the inductive coupling between r-f amplifier and mixer. A lower overall noise figure of about 2.5 db has been achieved by using two r-f amplifiers in cascade, but it is felt that the small increase in sensitivity is hardly worth the price of the additional tube. The tuner, with quarter-wave-line input transformer is shown in Figs. 5 and 6.

The amplifiers and tuners described above have been successfully used in several upper-atmosphere sounding-rocket experiments at White Sands, N. M., where they are components of the Naval Research Lab.'s 15 channel, 312 sample-per-second PPM-AM telemetering system. An increase in range and sensitivity that more than compensates for the expense of the 416A triode is afforded by the use of these low noise units. In fact, it has been found that the sensitivity is often limited



not by receiver noise, but by man-made noises originating in nearby high tension lines, power transformers, and electrical machinery—factors which do not affect conventional receivers in the area. It therefore appears that there is a practical limit to continued reductions in noise figure, particularly in view of the existence of an irreducible minimum of noise of galactic and solar origins over the band. Further reduction of noise figure is considered unprofitable in the present application.

#### REFERENCES

1. J. A. Morton and R. M. Ryder, "New Triode for 4000 mc Operation," *Tele-Tech*, p. 32 et seq., April, 1949.
2. Lowell, R., "A Low-Noise Wide-Band 200-mc Insertion Amplifier," Naval Research Lab. Report No. 3979, May 16, 1952.
3. Best, N. R., Lowell, R., Mazur, D. G., and Uglow, K. M., "Upper Atmosphere Report No. XVI, The AN/DKT-7(0) 15-channel PPM Telemetering Transmitter," NRL Report No. 4016.
4. Bowen, A. E. and Mumford, W. W., "A New Microwave Triode; Its Performance as a Modulator and as an Amplifier," *Bell Sys. Tech. Jour.*, 29:531-532, Oct. 1950.
5. Robertson, S. D., "Electronic Admittances of Parallel-Plane Electron Tubes at 4000 Megacycles," *Bell Sys. Tech. Jour.* 29:496-530 Oct. 1950.

### AIEE Midsummer Meet

The program for the 1953 AIEE Midsummer Convention at Atlantic City's Chalfonte-Haddon Hall Hotel features a number of interesting technical papers on TV and broadcasting. In addition, Major E. H. Armstrong and R. D. Darrell will discuss binaural broadcasting, and C. J. LeBel will discuss magnetic recording. During the Convention there will be an inspection trip to UHF station WFPG-TV.

Listed below are the technical papers being presented at the Television, Binaural Broadcasting and Magnetic Recording Sessions on June 16th and 17th:

#### TELEVISION

(June 16, 1953—morning)

- T. C. Sayer (DuMont), "A UHF Transmitter Employing a Klystron Power Amplifier."  
 E. M. Bradburd (Federal), "Technical Characteristics of FTL Type 20-B UHF Television Transmitter."  
 E. A. Laport and C. W. Slaybaugh (RCA International), "Review of Television Abroad."  
 A. J. Forman (Tele-Tech & Electronic Industries), "Engineering Plans for Theatre Television."  
 R. Dressler (Chromatic Television), "The Chromatron, a Single or Multigun Tricolor Cathode-Ray Tube."

#### Binaural Broadcasting

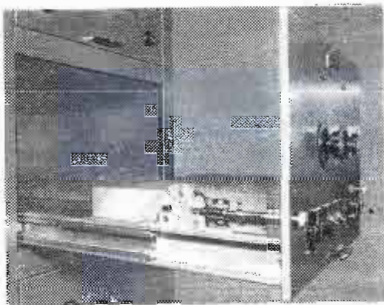
(June 16, 1953—afternoon)

- M. G. Crosby (Crosby Labs), "Binaural Transmission by FM Multiplex."  
 R. J. Tinkham (Ampex), "Stereophonic Recording Equipment."  
 H. T. Sherman (Sherman Studios), "Better Realism with Binaural Sound Reproduction."  
 E. Cook (Cook Labs.), "Engineering and Subjective Aspects of the Binaural Medium."

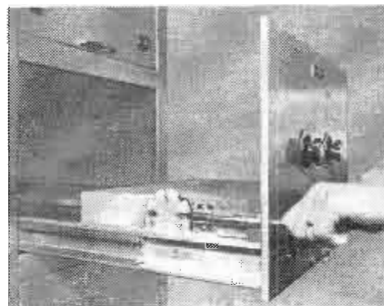
#### Magnetic Recording

(June 17, 1953—morning)

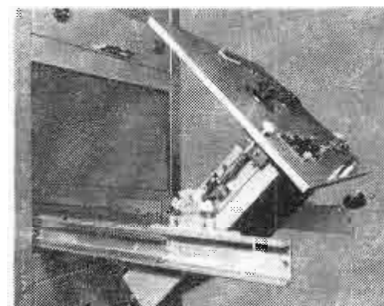
- R. E. Zenner (Armour), "Present Status of Magnetic Recording."  
 R. H. Ranger (Ranger-Tone), "Synchronized Magnetic Tape Recording."  
 L. L. Anderson and O. Kornei (Brush), "Structure and Performance of Magnetic Transducer Heads."  
 J. F. Jewett (Ferroxcube), "Performance Characteristics of Ferrite Recording Heads."



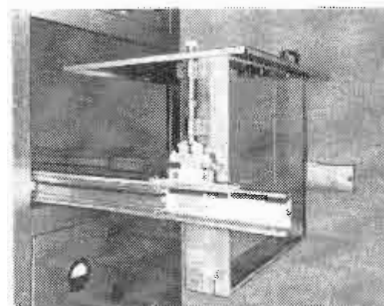
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2. PIVOT RELEASE — Withdrawing release rods disengages them from quadrant mechanism, enables perfectly balanced unit to be tilted by simply raising.



3. 45° PIVOT — Unit locks in 45 degree or 90 degree position. Special pivoted positions can be obtained to fit individual requirements.



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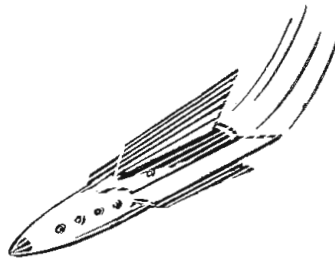


**MV-11A DC - micro-micro-ammeter, 10  $\mu$ A to 10 A.**

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THE FOLLOWING INSTRUMENTS ARE ORIGINAL MILLIVAC DESIGNS. THEY ARE WIDELY USED IN LEADING GOVERNMENT AND INDUSTRIAL LABORATORIES TODAY. OUR METERS ARE RECOGNIZED FOR UNUSUAL SENSITIVITY AND STABILITY AT MINIMUM CIRCUIT LOADING.



**MV-17B DC** high-impedance millivolt meter (since 1948): Sensitivity 1 mV full-scale on lowest range (6 Megohms input impedance). Highest range 1,000 V, 60 Megohms.

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**MV-15A DC** micro-volt-meter (since 1950): Sensitivity 10  $\mu$ V full-scale (1,000 Ohms). Highest range 1 V.

**MV-73B** multi-meter (since 1947), AC, DC, RF-Volts, AC, DC-Amps, 6 Ohm ranges.

# MILLIVAC Instrument

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## Microwave Reflector

(Continued from page 99)  
0.45). The angle of rotation is 68°. Patterns obtained at X-band are shown in Fig. 6 where they are compared with patterns from a paraboloid of approximately equal f/D ratio. The torus is somewhat superior off-axis although its beamwidth is slightly broader. When the torus is scanned to a greater angle than shown here, the side lobe on the left ("coma" lobe) increases in intensity.

For longer f/D ratios the paraboloid and the parabolic torus become almost identical so that a point is reached at which there is little advantage in the use of the torus.

This type of parabolic torus can be used in applications where a scan somewhat better than a paraboloid is desired. One possible use occurs in marine-navigation radar. Here the vertical beamwidth of present systems is deliberately broadened so that a surface target is covered for any position of ship's roll. With a parabolic torus reflector, a narrow vertical beam, with resulting increase in system gain, could be used. The feed horn would be synchronized with the ship's motion so that it always assumed a position to hold the narrow beam on the surface target. Through use of the increased gain, such a system might trade electronic complexity for mechanical complexity and so be more acceptable to the average ship's engineer.

### Parabolic Torus Limitations

At the present time, after 18 months work, two fundamental limitations of the parabolic torus have been found. They are both traced to the fact that a perfect plane wave cannot be obtained.

The first of these concerns the beamwidth in the plane of scan. For beams narrower than 3°, the relationship between beamwidth and aperture size is no longer linear. There is a decrease in aperture efficiency as the beamwidth decreases. For this reason, it is considered impractical to obtain a beamwidth of the order of 1° in the plane of scan.

The second limitation involves the pattern structure. Energy at levels below about 15 db does not drop off rapidly as in the case of the paraboloid. This is not evident in the principal planes of the pattern as much as in other regions. This energy is at a low enough level that it does not greatly affect the gain

of the antenna, but it does give a broadening of the "base" of the beam which may be harmful in some applications.

#### REFERENCES

1. H. N. Chait, "A Microwave Schmidt System," *NRL Report 3989*.
2. G. D. M. Peeler and D. H. Archer, "A Two-Dimensional Microwave Luneberg Lens," *NRL Report 4115*.
3. K. S. Kelleher and H. P. Coleman, "Off-Axis Characteristics of the Paraboloid Reflector," *NRL Report 4088*.

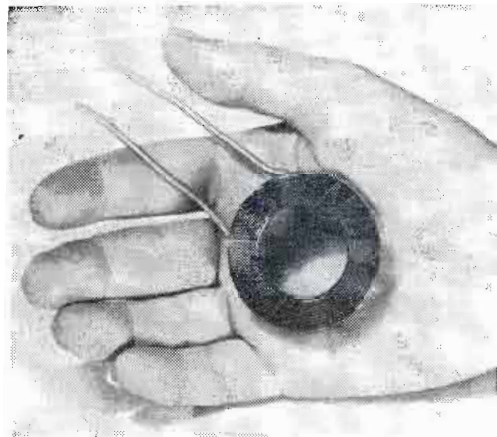
### Improved Tape Head

What is described as a major advance in magnetic recording is a new playback head developed at Armour Research Foundation of Illinois Institute of Technology. The head can be modified to make it record also.

Dr. David Wiegand, inventor of the device, reports that it incorporates magnetic amplifier action. The head's most important advantage is that it gives much stronger signals than those obtained from a conventional head under similar conditions. Also, response is independent of frequency, unlike ordinary heads in which signal strength increases with frequency. These advantages make it possible to use simpler playback equipment than has been practical up to now. It is expected to find use in low-cost playback-only machines when recorded tapes become more readily available for home entertainment.

With conventional heads, tape must be run through in playback at a certain speed or the signal strength falls off. With the new head, however, signals remain strong no matter how slowly the tape is run through. For measurement uses, signals can be recorded at a high tape speed to collect data on events that are occurring very rapidly, and then the tape can be played back slowly enough for the data to be studied in detail.

### POLYESTER FILM FOR INSULATING APPLICATIONS



Solenoid coil wrapped in "Mylar" polyester film is typical insulating application for Du Pont's high tensile strength (25,000 lbs./sq. in.) material. It can be made as thin as 0.00025 in. and is also used in capacitors. Now being produced experimentally, "Mylar" will be in mass production by 1955 at a plant being constructed in Circleville, Ohio

FOR QUICK STARTS WITHOUT

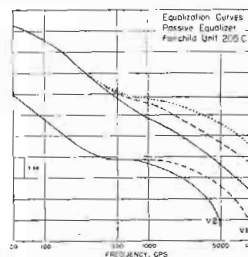
# Overshoot

NEW 3-SPEED TURNTABLE PROVIDES  
GUARANTEED TIMING FOR "DUBBING"  
AND ON-THE-AIR BROADCASTING

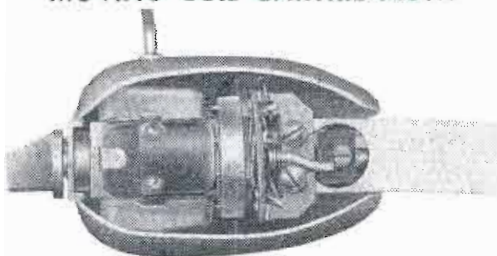


Reaching *stable speed*—less than  $\frac{1}{2}$  revolution at  $33\frac{1}{3}$ —in minimum time, this newly designed turntable provides quick start from motor switch without overshooting. Successor to the 2-speed model 524, the Fairchild 530 is equipped with integral 3-speed drive, all three speeds synchronous. Ideal for "dubbing" operations, on-the-air broadcasting and laboratory applications, the 530 provides guaranteed accurate timing at all speeds, is virtually free of rumble and vibration. More than 300 already in use!

*Accurate Equalization* WITH THE FAIRCHILD 205. As demonstrated by chart at right, this unit provides matching equalization curves for various types of lateral and vertical records and transcriptions, in accordance with NAB standards.



*One* TURRET HEAD HOLDS *Three* MOVING COIL CARTRIDGES...



The simplicity of this 3-in-1 Turret Head obsoletes multiple arms, equalizers and throwover switch. Use only *one* Fairchild Turret Head Arm, it mounts up to three Fairchild Miniature Moving Coil Cartridges at one time—ready for instant selection at the turn of a knob, which also sets correct stylus pressure. All critical adjustments, usually inherent in viscous damped arms, have been eliminated in the current Fairchild 201-B. A completely redesigned base assembly with a new method of pivoting now incorporates automatic temperature control.

*World's Finest  
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Fairchild Tape Recorders and Accessory Equipment are built to the highest professional standards and incorporate many exclusive features, including Pic-Sync, Syncroll Drive, Automatic Framing Control and others. Fairchild Tape Recorders are also built to order for specialized applications.

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ADA 95D**

**THE FIRST SLENDER DYNAMIC  
AT A POPULAR LOW PRICE . . .**

Sleek and slender as a modern space rocket . . . graceful lines artfully blended . . . high quality performance . . . new low cost . . . the most exciting advance in the microphone field . . . The *new* TURNER ADA 95D!

The excellent sound characteristics of this new jet-shaped dynamic make it ideal for high quality P.A. and recording work . . . its slim, inconspicuous shape lets speakers be seen as well as heard. Maximum sensitivity to voice and music with Alnico V magnets and moving coils; frequency response, 70 to 10,000 cps; output level, —58 db; standard 5/8"—27 coupler swings microphone in 60° arc; satin-chrome finish; 20 ft. removable cable set; choice of 50, 200, 500 ohms or high impedance.

Switch models also available.

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**CR Sweep System**

(Continued from page 110)

driver tube draws 100 ma cathode current from a 250 volt B supply to produce full sweep and high voltage. The peak plate voltage surge on the driver tube is only 4300 volts under the above conditions.

**Wide Angle Picture Tube**

The 27 in. picture tube and the yoke in the subject system were developed together to a degree unprecedented in the move from 50° to 70° sweep. Aluminization of large-screen tubes was found to be desirable. Concepts of screen curvature and rectangular shape were established based on tests of the GE 30AP4 metal-cone picture tube; proposals for the 27 in. screen were proportioned to this curvature. A plaster cast was developed to examine the appearance of the face plate proposal.

It was decided to define the 90° picture tube class exactly, by the limit, rather than the bogie case. Thus, 90° tubes will require, for complete fill of all front-visible screen (with complete absence of "neck shadows" in all screen corners), no more angular excursion of the cathode ray beam, than swept to the full diagonal of a hypothetical "limit tube" using a "customer limit yoke."

The limit picture tube postulates the simultaneous occurrence of all tube variations at the most adverse blend relative to sweep. The bulb assembly so defined has minimum face plate crest to "reference line" span, maximum screen diagonal visible from all frontal approach, and maximum glass flare-wall thickness in the yoke reference line region.

With a limit bulb assembly as defined above, the center line of the cathode ray beam is still one tenth of an inch from the glass wall when the beam is swept through a 90° arc to the screen diagonal by the "customer limit yoke."

**Limit Yoke**

The limit yoke is one in which the coils are identical with the receiver type coils used in the production sets, but the effective center of deflection is displaced toward the rear of the yoke (nearer to the picture tube base). This displacement is secured by shortening the ferrite core enclosing the active coil edges, cutting a thin ring off the front edge of the core, leaving the balance of the core in its original location.

Calibration of the tube and yoke

limits is secured by tests of production design yokes on a calibrated picture tube, the cone of which is shortened to require beam sweep of approximately 95% to reach the corners. The internal as well as external dimensions of the bulb were noted before assembly, permitting screen calibration.

The 27 in. tube screen magnifies the neck restrictions approximately 20 diameters so that the neck region is extremely critical. It was desired to keep the glass close to the maximum beam trajectory yet retain standard neck diameter.

Two standard flare shapes have been manufactured to conform to JETEC tube gages defining the glass contour in the neck flare region. The first of these is the pressed glass funnel spliced to the metal cone of metal cone tubes or used in respliced all glass bulbs. The second, somewhat thicker flare is the spun neck, cast centrifugally by spinning the glass mold, then immediately "tooled" before the molten glass congeals, to remove excess glass from the funnel throat by moving roller. Present processing needs during bulb manufacture require the differential in wall thickness mentioned. This thickness factor requires a considerable difference in approach to the design of yokes optimized for use with each neck. A yoke optimized in field distribution for the thinner wall pressed funnel may produce fringes of neck shadow in the screen corners if this yoke is used with spun all-glass funnels, which tend to produce more interference with the beam.

On the other hand a yoke suited to the needs of an all-glass spun funnel will present even greater freedom from neck shadow on a metal-glass tube, and greatly expedite the alignment of components on tube neck. The apparent center of deflection, in the spun neck case, must be located further forward, toward the screen.

The condition chosen, therefore, for the subject system was to satisfy the more critical needs of the all-glass picture tube with a spun neck. A safety factor has been provided to allow for even more interference than by the limit tube to simplify focus coil and ion trap magnet adjustment.

#### **Flared Yoke**

It was desired to utilize 70° sweep driver tubes and circuitry where possible with the 90° class of tubes, so that economy of power intake for increased magnetic effect was the  
(Continued on page 172)

to the

## **ELECTRICAL ENGINEER**

OR

## **PHYSICIST**

with experience in

## **RADAR**

OR

## **ELECTRONICS**

*Hughes Research and Development Laboratories, one of the nation's leading electronics organizations, are now creating a number of new openings in an important phase of their operations.*

*Here is what one of these positions offers you:*

#### **THE COMPANY**

Hughes Research and Development Laboratories, located in Southern California, are presently engaged in the development and production of advanced radar systems, electronic computers and guided missiles.

#### **THE NEW OPENINGS**

The positions are for men who will serve as technical advisors to government agencies and companies purchasing Hughes equipment—also as technical consultants with engineers of other companies working on associated equipment. Your specific job would be essentially to help insure successful operation of Hughes equipment in the field.

#### **THE TRAINING**

On joining our organization, you will work in the Laboratories for several months to become thoroughly familiar with the equipment which you will later help users to understand and properly employ. If you have already had radar or electronics experience, you will find this knowledge helpful in your new work.

#### **WHERE YOU WORK**

After your period of training—at full pay—you may (1) remain with the Laboratories in Southern California in an instructive or administrative capacity, (2) become the Hughes representative at a company where our equipment is being installed, or (3) be the

Hughes representative at a military base in this country or overseas (single men only). Compensation is made for traveling and moving household effects, and married men keep their families with them at all times.

#### **YOUR FUTURE**

In one of these positions you will gain all-around experience that will increase your value to our organization as it further expands in the field of electronics. The next few years are certain to see large-scale commercial employment of electronic systems. Your training in and familiarity with the most advanced electronic techniques now will qualify you for even more important future positions.

*How to apply:*

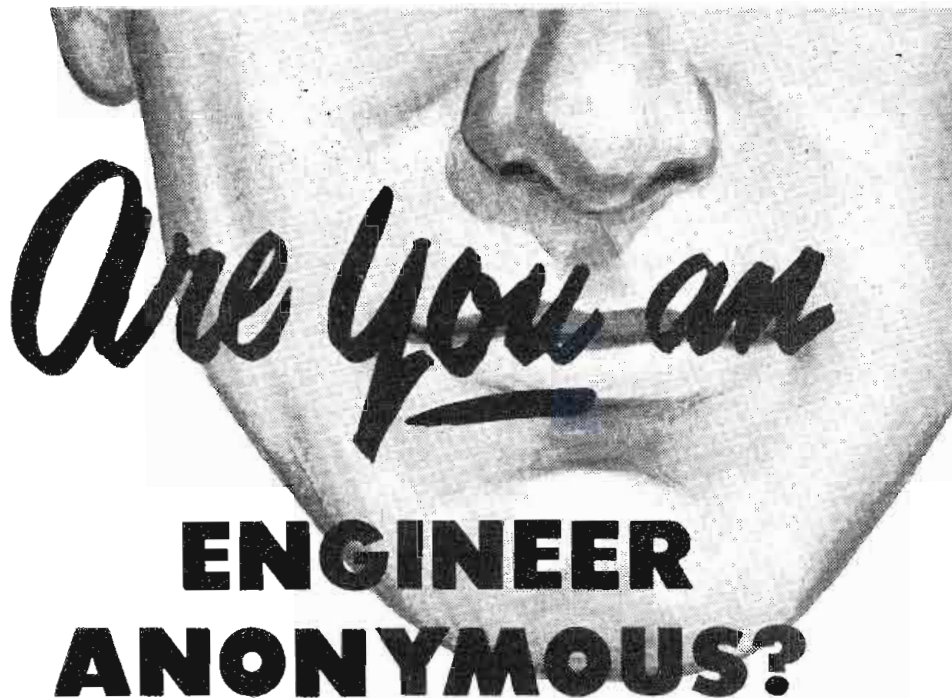
## **HUGHES**

### **RESEARCH AND DEVELOPMENT LABORATORIES**

*Scientific and Engineering Staff  
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*If you are under thirty-five years of age, and if you have an E.E. or Physics degree, write to the Laboratories, giving resumé of your experience.*

*Assurance is required that relocation of the applicant will not cause disruption of an urgent military project.*



An Engineer Anonymous is one of those capable men with good potential... confined to routine assignments that offer little challenge or opportunity to move ahead.

There are no Engineers Anonymous at Magnavox!

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keynote, as well as preservation of focus quality on the larger screens.

These needs dictate the use of longer coils than employed in 70° sweep systems yet shape such coils to permit the effective center of deflection further forward toward the screen than before, with the increased sweep angle. The 70° GE yoke had been developed to retain straight-edged coils, but take full advantage of formerly wasted end space by interlocking the coil ends to allow bringing the center deflection forward from its 50° location with the same core and coil form developed for 50° sweep.

A new use of known principles was therefore needed to secure 90° sweep. Prior art discloses several possible coil shapes, generally of flared or tapered front, to effect a portion of the sweep action beyond the reference line, in the cone region of the tube. These coils must be larger and generally more difficult to wind than 70° coils due to this size, and the flared or bent shapes involved. The coils developed along these lines are compared in Fig. 4 with 50° and 70° coils.

The flared section of such coils is less effective in producing sweep than the cylindrical section on the tube neck, due to the increased air path for flux in the cone region. A balance must be struck between a large flare with its increased material and difficulty of winding and the diminishing returns of extending this section toward the screen. Approximately a third of the active length of the new yoke lies in the flare section (Fig. 4). Less than a fifth of the total sweep action takes place in the flared portion of the yoke, however, due to the flaring gap in the core.

**Insulation of Coils**

Insulation of the coils from each other was achieved by the retention of coplanar windings in the active edges, and spacing the ends apart where no pressure is exerted on or by the picture tube (See Fig. 5).

As in the GE 70° yokes of contemporary construction, the slightly shorter coil-pair is used to effect horizontal sweep; the longer coils provide vertical sweep. This orients any residual astigmatism in the yoke field to accent video detail along a line, yet leaves all lines separate and distinct.

Again, as in the GE 70° yokes, one of the horizontal sweep coils in each pair of yoke coils is wound in reverse direction to secure balanced transient response. A parallel connection of higher impedance coils is

employed to avoid the need for a "balancing" capacitor otherwise needed across the higher potential coil of a series connected pair which is operated with one external terminal of the yoke at ac ground potential.

As is true of the 70° yokes, the subject 90° design exhibits high magnetic efficiency, yet contains less than half of the copper conventionally used in each coil. Lower distributed capacitance results in and between vertical and horizontal windings.

#### Winding Methods

Early developmental yoke coils were wound flat, then folded and deformed to cylindrical shape. No housing was provided. Later, flared coils were hand wound to shape in brass blocks and baked to rigidity by fusing the thermoplastic overcoating on the wire. Wire sizes between 29 and 35 have been successfully wound.

Preservation of winding sequence is regarded as a prime objective to reduce voltage stresses between conductors in a coil edge or end. Random winding may result in well over a thousand peak volts existing between adjacent conductors. To this end, in hand winding, and in all successful machine winding operations, it has been found desirable to pack each conductor in the winding edges while winding. This secures consistently reliable coils suitable for horizontal sweep and high copper density in the available vertical winding space.

#### Coil Housings

The tough, yet pliable nylon housing is a distinctive feature of the yoke assembly—either low or high impedance windings are separated from each other and protected against handling and shipping hazards; the terminals are located in front away from the adjuster's working area at the rear of the yoke. Mounting for centering magnets may be provided on the rear cover of the yoke (Fig. 6).

Additional yoke sensitivity can always be obtained by eliminating the housing. It is felt that further increases in sensitivity of the horizontal coils would impair the regulation of the high voltage supply derived from stored sweep energy. Too efficient a coil is thus to be guarded against in the interest of overall economy in the combination sweep and high voltage unit.

By adopting the subject 90° sweep system and yoke the new 27 in. wide angle picture tubes may be utilized

(Continued on page 174)

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	Type Number	Input Voltage Nominal Excitation	Input Current Milliamperes	Input Power Watts	Input Impedance Ohms	Stator Output Voltages Line to Line	Rotor Resistance (DC) Ohms	Stator Resistance (DC) Ohms	Maximum Error Spread Minutes
Transmitters	AY201-1	26V, 400~, 1 ph.	225	1.25	25+j115	11.8	9.5	3.5	15
	AY201-4	26V, 400~, 1 ph.	100	0.45	45+j225	11.8	16.0	6.7	20
Receivers	AY201-2	26V, 400~, 1 ph.	100	0.45	45+j225	11.8	16.0	6.7	45
Control Transformers	AY201-3	From Trans. Autosyn	Dependent Upon Circuit Design				42.0	10.8	15
	AY201-5	From Trans. Autosyn	Dependent Upon Circuit Design				250.0	63.0	15
Resolvers	AY221-3	26V, 400~, 1 ph.	60	0.35	108+j425	11.8	53.0	12.5	20
	AY241-5	1V, 30~, 1 ph.	3.7	—	240+j130	0.34	239.0	180.0	40
Differentials	AY231-3	From Trans. Autosyn	Dependent Upon Circuit Design				14.0	10.8	20

\*\*Also includes High Frequency Resolvers designed for use up to 100KC (AY251-24)

**AY-500 (PYGMY) SERIES**

Transmitters	AY503-4	26V, 400~, 1 ph.	235	2.2	45+j100	11.8	25.0	10.5	24
Receivers	AY503-2	26V, 400~, 1 ph.	235	2.2	45+j100	11.8	23.0	10.5	90
Control Transformers	AY503-3	From Trans. Autosyn	Dependent Upon Circuit Design				170.0	45.0	24
	AY503-5	From Trans. Autosyn	Dependent Upon Circuit Design				550.0	188.0	30
Resolvers	AY523-3	26V, 400~, 1 ph.	45	0.5	290+j490	11.8	210.0	42.0	30
	AY543-5	26V, 400~, 1 ph.	9	0.1	900+j2200	11.8	560.0	165.0	30
Differentials	AY533-3	From Trans. Autosyn	Dependent Upon Circuit Design				45.0	93.0	30

For detailed information, write to Dept. H.

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with many receivers originally developed for smaller, narrow angle picture tubes. The original driver tubes might be retained in most cases, with appropriate matching transformers, even though the power supply is limited to 250 volts.

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**Bell System Adding 13,000 Channel Miles**

A survey by the Long Lines Dept. of AT&T shows that the 916 mi. of TV channels serving 12 stations five years ago have now been extended to some 34,000 channel miles, enabling more than 130 stations in 87 cities to receive "live" network television programs. And, according to A. F. Jacobson, Long Lines Director of Operations, another 13,000 channel miles will be added to the system between now and the end of the year.

In addition to regular TV broadcasting, these facilities are also used to provide theaters and other locations with telecasts of entertainment. Since 1948, theaters have been linked for TV service on 117 occasions.

With most of the present equipment, each pair of coaxial tubes is capable of carrying 600 telephone conversations or one TV program in each direction. A system recently developed will enable each pair of coaxials to carry 600 telephone conversations and one TV program in each direction; or as many as 1,800 telephone conversations. When fully developed, a microwave relay system has a capacity of 12 channels, six in each direction.

These were some of the major milestones in the rapid growth of network television since May 1, 1948:

The national political conventions were telecast to 18 stations in nine eastern cities.

The east and midwest networks were linked in Jan. 1949.

Coast-to-coast TV was inaugurated in September, 1951.

Telecast of political conventions in July of 1952 to 107 stations in 65 cities.

In Sept., 1952, 50 theaters in 30 cities were linked on a closed circuit for the Walcott-Marciano heavyweight title fight. It is estimated that 125,000 persons witnessed the match.

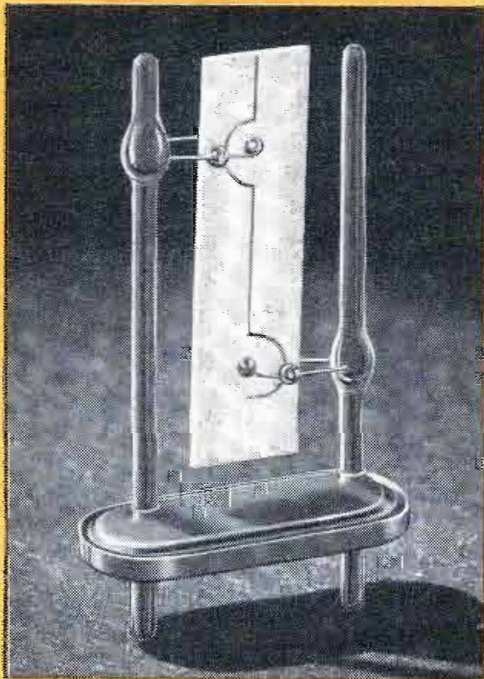
First coast-to-coast telecast of election return programs, Nov., 1952, transmitted "live" to 110 stations in 67 cities.

Jan., 1953, another first—coast-to-coast telecast of the Presidential Inaugural ceremonies.



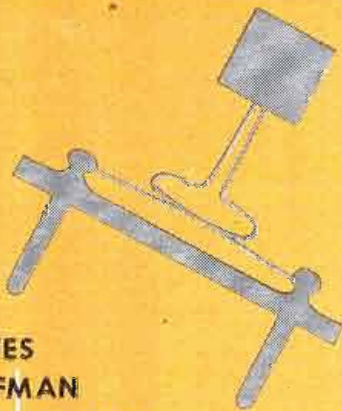
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TYPE	APPLICATION	PRI. IMP.	SEC. IMP.
UM-110	Interstage	20,000	1,000
UM-111	Output or matching	1,000	60
UM-112	High imp. mic. to emitter	200,000	1,000

Other transistor transformers, built to your special requirements, are available for original equipment production only. Write for Bulletin 462.

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TT-12	Mic., pickup or line to push-pull grids.	50, 200/250, 500/600	50,000
TT-13	Dynamic mic., to single grid.	7.5/30	50,000
TT-14	Single plate to single grid.	15,000	60,000

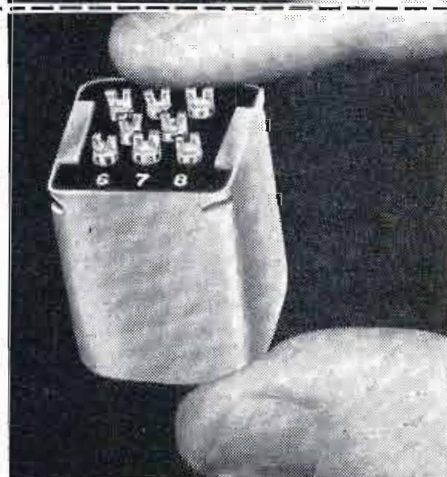
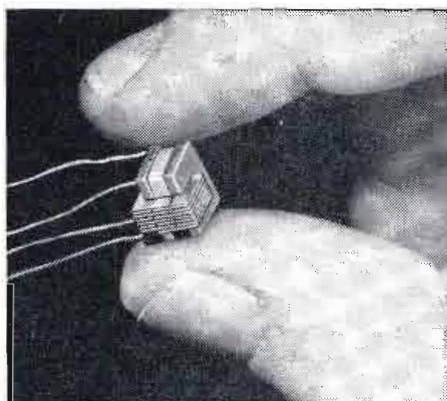
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## Magnetic Amplifiers

(Continued from page 115)

(demodulation) and its distortion is determined by the linearity of the response characteristic. The application of negative feedback (Fig. 11) allows the reduction of signal distortion to any degree desired.

Reactor sizes are comparable with transformers for the same rated maximum output. The core has to absorb the applied voltage according to Eq. 6 and the winding has to carry the maximum current. As with transformers, the ratio of watts per pound becomes better for high power amplifiers. Diagrams for re-

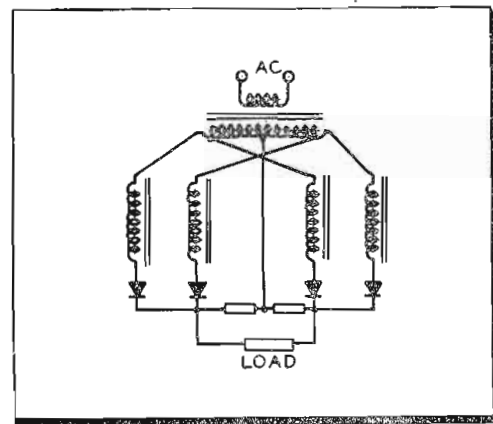


Fig. 19: Push-pull circuit, self-saturation

actor weights at different power outputs with power frequencies and core materials as parameters, are presented in the literature.<sup>11</sup>

Magnetic amplifiers compare unfavorably in weight with vacuum tubes or transistors for the same rated output. In comparing total equipment including the power supply, however, a lower weight has been reported. If the magnetic amplifier operates directly from an ac line and the electronic amplifier requires an additional dc power supply, the magnetic amplifier may be substantially lighter.

Rectifiers, if used, limit the application of magnetic amplifiers in various respects. The power limitations at medium and high frequencies were already brought out. Rectifiers also limit the operating temperature of magnetic amplifiers. Metallic core materials could theoretically be operated almost up to the Curie temperatures which are between 400 and 900°C. Dry disc and crystal diodes limit the magnetic amplifier to approximately 100°C and 80°C, respectively. Compromises could be made by using electronic diodes, sacrificing some advantages but gaining a higher operating temperature.

The quality requirements on the

rectifiers are high. Leakage currents, in particular, reduce the gain of self-saturating amplifiers substantially. Efforts are being made to improve rectifiers with respect to the limiting characteristics.

Like the transistor, the magnetic amplifier has longer life and greater dependability than the vacuum tube. Transistors are limited in power output and rather instable, particularly at dc. These few considerations and those outlined for the magnetic

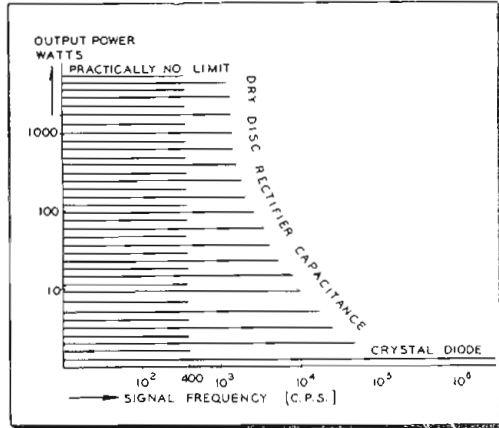


Fig. 20: Field of application for magnetic amplifiers is limited by rectifier employed

amplifier give some indications where to substitute magnetic amplifiers or transistors for vacuum tubes. Magnetic amplifiers are advantageous at dc and low frequencies while transistors appear more practical at audio and radio frequencies. Unfortunately, both are restricted at present as to the maximum operating temperatures. The magnetic amplifier, however, using selenium rectifiers, has a slightly higher operating temperature. Much higher operating temperatures can be achieved if no rectifiers are required.

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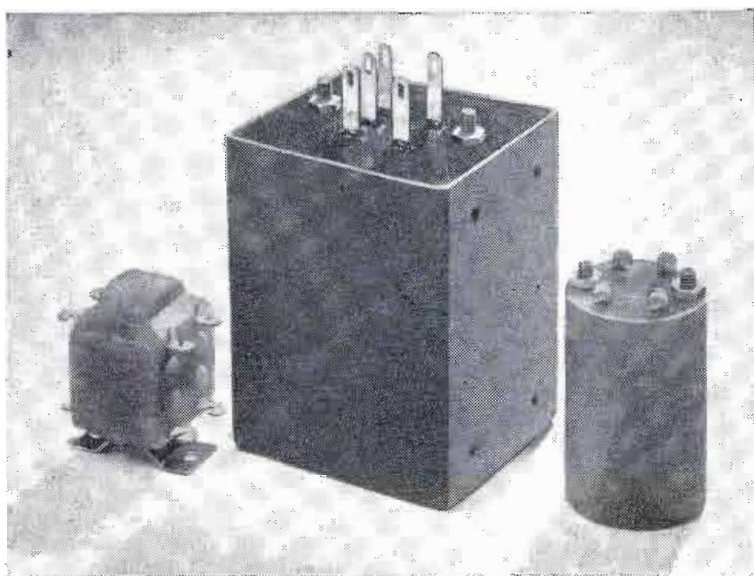
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#### **Transistors & Magnetic Amplifiers Integrated**

A new development which employs transistors in the sensitive preamplifier stages, with magnetic amplifiers serving as power output stages, is reported by the Selenium-Intelin Div., Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N.J. This unit permits detection and amplification of ac signals as low as  $10^{-11}$  watt. Other magnetic amplifier types control output powers as high as 20 kw. These high gain systems feature excellent stability, accuracy and economy of operation.

#### **National Moldite Expands Line**

National Moldite Co. has added ferrite cores to its regular line of magnetic iron cores and molded coil forms through the acquisition of Ferricore, Inc., of Yonkers, N. Y. In announcing the purchase of Ferricore, Sidney Lowenburg, president of Moldite, said that the arrangement was made as part of an expansion program to round out the regular Moldite line of precision electronic components.

#### **Production Starts in New IRC Plant**

The International Resistance Company, Philadelphia, has moved a portion of its production facilities to a recently built, modern plant situated on a 66-acre site in Asheville, N. C. Production is already underway, in the spacious \$200,000 plant, of the various types of volume controls used in radios, television sets, phonographs, testing equipment, military equipment and numerous other devices. Operating at full strength, the plant will employ approximately 500 persons of which the majority will be women. H. J. McCaully, formerly assistant to IRC's executive vice-president, will manage the Asheville plant.

#### **KGUL-TV and WHP-TV Connected to Bell Network**

The Long Lines Department of the American Telephone and Telegraph Co. has announced that stations KGUL-TV, Galveston, Tex. and WHP-TV, Harrisburg, Pa. have been connected to the Bell Telephone System's nationwide television network facilities. Network programs to KGUL-TV are being fed from Houston over a new microwave link to the station's transmitter at Alta Loma, 18 miles northwest of Galveston. Network programs to Harrisburg are also made available over a new microwave installation. This link connects WHP-TV to a section of the Bell System's network of TV facilities between New York and Pittsburgh. The two stations are the first to be constructed in their respective cities. With their connection to the Bell System facilities, network programs are now available to 130 stations in 85 cities in the United States.

## CR Tube Contrast

(Continued from page 102)

lows that the field minus the spot must have halation rings also, but they must be *negative*. This is shown in Fig. 5.

The same things happens with a line. Knowing that a bright line on a dark field generates halation lines, it follows that a dark line on a bright field must have faintly dark "negative" halation lines.

Now consider the edge flare of a bright field. Fig. 4, Sketch D. If the bright field is put on the right instead of the left, the edge flare shape must be exactly the same. Furthermore, if the two bright field edges are butted together, a perfectly uniform field must necessarily be obtained. Thus, it may be deduced that the shape of the edge flare is symmetrical about the field edge; that is, the top and bottom parts of the curve have exactly the same shape. They must fit perfectly. This deduction is another important key to an understanding of contrast anatomy.

So far, only simplified, exaggerated plots of contrast anatomy have been presented. Fig. 6 is taken from typical experimental data, and hence the effect of high-order halation and normal reflection is now present. Both pairs of curves come from exactly the same data, but one plot is linear and the other is logarithmic. In the linear plots, note their symmetry. The logarithmic curves show roughly how edge flare appears visually, since the eye sees in a logarithmic fashion. As expected, the brightness drops abruptly and then tapers off slowly on a sort of plateau, reaches another plateau, and starts to drop off again. The reason is not hard to discover. The second plateau is caused by light coming from second-order halation rings which extend out to 3.6S. If the plot were carried further, this staircase effect would be seen every 1.8S.

In some measuring instruments, absolute accuracy is not good on the high brightness range. However, since the curves *must* be symmetrical, the bright part may be plotted in all confidence when the more easily measured dark part is known.

The advantages of the lower transmission faceplate may be readily appreciated from Fig. 6. By changing from a clear faceplate to the grey faceplate, the small-area or Detail Contrast has been increased from 10:1 to 100:1, a factor of 10. The loss in light is only 28%.

Note that the faceplate need not be neutral. If a P1 were used, then the faceplate could be greenish, with  
(Continued on page 180)

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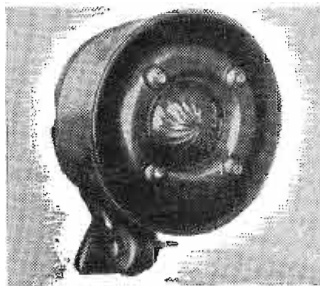
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**TRUMPETS** Model 7102 exemplifies the rugged construction and progressive engineering behind every University product. Model 7102 is the *only* loudspeaker ever approved by Underwriters' Labs for Class II Groups E, F, & G hazardous area duty. Features include re-entrant trumpet (pioneered by University) for compactness and greater efficiency, heavy duty 25 watt driver unit with exclusive University "W" shaped Alnico V magnet, and *built-in* line matching transformer with impedances of 16, 45, 500, 1000, 1500, and 2000 ohms. See general catalog for trumpets of all sizes.

**BREAKDOWN-PROOF DRIVER UNITS** Model PA-30 embodies features developed by University and never successfully imitated. Ratings are conservative, and construction is to well known University standards which have made our drivers famous for their dependable performance. PA-30 is rated at 30 watts, with response 80-10,000 cps, and is the **FIRST** to have a multi-tap built-in line matching transformer. Exclusive "rim centering" construction of mechanism and use of University "W" shaped Alnico V magnet insures high conversion efficiency, permanent voice coil alignment regardless of shock or vibrations. Weatherproofed throughout.

**PAGING AND INTERCOM SPEAKERS** These feature reflex air columns with hermetically sealed driver units. They are widely used for intercommunication and paging of all types. Efficiency is high and reproduction exceptional at any volume level. Directional, radial, or bi-directional types available. Weather-proof finishes permit use anywhere. Typical of University pace-setting design is the Cobra-12 illustrated, which provides optimum area coverage with minimum power input. Power rating is 12 watts, frequency response 250-10,000 cps, dispersion angle 60° x 120°. Swivel mounting bracket provides full flexibility.

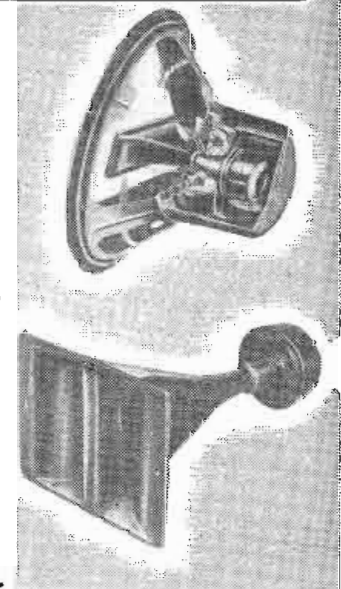


**SUBMERGENCE-PROOF SPEAKERS** These types are designed for use where extreme ruggedness and immunity to spray, gases, live steam or dust are essential. Function even under water, drain automatically, operate continuously regardless of exposure. Models available for directional or radial projection, wall or bulkhead mounting, swivel mount and with or without built-in line matching transformer and attenuator. Design is ideal for railroad use, shipboard, industries, docks, rough mobile work, etc. Model MM-2, illustrated, is rated at 15 watts continuous IPM, frequency 300-6000 cps, impedance 16 ohms.

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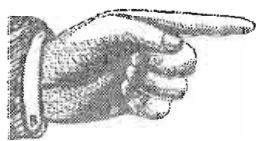
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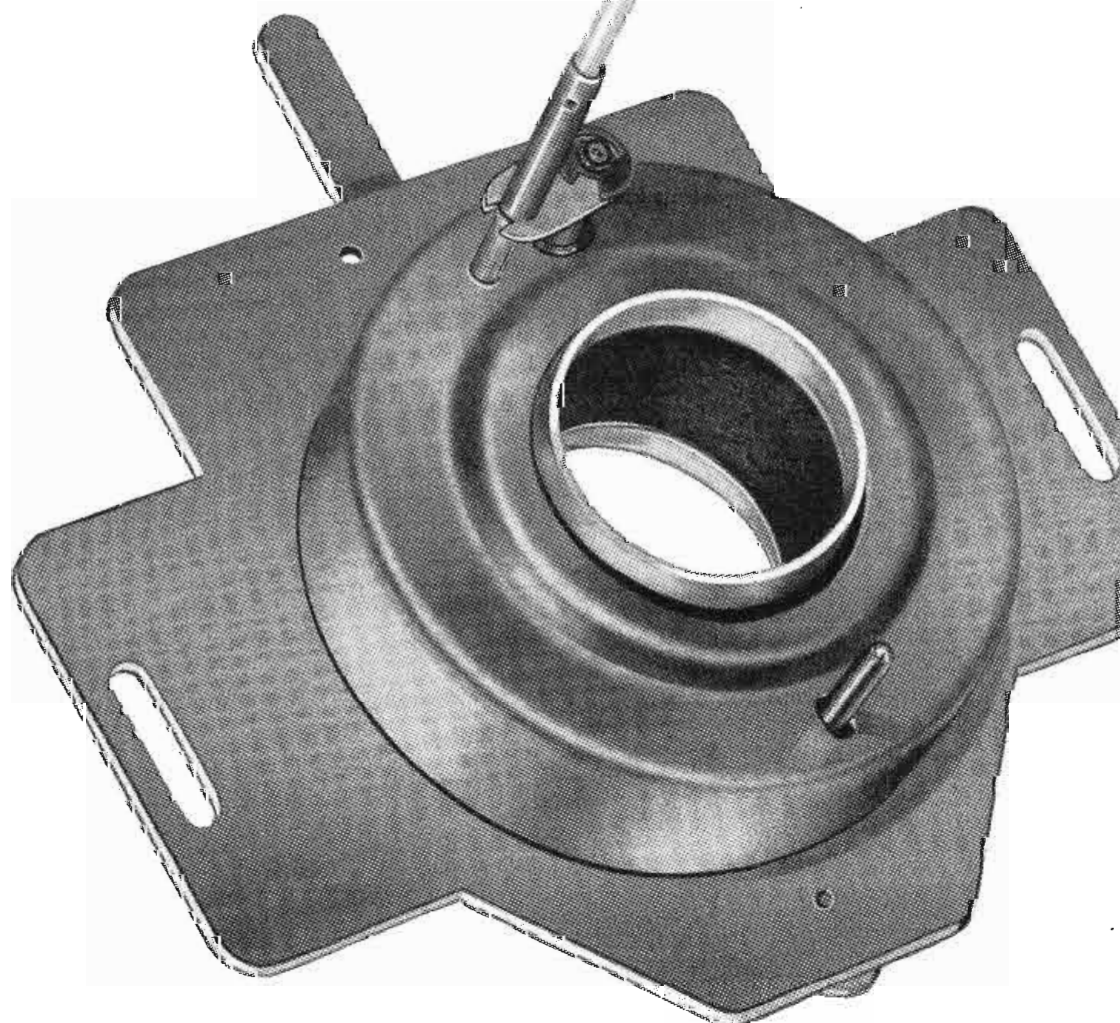
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the desired transmission in the green region and low transmission elsewhere so as to reduce the contrast degradation from ambient light. It can be shown that the density need not be uniform throughout the faceplate, but may be a thin coating on the glass-to-air interface.

The CRT measured in Fig. 6 is a 7½-inch diameter tube specially designed for flying-spot scanner application. It employs a 66% transmission ¼-in. faceplate. The maximum scanned area is 4.2 x 5.6 in., or a height of 16.8s.

## Edge Flare

A typical manifestation of edge flare occurs in flying spot scanners. Suppose that into an otherwise perfect flying spot scanner is introduced a pattern which produces the edge flare situation. The output voltage waveform will thus be the same shape as in Fig. 6B. In other words, the faceplate of the flying-spot tube has a sort of transient response. The usual 10% to 90% rise time is immediate in both cases, but as the rise time limits are made more stringent, the situation changes vastly. In the grey-faced tube, the 1% to 99% rise time is still instantaneous, but in the clear-face tube, the 1% to 99% rise time takes about four faceplate thicknesses. This is ½ the width of the faceplate of the CRT employed. Looking at it another way, this means that the grey faceplate allows a 100:1 small-area contrast range, while the clear faceplate allows only a 10:1 range.

Obviously, if a TV signal is desired which can produce a linear transfer characteristic over a 100:1 range in both large and small area, then the signal generating source must have at least that range for small area contrast.

The question naturally arises as to how one's own personal definition of "small area contrast" is related to the "Detail Contrast" condition previously defined. This question may be inferentially answered in the following analysis.

Fig. 7 shows another graphical construction—the bringing together of two fields from a distance.

## Contrast Ratio

Two approaching field edges are shown 7.2S apart. Thus, the second halation line flare plateaus just meet. The contrast ratio of the field brightness to the brightness just alongside the edge is  $B_1/B_2$ . At 3.6S spacing, the brightness between the field edges has increased considerably since now the first halation line plateaus just meet. In the 1.8S and 0.9S

spacing, further brightness increase occur in the area that should be absolutely dark. Finally, at 0.2S spacing, the familiar pattern of the dark line on a bright field shown is formed. The contrast ratio between the dark line and the bright field is  $B_1/B_2$ . This ratio is just one-half what is measured for the case of edge flare in the 7.2S spacing sketch. This is because  $B_3 = 2B_2$  since  $B_3$  is composed of the left-hand  $B_2$  plus the right-hand  $B_2$ .

If the line is narrow, Detail Contrast is also given by  $B_1/B_3$  or one-half  $B_1/B_2$ . This may be independently deduced, for at any spot in a uniform field, the hazy background brightness arrives equally from lines to the left or right. Thus, if all the lines to one side are removed, the background at the edge is only one-half the previous value.

It can be seen from Fig. 7 that the spill-in brightness is a fairly flat curve for spacings less than about  $2\frac{1}{2}S$ . Thus, over a dark line up to  $2\frac{1}{2}S$  wide, the contrast is only slightly better than the Detail Contrast. In fact, this rule applies roughly to any dark area having a mean diameter up to about 3S.

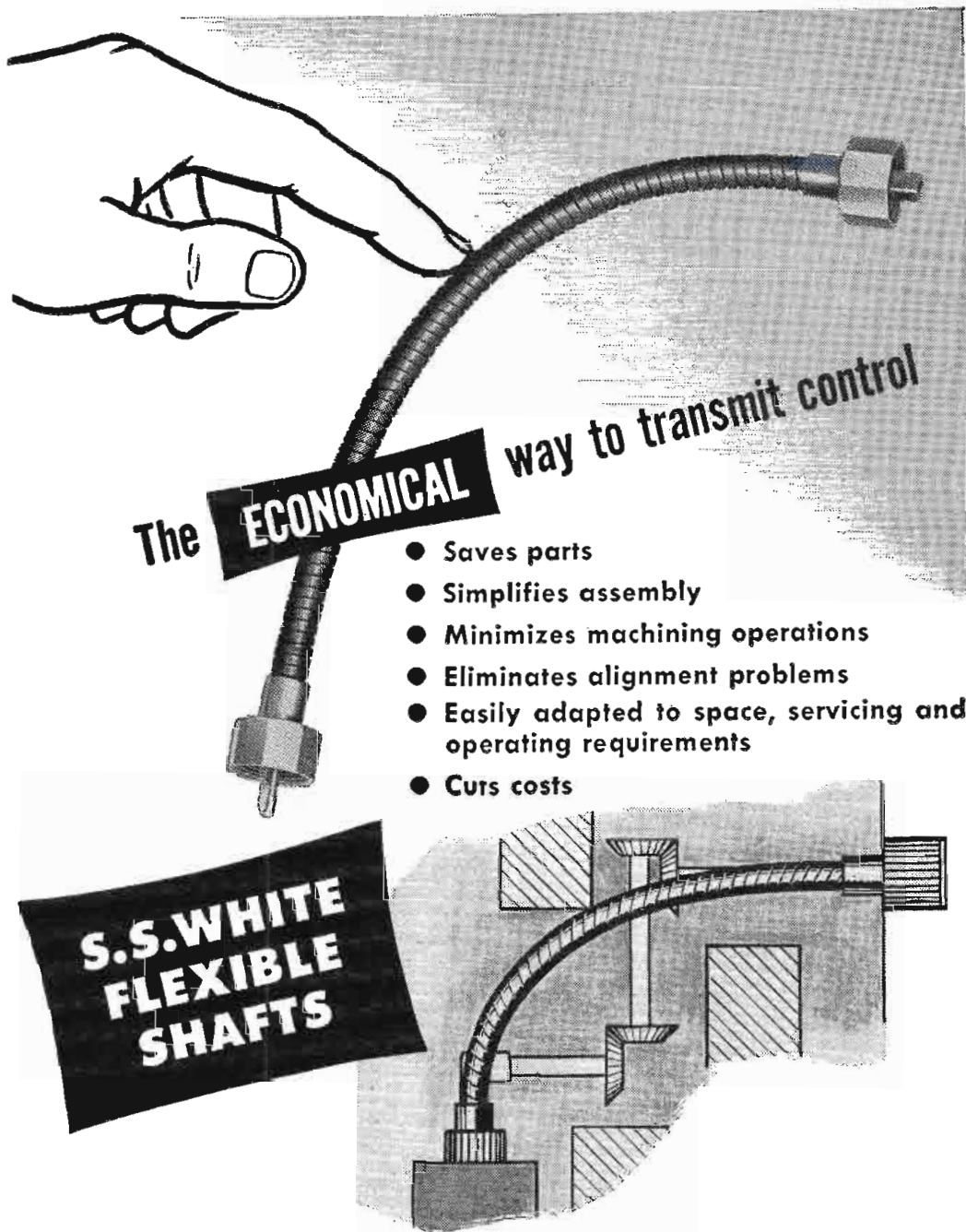
#### Grey-Faced Tube

In large CRT's, 3S may be as low as  $\frac{1}{20}$  picture height. However, in smaller tubes, such as 5", the area over which the contrast is degraded nearly as bad as the Detail Contrast condition, may be as much as  $\frac{1}{4}$  picture height. For these reasons, the DuMont Research Division considers that the grey-faced tube is necessary for any really high-quality television signal source or receiver, especially television recording devices.

The one unavoidable drawback is that some light is absorbed in the faceplate, 28% in the case of the 66% faceplate. In the case of the flying-spot scanner, this produces about  $1\frac{1}{2}$ db more noise in the highlights.

Surprisingly enough, however, it has been the consensus of all observers that the noise is actually reduced with the grey-face tube, as compared to the clear-face tube. This is because the flare present in the clear tube causes "flare noise" to be thrown into dark areas, whereas in the grey tube this noise is not present. The overall effect with typical subject matter is for the grey-face tube to produce definitely less noise, and in addition, the reduction in flare gives the picture more apparent resolution.

1. R. R. Law, "Contrast in Kinescopes," *Proc. IRE*, Vol. 27, pp. 511-524, Aug. 1939. Also reprinted in "Television-Volume III (1938-1941)," RCA Review (Publishers), 1946, pp. 294-324.



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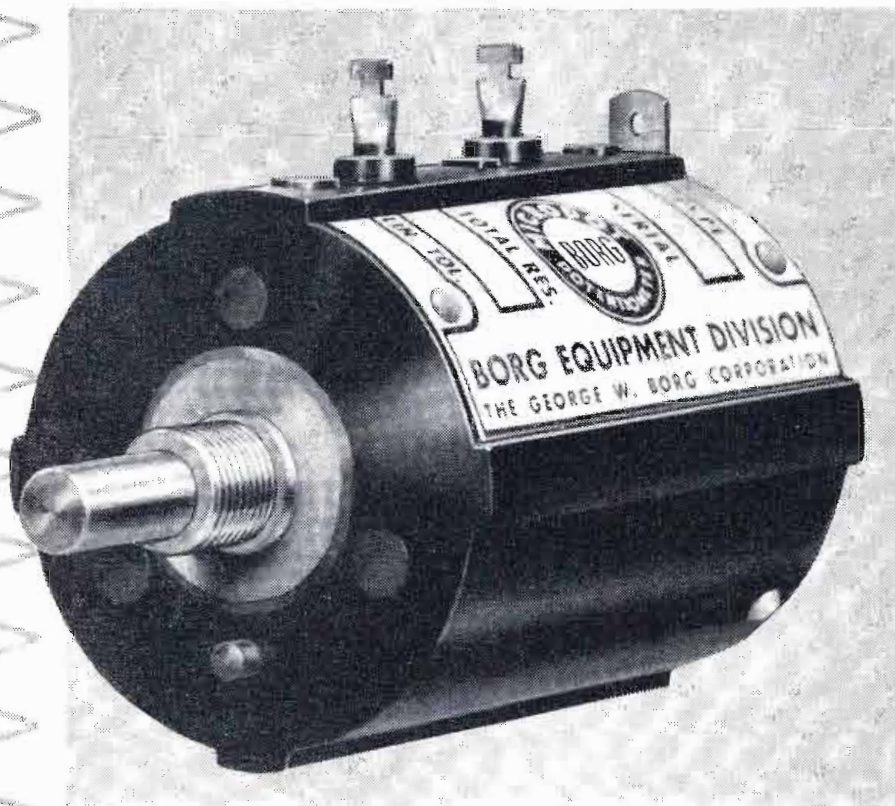
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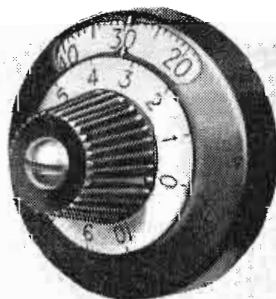


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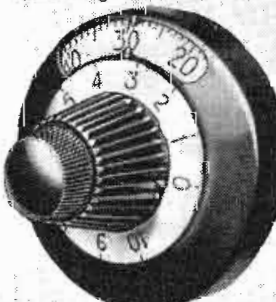
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MICRODIAL  
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**BORG  
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## Filter Loss

(Continued from page 97)

high receiver sensitivity is required as, for example, when measuring insertion loss levels of 60 db and over, some leakage from the signal generator or from poor cable or connectors may be picked up by direct radiation or by some unintentional coupling to the receiver antenna circuit. Well shielded and well filtered circuits and instruments are the best solution to this difficulty, but short of redesign of the offending equipment little can be done except to separate receiver from signal generator physically as far as reasonably possible; make sure all r-f connectors are tight, and use well shielded r-f cables. The existence of this spurious coupling effect is usually indicated by a variation in measured insertion loss with variation in the operators position ("hand capacity effect") or position of cables, pads, or the filter with respect to each other or to the ground plane.

## Impedance Differences

It is recognized that while considerable care is exercised in maintaining 50 ohm lines from the isolation pads up to the ends of the filter terminals, the impedance of the line from the outer ends of the terminals back to the filter housing will generally not be 50 ohms but will be a function of the inner diameter of the adapter sleeve and the outer diameter of the terminal (Fig. 3). Since this measurement system considers the filter to include everything from

(Continued on page 184)

## TUBE PLANTS OPENED



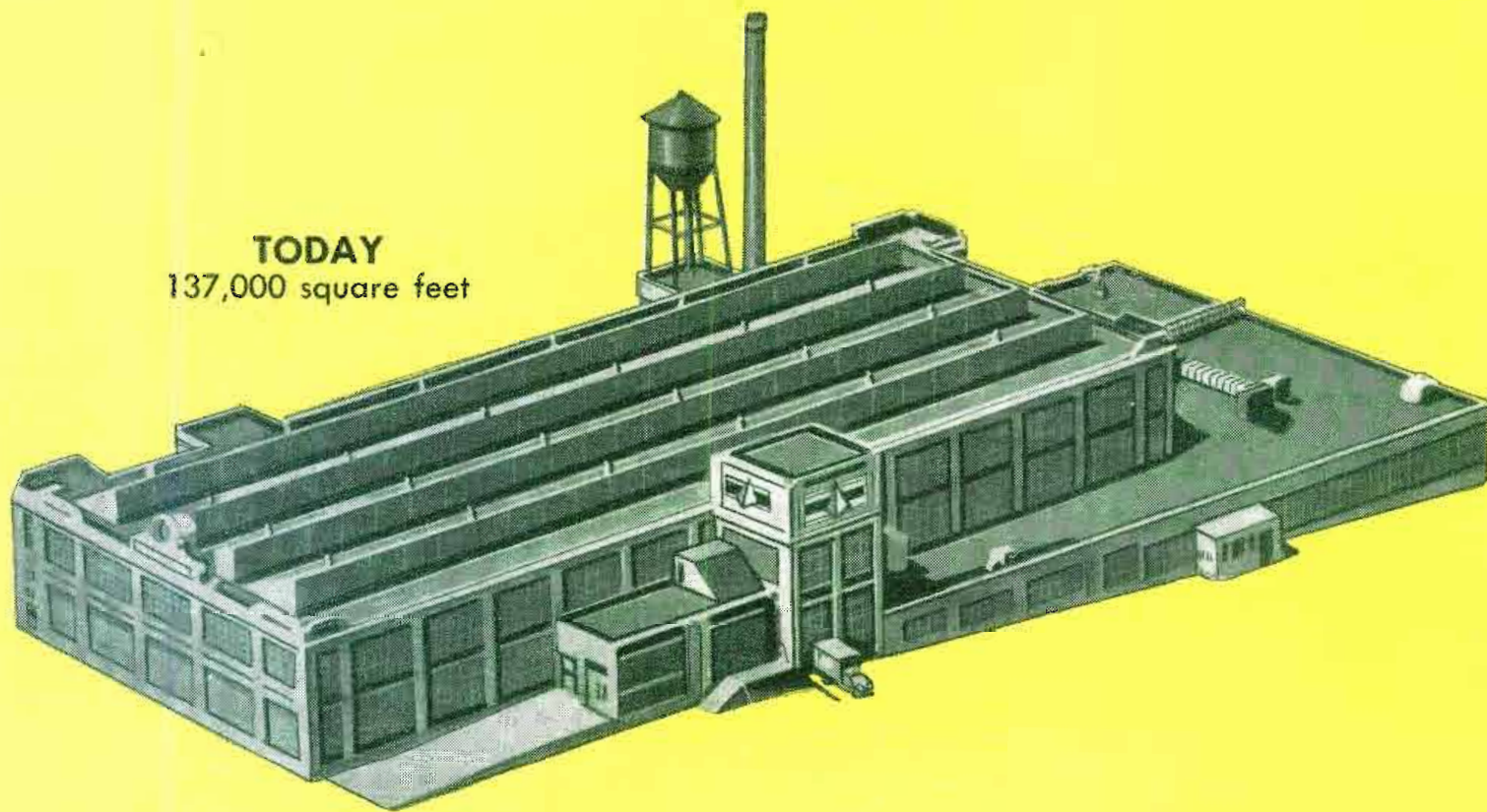
Westinghouse has officially opened two tube plants which began operations in Oct. 1952. The plant at Bath, N. Y. provides 145,000 sq. ft. for manufacturing 60 receiving tube types. The Elmira (N. Y.) plant, headquarters for the Electronic Tube Div., contains 365,000 sq. ft. for producing CR, broadcast and industrial tubes. Employee at Elmira plant, in photo above, is placing the wire leads of a gas-filled thyratron into composition base before placing the unit on basing machine to her left



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the outermost end of one terminal through the filter unit to the other terminal, the measurement should logically include any effect due to the presence of the terminals. The difficulty is, however, that the effect is arbitrary, depending on the inner diameter of the adapter sleeve and might conceivably vary with differences in this diameter. However, inasmuch as most filter terminals are relatively short compared to a quarter wavelength even at 1000 mc, this length of line would not be an appreciable factor in the great majority of measurements and would almost certainly be negligible below 400 mc. Any attempt to correct this situation, such as for example, extending the 50 ohm connecting lines with no discontinuity back to the filter container, might result in unwarranted mechanical complexity.

### Ultrasonic Machine Tool

An ultrasonic wave now drives a new kind of machine tool that carves fancy shapes, drills holes, and does other such work in hard steel, glass, ceramics, or even precious stones. The machine was developed by Raytheon Mfg. Co., and was first used for mixing so-called immiscible liquids. Now the device, which employs magnetostrictive principles, has been developed into a machine tool which is expected to have widespread applications in many metal-working industries.

The cutting tool, which can be made of relatively soft material such as brass, travels only a few thousandths of an inch each way. The ultrasonic machine tool works this way when drilling, for example, an ordinary round hole: The work is clamped firmly in place, and the tool is lowered until it is in contact with the surface. A liquid abrasive is flowed over the work in a continuous stream. Then the power is turned on. The tool, vibrating at approximately 27,000 times per second, drives the abrasive particles at ultrasonic speed. These extremely small particles strike the work at 5,000 to 10,000 times their normal weight, due to the acceleration which they have been given by the ultrasonic tool. This action cuts away the material. Such difficult materials as alnico, tungsten carbide, boron carbide, quartz, optical glass, molybdenum, and carbon may be machined quickly and accurately. The work need not be a conductive material.

The magnetostrictive aspect of the tool's operation refers to a coil wrapped around a nickel rod. An ultrasonic alternating current is passed through it, causing the nickel rod to contract and expand minutely with each cycle of current. The ultrasonic energy is amplified, first through a circuit of vacuum tubes, then mechanically by a series of cones that concentrate the force at their apices. The cutting tool or die is mounted on the apex of the lowest cone.

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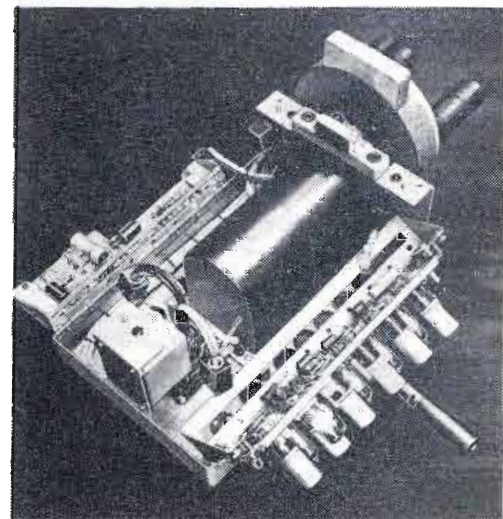
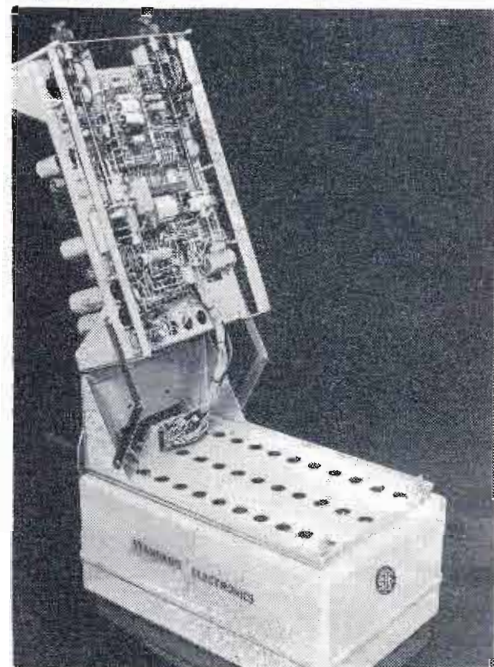
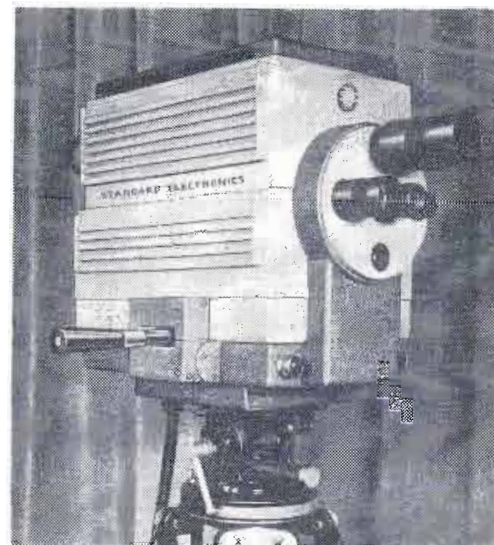
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## NEW TV CAMERA



Standard Electronics Corp., a Claude Neon subsidiary, has announced a radically new TV camera chain, the SE-TE 468. The camera weighs only 72 lbs., and sells for about \$15,000. Prime feature is the Multi-Con pick-up tube which will operate after 30 seconds warm-up, requires no special heater or blower, need not be rested or rotated, will run 1200 hours, and may be replaced for only \$300. It is reported that Multi-Con will not burn in or blow out. Electrical controls and power supplies are located at a separate desk, not in the camera. Single lever (top photo) controls focus and lens change. Plug-in electronic viewfinder (center) may be lifted for simple maintenance. With viewfinder removed, preamp hinges open (bottom) to reveal shield housing pick-up tube and coils. Standard Electronics is located at 285 Emmet St., Newark, N.J.

## TV Station Planning

(Continued from page 126)

another outstanding feature of the video relay control system. This console is designed expressly for use by program and technical directors in supervising studio programs. The console is only 37 in. high (which allows full view over the top and into the studio). It can accommodate as many as five 10-in. monitors, which are recessed below the desk top to prevent direct light from striking the screens. These five monitors can provide the directors with preview pictures of all cameras, if desired, plus pictures from a network signal and the program line.

With the video relay switching system, all video inputs may be handled at one central location, thereby simplifying the video cable distribution system. Several other advantages, such as simultaneously switching audio and video, "sync" interlock, extended control of tally lights, and previewing of special effects may be easily accomplished.

Master control is that portion of a switching system which selects the desired composite signal for final transmission, be it for network, transmitter or both.

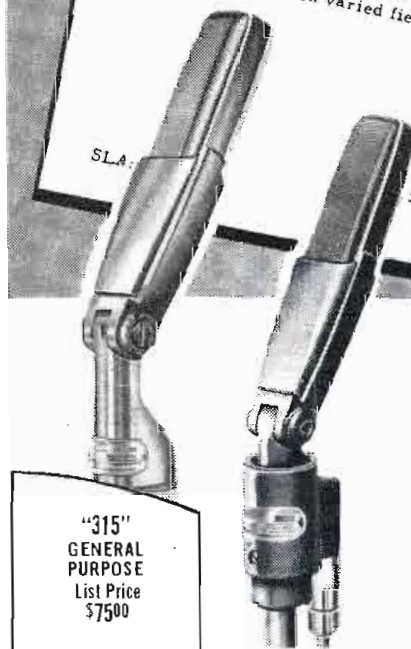
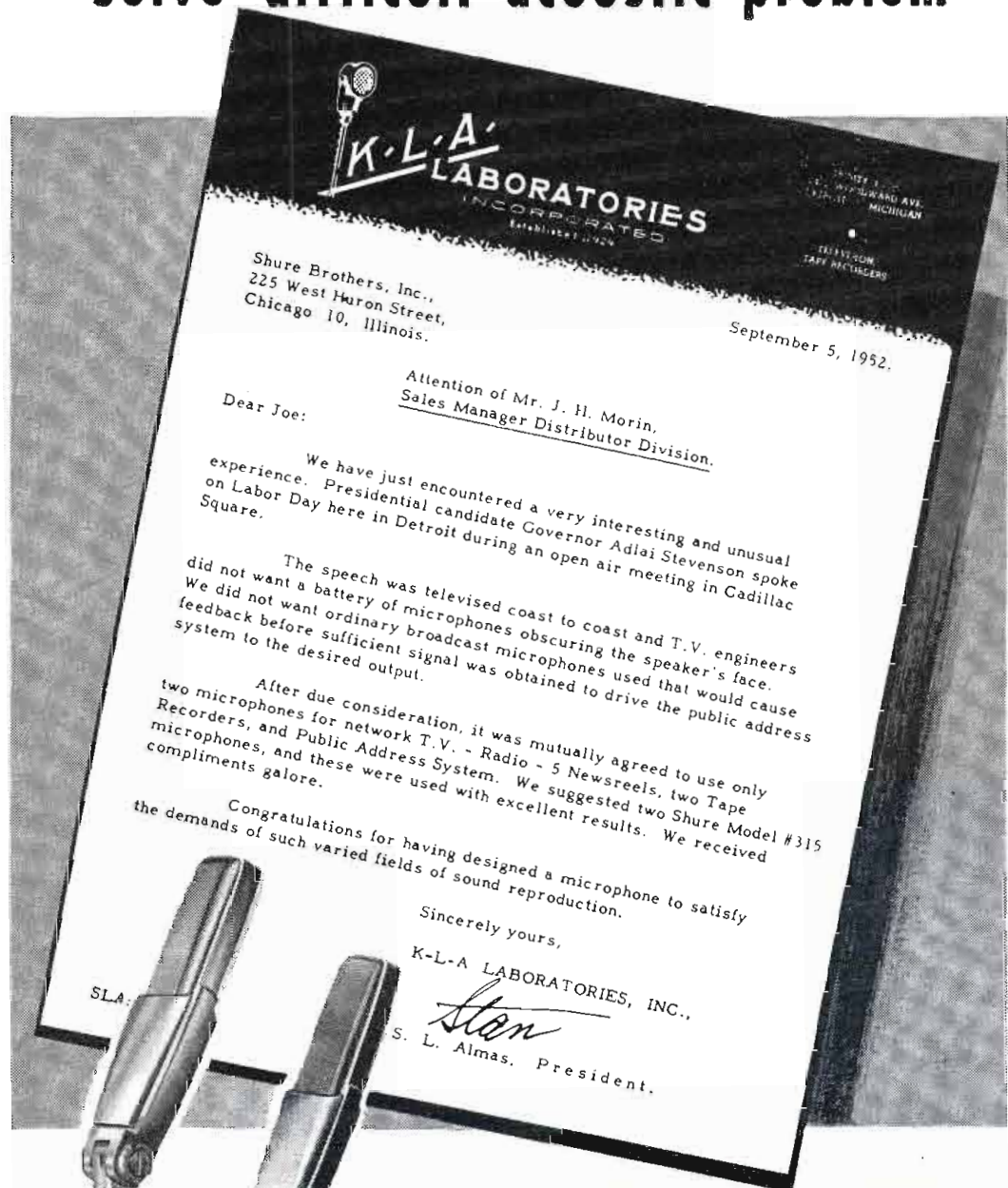
It is imperative, therefore, that some means be provided to monitor both audio and video incoming outgoing signals. In the cases of both audio and video a means of adjusting voltage levels must be provided. A "VU" meter usually provides this service for the audio signal while a CR oscilloscope acts in a similar fashion for the video signal. Generally these indicators are provided as "built in" adjuncts of various items of equipment.

In considering any master switching system, it should be borne in mind that some means must be provided for monitoring audio and video inputs and outputs, and also to measure and establish proper signal levels. Obviously, an ideal system would be one which provides monitors for all signals at all times, but such a system could be quite cumbersome, complex and expensive. The next simpler and more practical system is one in which one monitor is always on the outgoing line, while another is switchable to any of the incoming signals. Where a separate master control room is used, it is customary to bring incoming network and remote lines into this central (clearing house) point.

All necessary adjustments and  
(Continued on page 188)

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Former Governor Stevenson of Illinois, pictured as he addressed Detroit audience on Labor Day, during the 1952 presidential campaign.



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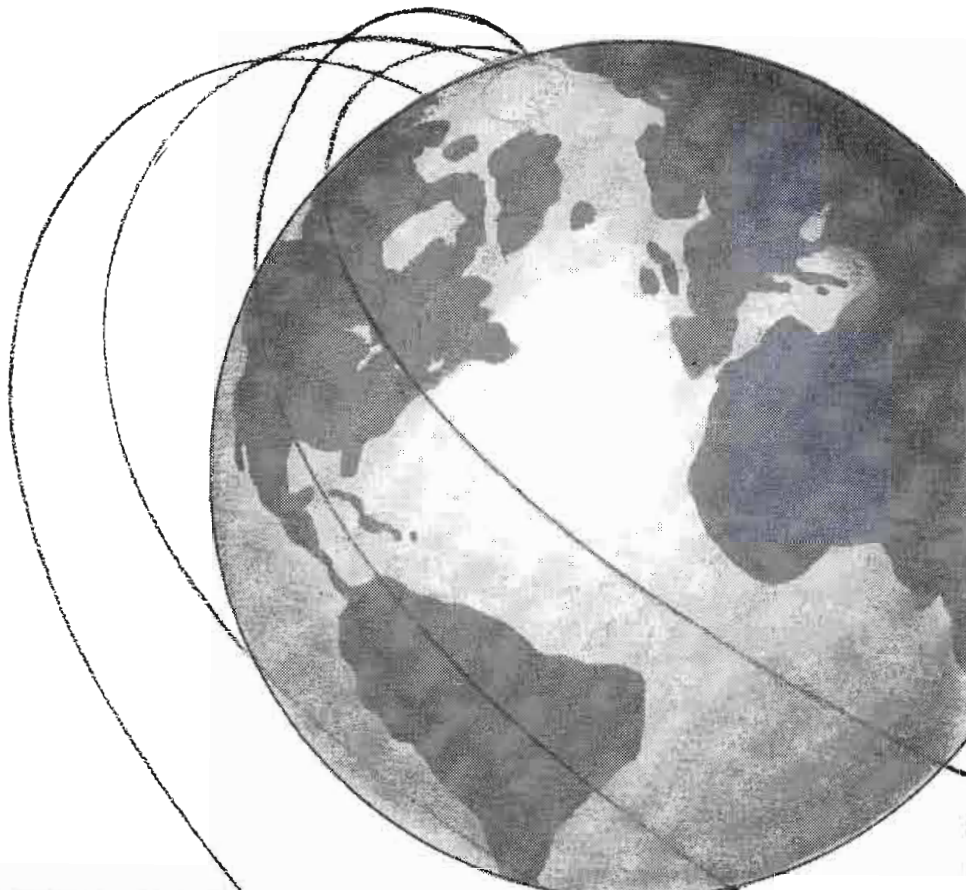
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the distribution of these signals is accomplished in master control. They are then fed to their respective points of use by means of a system of jacks. In these cases, it is also a practice to provide inexpensive monitors which are always on the line merely to indicate that there is a signal present. The switchable monitor, as mentioned before, is used to make the necessary technical checks and adjustments. In each of these cases the same conditions are assumed for audio and video signals. Furthermore, duplicate monitoring facilities may be provided in the studio control room.

A simple arrangement for the "B" layout is to use the switching system as shown in Fig. 10. This, in effect, is the same basic system as that employed for stations "A" and "A-Prime" and treats the studio output as a remote signal. In this instance, however, the console in master control serves a dual function. In addition to being a master switching console, it provides programming service when the studio equipment is being used for rehearsal, or is completely shut down, thereby keeping the cost of operation to a minimum. The monitoring section of the console may be used to preview all video and audio signals, and also monitor the several transmitter signal check points.

There are also other means of switching signals at master control, as for example, the simplest form using the bridged T networks. This consists of a mechanically interlocked system with six inputs and three outputs, two for line and one for monitor. It is normally a rack mounted panel for video only, and requires the distribution amplifier sections in close proximity in order to maintain good frequency response. By means of an extra contact on each switch position relays may be actuated to switch audio and video simultaneously.

A still more flexible method of performing master switching is to use the video-relay system, which is described in detail under Plan "C". Here, as in the studio camera relay switching, the same advantages of shorter video cables, greater flexibility, and more complete control are realized.

It is quite possible that some TV planners utilizing Plan "B," "A-Prime," or even "A" will rely on remote pickups to provide an important part of the station's income. In this event, plans should include garage facilities to accommodate the mobile vehicle (See Plan "C").

The first considerations in the planning and building of a TV station of the Plan "C" size are: (1) the use of two or more live talent studios, (2) expansion of the customary film facilities, and (3) the use of a separate master control setup. This type of station also includes facilities for originating and broadcasting network shows.

Specifically, such a station is usually provided with the following, which are included in Plan "C." See Fig. 13.

1. Film projection rooms which may have a separate control room, if desired.

2. Two or more studios with individual control rooms so that rehearsals may be carried out while other studio programs are "on-the-air."

3. Facilities for picking up remote events.

4. Master control room where desired program material may be selected from any of the previously mentioned sources for network and broadcast purposes. Master control may or may not be a combined transmitter control room depending on the particular conditions involved.

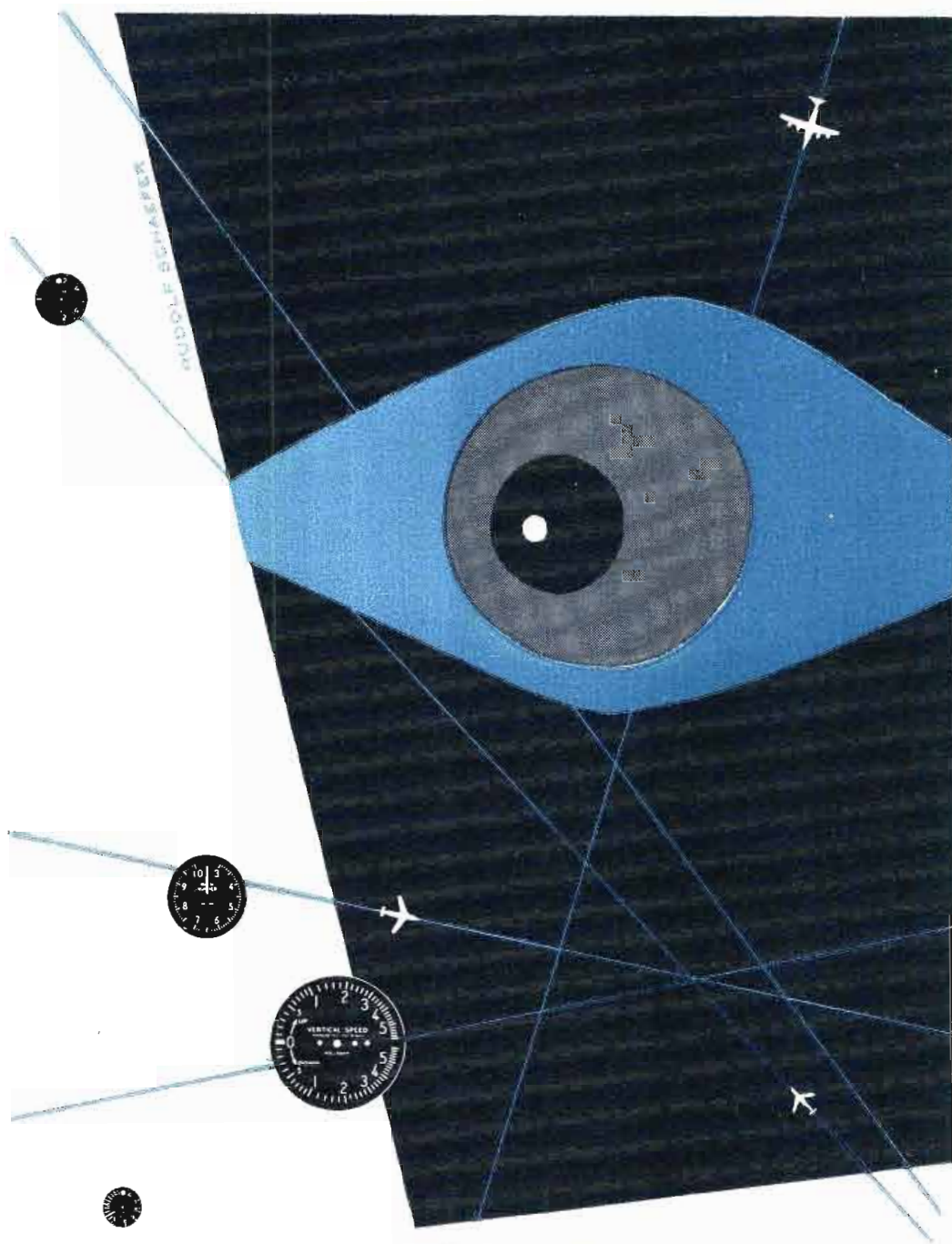
#### General Plan "C" Considerations

The same general considerations described for the smaller stations also apply to Plan "C" and there are several additional points that deserve attention. First, it should be understood that the Plan "C" station is not the ultimate as far as "all-inclusive" programming and studio facilities are concerned. However, it does illustrate one possible arrangement of studios and the companion equipment needed for the larger or "master-type" station. See Fig. 14.

In some instances, the physical arrangement of various control units may be such that differences in electrical time between various pulses in the system become greater than can be endured for proper operation. In that case, it becomes necessary to compensate for these differences. If the differences are small; it may be practical to use lengths of standard coaxial cable to provide the needed compensation. Where differences are appreciable, it may be more practical to use a delay line designed specifically for the purpose.

The Plan "C" station can be considered as a prototype for all stations larger than Plan "B," although Plan "C" is illustrated as employing a minimum of standard video com-

*(Continued on page 190)*



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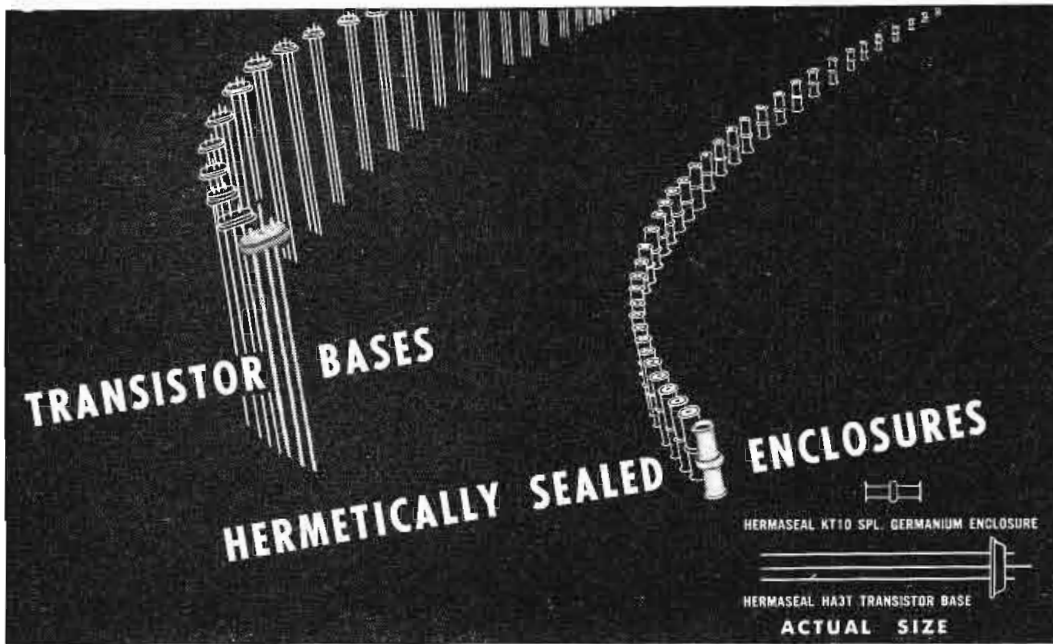
- X AIRCRAFT INSTRUMENTS AND CONTROLS
- X OPTICAL PARTS AND DEVICES
- X MINIATURE AC MOTORS
- X RADIO COMMUNICATIONS AND NAVIGATION EQUIPMENT

Current production is largely destined for our defense forces; but our research facilities, our skills and talents, are available to scientists seeking solutions to instrumentation and control problems.



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Let Hermaseal help you with your transistor mounting and protection problems. Our pioneering in the development and mass production of bases and sealed containers for solid state devices has reached the point where we are now able to supply them in quantity to additional customers. We have solved many of the problems connected with mounting and heat and humidity protection of germanium diodes, point-contact transistors, and junction transistors for a wide variety of applications.

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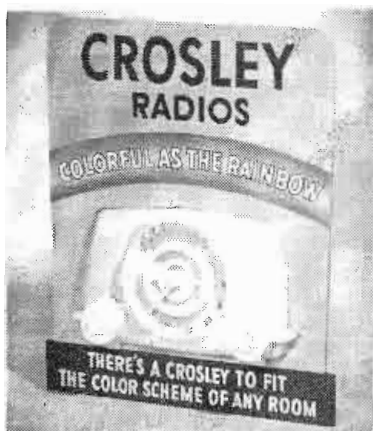


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ponents, many additional innovations are "spare" equipment features can be easily added.

Plan "C" is equipped with two studios, one large "three-camera" unit and a somewhat smaller "two-camera" unit. Additional microphones are recommended, as are additional studio monitors, and studio loudspeaker for turntable feed and talkback. Since programming for this station is on a much more elaborate scale, the space provided to accommodate properties and sceneries is proportionally larger. Other auxiliary facilities such as record library, dark room and additional offices are provided in this plan.

Each studio has its associated control room with elevated platform setups to provide good visibility into programming areas. Space is provided, as in Plan "B," for operation with a Program Director seated at the console on a platform at a second level, or with the Director seated at the same level as that of the video and audio operators in front of a common "in-line" console.

The arrangement of the control equipment for the two-camera studio is identical to that described for the control room of Plan "B," and offers equal flexibility. Monitoring, switching and remote control features are all similar and need not be again described. The possibility of employing video-relay switching, as previously described, also applies to the studio control rooms of Plan "C." The "three-camera" studio control room has the same facilities as that of the smaller unit except for the addition of another camera control console section.

### **Plan "C" Audio**

The audio control equipment needed to satisfy the requirements of Plan "C" are similar to that of Plan "B" and consist of Console, ringdown console for the smaller "two-camera" studio. Equipment is located in line with companion video consoles. Mixing and switching facilities are provided by the audio console. Each of its eight possible simultaneous inputs is controlled by a high level mixer. Talkback facilities, turntable mixers with built-in cueing switches and an "override" switch are provided.

The larger "three-camera" studio audio facilities are identical except for the possible audition of the auxiliary mixer console which would provide for the use of any four of 12 additional microphone inputs.

Referring to the floor plan of Fig.



14, it will be noted that there are two studios; one large, with its associated control rooms and a smaller studio with its control room. There is also a film projection room with its associated controls located in the master control room.

Each studio is a complete unit capable of producing live talent shows. The output from the film controls, as well as from each studio, and signals from networks and remote pickups are routed through master control.

Facilities are available for handling a number of remote signals by telephone company lines and by microwave relay. Stabilizing amplifiers are available on the same jack panels as the incoming signals so that they can be connected into the circuits. The stabilizing amplifiers are designed to set the proper synchronizing-to-picture ratio and to improve the quality of the synchronizing signal of incoming remotes. The stabilizing amplifier utilizes clamp circuits to remove hum, bounce, and other line disturbances.

The relay receivers and the stabilizing amplifiers are rack-mounted in the master control room and their remote controls are brought to a console section for convenience in setting-up and operating the equipment. Each of these pieces of equipment has two outputs available at jack panels so that signals can be fed to the master switching system or to the studio camera switching system independently. In master control, the desired signal can be fed to any one of the outgoing lines.

Here again, it should be understood that the same arrangement of equipment as that outlined in Plan "B" may be used.

#### Plan "C" Master Relay Switching

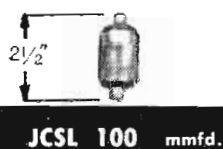
The use of more inputs, sync interlock, and shorter coax cable runs fits in naturally with relay switching, which makes programming smoother and easier. It also provides a means of switching audio and video simultaneously, and includes a greater number of tally light controls necessary in larger operations.

A simple relay switching system is one composed of six inputs and two outputs.

For a more comprehensive system, it is possible to extend functions to 12 inputs and six outputs. For an operation of this size, requirements usually become more involved than those previously mentioned and should be discussed at length with a systems planning group.

(Continued on page 192)

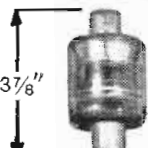
### FIXED TYPE



JCSL 100 mmfd.



JCSL 250 mmfd.



JCSL 500 mmfd.  
JCSL 750 mmfd.



JCSL 1000 mmfd.  
JCSL 1500 mmfd.

### VARIABLE TYPE



UCSL 4-250 mmfd.



UCSL 5-500 mmfd.  
UCSL 7-750 mmfd.



UCSL 7-1000 mmfd.



UCSL 10-2000 mmfd.

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## A FULL LINE OF CLOSE SPACED MINIATURE FIXED AND VARIABLE VACUUM CAPACITORS

Rated at 3 KV and 5 KV



All copper construction  
for  
High amperage loads



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LITERATURE MAILED UPON REQUEST



JENNINGS RADIO MFG. CORP. · P.O. BOX 1278  
970 McLAUGHLIN AVE. · SAN JOSE 8, CALIF.

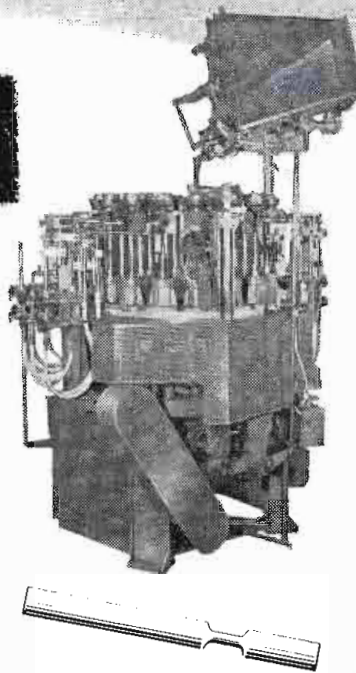
# TRANSISTORS

**must be  
hermetically sealed  
in glass  
and evacuated**

**for complete assurance  
of long life  
and reliability**

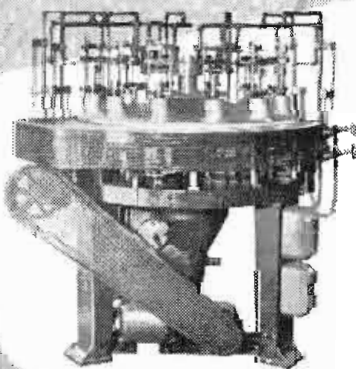
Recent developments have demonstrated that transistors must be sealed hermetically in glass and evacuated to protect them from the effects of heat, humidity, contamination, corrosion.

Only KAHLE Equipment provides automatic means for producing dependable Transistors hermetically sealed in glass and evacuated... at high production... at low cost... and in sub-miniature dimensions.



**MODEL 1991**

*The sub-miniature bulb, flattened, formed, constricted and tubulated is produced on this Kahle machine.*



**MODEL 1384**

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Kahle also produces the automatic Sealing and Exhaust Equipment as well as the automatic Welding Equipment for producing the transistor components.

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**Kahle** ENGINEERING COMPANY  
1313 SEVENTH STREET NORTH BERGEN N. J.

There are many who feel that their programming requirements are such that some means of switching and fading should be included in master control (particularly where it is desirable to superimpose local advertisements on network programs). In such instances, a system using the studio switcher, field switcher, or a video relay system in conjunction with the "Gen-lock" is necessary. The output, of the system chosen, could be fed into one of the Master Switching inputs mentioned earlier.

## Switching Control

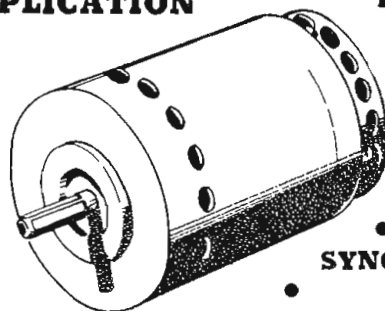
All switching for the station (including studio camera switching) may be accomplished by relays located in the master control room. Video signals, local and remote, are fed to jack panels where they can be connected through to the corresponding video switching relays. These relays are controlled from pushbuttons located in the various switching positions. Each studio control room has associated with it four banks of interlocked relays, two for the fader amplifier and one for the preview monitor and one for the program line and monitor. Two synchronizing generators (one a spare) are provided in the master control room with a switch to select the desired generator for use. This then feeds distribution amplifiers to distribute the blanking driving, and synchronizing signals to the various parts of the system. In case the differences in physical separation of the Master Control Room and the individual studio control room is great, delay compensation can be inserted between the sync generator and the various distribution amplifiers.

## System is Flexible

This overall system is extremely flexible as it provides numerous combinations of camera facilities for programming and rehearsal. Cameras and remotes can be patched into any studio switching system so that the program director at his console in a studio control room can have complete control over the switching of any studio cameras, film cameras, or remotes that he may require to make up a given program. A complete film program can be run entirely from the master control room when required. In this way, the facilities of an individual studio may be used for rehearsals while another studio or film is put on the air. One film chain may be used for

## YOUR PRECISE MOTOR APPLICATION

... all small, sub-fractional A.C. motors for rotating equipment and cooling needs, are engineered for high shock resistance with rigid construction.



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**FANS**

**BLOWERS**

**SYNCHRONIOUS**

**VARIABLE FREQUENCY**

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CATALOG #653



a program while other film is pre-viewed in a client's room without interference. Thus, almost any combination of facilities may be used to suit the particular requirements that may arise.

### Plan "C" Remote Facilities

Plan "C" includes complete garage facilities for the mobile unit which permits the "C" station to include "remote pickups" in its programming plans.

It includes the essential equipment for a remote pickup: cameras, sync generators, switching facilities, power supplies, and a means for relaying picture information back to the station. Those items normally operated from the control room, such as camera controls, are transported in their operating position. Other items such as cameras, tripods, dollies, cable reels, and microwave transmitters have space allotted inside the vehicle for transportation. Outside doors to the storage cabinets permit direct side-loading of all heavier equipment. The inside of the mobile unit is divided into two separate compartments: an operating compartment and a storage compartment. The entire front section is the operating or control room and is separated from the storage section in the rear by a partition fitted with a sliding door. Entrance to the control room is through the front side doors. The door windows and windshield may be readily covered by a curtain secured with snap fasteners to exclude outside light. This operating section of the "studio on wheels" has three levels for operating equipment. The layout provides space at floor level for four field power supplies and the field sync generator. The second level is the actual table operating position and has space for three field camera controls, a field master monitor, field switcher, and an audio mixer amplifier. The third level is directly over the camera controls and provides space for the air conditioner, microwave relay transmitter control, and power control panel. The roof is reinforced to support the weight of personnel and operating equipment such as cameras and tripods.

### Check Points and Precautions

To present all of the equipment planning considerations necessary in the proposed construction of a TV station would be beyond the intended scope of this article. How-  
(Continued on page 194)

# new

MANUALLY-OPERATED

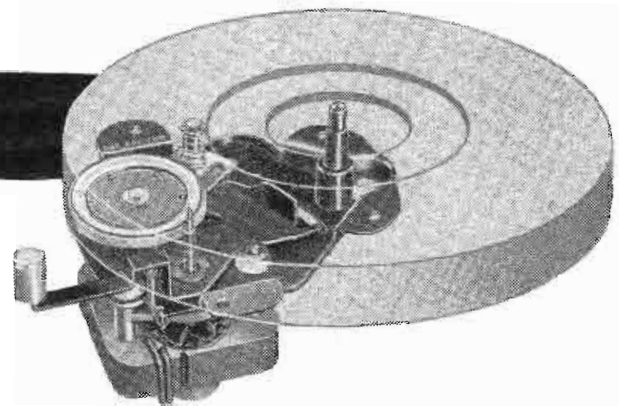
## Three-Speed Phonomotors by General Industries

### MODEL SS (2-pole motor)

Very compact 3-speed phonomotor incorporating vertical idler shifting principle. Idler wheel drives the turntable directly from appropriate step on motor shaft. Moving shift lever to "OFF" position automatically disengages idler wheel from motor shaft during non-operating periods.

Features include ribbed mounting plate, oilless bearing and dynamically-balanced motor. Turntable shaft revolves with turntable and is grooved for turntable clip. Furnished with 8" turntable.

Dimensions: Length: 5"; Width:  $4\frac{23}{32}$ ";  
Depth:  $2\frac{15}{32}$ " below mounting plate.



### MODEL DSS (4-pole motor)

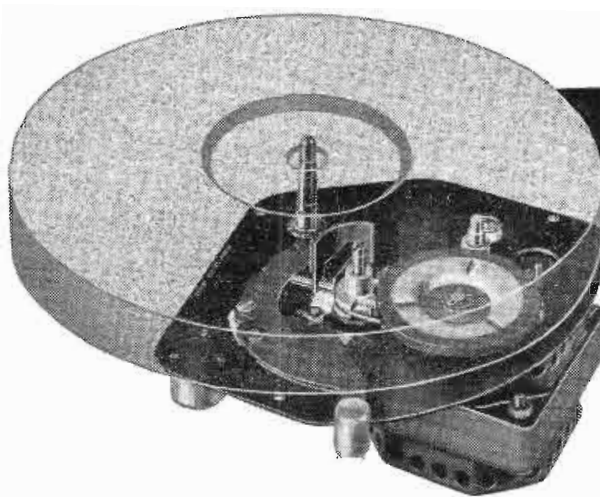
For applications in which compactness is secondary to need for absolute minimum of stray field radiation. Ideally suited for magnetic pickups.

Speed change is accomplished by vertical movement of idler wheel to appropriate diameter of motor shaft for desired turntable speed. Moving shift lever to "OFF" position automatically disengages idler wheel from motor shaft, and cuts off the current to the motor.

Features include precision construction throughout, oilless motor and turntable bearings, dynamically-balanced rotor. Furnished with 10" turntable.

Dimensions: Length:  $6\frac{5}{8}$ "; Width:  $6\frac{1}{16}$ ";  
Depth:  $2\frac{21}{32}$ " below mounting plate.

Both models available for immediate delivery. Write for quantity price quotations on these and other G.I. phonomotors.



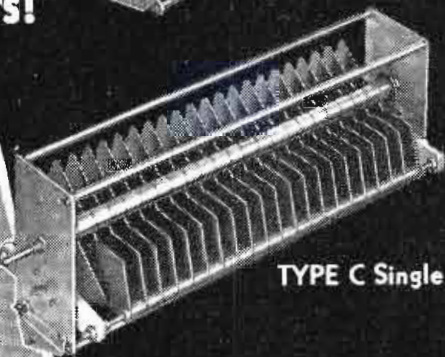
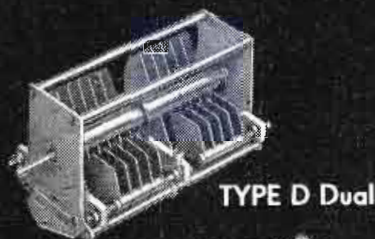
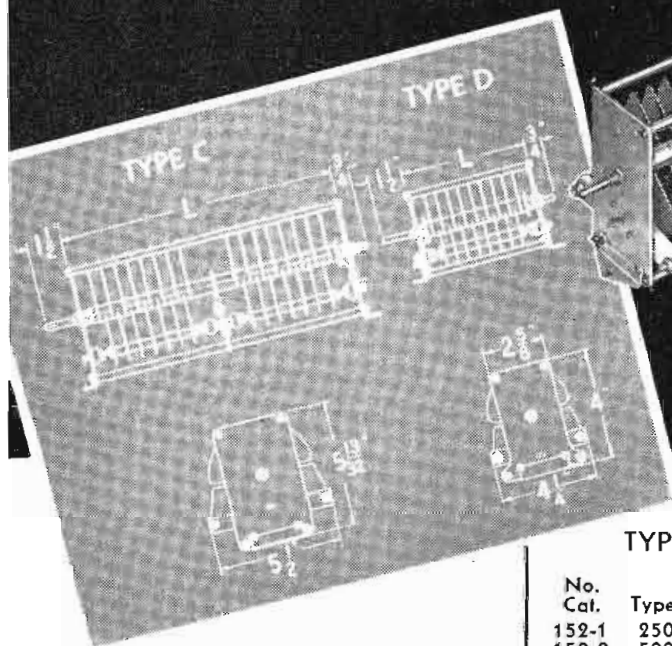
**THE GENERAL INDUSTRIES CO.**  
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### CONSTRUCTION

Heavy aluminum end frames, .051" plates and 5/16" tie rods assure extreme rigidity. Rotor contacts are laminated phosphor bronze. Dual models have center rotor contact for electrical symmetry. Low-loss Steatite insulators are located outside the most intense RF fields and used solely to support stator assemblies. Shafts are 1/4" diameter, cadmium plated with 3/4" rear extensions.

Mounting brackets furnished for normal or inverted mounting. End frames drilled and tapped for panel mounting, special brackets or mounting of accessory components.

### SPECIAL TYPES

Variations from standards such as special capacitances, ball bearings, dynamically balanced rotors, stainless steel shafts and right angle drive duals can be furnished in production quantities.

### TYPE C SINGLE SECTION

No. Cal.	Type No.	Cap. per Sect.		Spacing	Number Plates	L
		Max.	Min.			
152-1	250C70	252	34	.175"	24	6 <sup>13</sup> / <sub>16</sub> "
152-2	500C70	496	56	.175"	47	12 <sup>3</sup> / <sub>16</sub> "
152-3	250C90	245	45	.250"	31	12 <sup>3</sup> / <sub>16</sub> "
152-4	350C90	337	63	.250"	43	14 <sup>27</sup> / <sub>32</sub> "
152-5	50C110	51	19	.350"	8	4 <sup>23</sup> / <sub>32</sub> "
152-6	100C110	103	30	.350"	17	8 <sup>19</sup> / <sub>32</sub> "
152-7	250C110	251	66	.350"	41	18 <sup>9</sup> / <sub>32</sub> "
152-8	50C130	51	24	.500"	10	7 <sup>11</sup> / <sub>16</sub> "
152-9	100C130	102	42	.500"	21	13 <sup>11</sup> / <sub>16</sub> "

### TYPE C DUAL SECTION

152-501	200CD45	204	21	.125"	15	8 <sup>19</sup> / <sub>32</sub> "
152-502	300CD45	290	26	.125"	21	10 <sup>3</sup> / <sub>16</sub> "
152-503	200CD70	198	27	.175"	19	12 <sup>3</sup> / <sub>16</sub> "
152-504	300CD70	305	37	.175"	29	16 <sup>25</sup> / <sub>32</sub> "
152-505	150CD90	147	30	.250"	19	14 <sup>27</sup> / <sub>32</sub> "
152-507	50CD110	50	18	.350"	8	10 <sup>3</sup> / <sub>16</sub> "
152-509	100CD110	103	32	.350"	17	16 <sup>25</sup> / <sub>32</sub> "
152-510	50CD130	51	24	.500"	10	14 <sup>27</sup> / <sub>32</sub> "

### TYPE D SINGLE SECTION

153-2	100D35	99	14	.080"	8	2 <sup>29</sup> / <sub>32</sub> "
153-4	250D35	252	24	.080"	20	4 <sup>25</sup> / <sub>32</sub> "
153-6	500D35	496	36	.080"	39	6 <sup>25</sup> / <sub>32</sub> "
153-7	100D45	104	19	.125"	12	4 <sup>25</sup> / <sub>32</sub> "
153-8	150D45	146	23	.125"	17	4 <sup>25</sup> / <sub>32</sub> "
153-9	50D70	51	17	.175"	7	2 <sup>29</sup> / <sub>32</sub> "
153-10	70D70	72	18	.175"	11	4 <sup>25</sup> / <sub>32</sub> "
153-11	100D70	98	23	.175"	15	4 <sup>25</sup> / <sub>32</sub> "
153-12	150D70	151	31	.175"	23	6 <sup>13</sup> / <sub>16</sub> "
153-13	250D70	244	45	.175"	37	10 <sup>3</sup> / <sub>16</sub> "
153-14	350D70	351	62	.175"	53	13 <sup>14</sup> / <sub>16</sub> "
153-15	50D90	53	20	.250"	10	4 <sup>25</sup> / <sub>32</sub> "
153-16	70D90	73	25	.250"	14	5 <sup>13</sup> / <sub>16</sub> "
153-17	100D90	99	30	.250"	19	7 <sup>11</sup> / <sub>16</sub> "
153-18	150D90	149	43	.250"	29	10 <sup>3</sup> / <sub>16</sub> "

### TYPE D DUAL SECTION

153-501	100DD35	95	13	.080"	8	4 <sup>25</sup> / <sub>32</sub> "
153-502	150DD35	147	15	.080"	12	5 <sup>13</sup> / <sub>16</sub> "
153-503	200DD35	202	19	.080"	16	7 <sup>11</sup> / <sub>16</sub> "
153-504	300DD35	291	24	.080"	23	9 <sup>13</sup> / <sub>16</sub> "
153-505	500DD35	496	38	.080"	39	13 <sup>11</sup> / <sub>16</sub> "
153-506	150DD45	155	24	.125"	18	9 <sup>15</sup> / <sub>32</sub> "
153-507	200DD45	198	27	.125"	23	12 <sup>3</sup> / <sub>16</sub> "
153-508	50DD70	52	15	.175"	8	5 <sup>13</sup> / <sub>16</sub> "
153-509	70DD70	72	17	.175"	11	7 <sup>11</sup> / <sub>16</sub> "
153-510	100DD70	97	22	.175"	15	9 <sup>15</sup> / <sub>32</sub> "
153-511	150DD70	151	31	.175"	23	13 <sup>11</sup> / <sub>16</sub> "
153-513	50DD90	52	19	.250"	10	9 <sup>15</sup> / <sub>32</sub> "
153-514	100DD90	97	30	.250"	19	14 <sup>27</sup> / <sub>32</sub> "

For complete information on other types of JOHNSON variable capacitors, write for your copy of General Products Catalog 973



## E. F. JOHNSON COMPANY

CAPACITORS, INDUCTORS, SOCKETS, INSULATORS, PLUGS, JACKS, DIALS, AND PILOT LIGHTS

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ever, it is recommended that the following "check points" be kept in mind. It is further recommended that the services of a qualified Engineering Consultant be obtained to assist in this development of the basic planning and preparation of an application in its final form for presentation to the FCC.

1. Effect of future expansion of operations.
2. Transmitter power increases.
3. Site selection, antenna heights, and coverage for UHF.
4. Provide good power source.
5. Trench or duct layouts.
6. Floor loadings.
7. Check sizes of doorways to permit entrance of individual equipment units and scenery.
8. Avoid TV operation in vicinity of AM station or other interference generators.
9. Control room and master control arrangements.
10. Extent of film programming.
11. Film previewing, processing, editing and storage.
12. Clients' rooms.
13. Audience participation space.
14. Provide enough monitors to achieve smooth program performance.
15. Check necessary Audio and Intercom facilities.
16. Studio lighting.
17. House monitoring systems.
18. Mobile unit for remotes.

The authors wish to express appreciation to those assisting in this project, especially to E. G. Keith, R. J. Smith, and J. S. Almen of the Broadcast Section, RCA Engineering Products Department.

### LITTELFUSE PLANT VISIT



An extensive tour of the new, modern Des Plaines plant was one of the highlights of an all-day visit by eight foreign visitors to Littelfuse, Inc. The program for the day was conducted by Jack Hughes, Littelfuse vice president, shown at the extreme right explaining one of the operations in the manufacture of quality fuses, to (front row, left to right), Mario R. Aguilar, Mexico City; Nathan Blomhof, Brussels, Belgium; Angel Mokuvos, Montevideo, Uruguay; Guillermo Lucas Royo, Havana, Cuba; and (back row, left to right) Octavio Bandeira, Chicago, vice consulate of Brazil; J. Augusto Gerlinger, Sao Paulo, Brazil; Anthony Forani, Brussels, Belgium; Lennie Brenna, Chicago; Burton Browne Advertising and Adres Lara Saenz, Madrid, Spain.

# **TELE-TECH's ELECTRONIC INDUSTRIES DIRECTORY 1953**

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PRODUCT FINDING INDEX

Table with 4 columns: Product, Section No., Code Letter, Product, Section No., Code Letter, Product, Section No., Code Letter, Product, Section No., Code Letter. Lists various electronic components like Vacuum pumps, Washers, Wire, etc.

ELECTRONIC INDUSTRIES DIRECTORY

Consulting Engineers

A complete alphabetical listing of individual engineers and engineering companies specializing in consulting services for the radio-TV-electronic and allied fields. The particular specialty of each engineer is indicated by a code letter following his name and address. For a listing of Commercial Companies Offering Consulting Services, see page 311.

- Broadcast . . . . . A
Communications . . . . . B
Component Manufacturing . . . . . C
Electronic Control Systems . . . . . D
Equipment Manufacturing . . . . . E
Industrial Electronics . . . . . F
Medical Electronics . . . . . G
Recording, Audio . . . . . H

- Adair G P 1610 I St N W Washington D C EX 3-1230A
Adler Communication Labs I LeFevre Lane New Rochelle N Y 6-1620 A,B,E
Amoo L R 3709 Carpenter Ave Des Moines Iowa 7292 A
Aster A K 48 Beech St E Orange N J D,F

- Feln Mitchell 237 E 81 St New York 28 N Y RE 4-6815 C,E,F
Frazier H S 708 Bond Bldg Washington 5 D C NA 8-2173 A
Frommer J C 1525 Teakwood Ave Cincinnati 24 Ohio KI 8730 D,F
Galanty H E 36 Montgomery Rd Livingston N J F

- McNary J C National Press Bldg Washington D C DI 7-1205 A
McNeal J D 794 Quinpiac Ave New Haven Conn HO 7-7012 D,F
McQuillan John P 0 Box 132 Dundee Ill F
Meyers J G 1056 Sheridan Ave New York 56 N Y H

# 1953 ELECTRONIC INDUSTRIES DIRECTORY

## Product Listings

This is a complete listing of all the end products, component parts, equipment, instruments, and materials in the radio-TV-electronic and related industries—with the names and addresses of the companies that

make them. Over 1800 product categories are arranged according to 99 major group headings, embodying more than 1,800 categories. Manufacturers are listed alphabetically under the group headings.

### I—AMPLIFIERS, AUDIO

**Amplifiers, audio** ..... A  
**Amplifiers, cuing** ..... C  
**Amplifiers, industrial sound** ..... D  
**Amplifiers, isolation** ..... E  
**Amplifiers, limiting** ..... F  
**Amplifiers, line** ..... G  
**Amplifiers, microphone** ..... H  
**Amplifiers, mixing** ..... J  
**Amplifiers, monitoring** ..... K  
**Amplifiers, musical instrument** ..... I  
**Amplifiers, noise-suppressing** ..... L  
**Amplifiers, recording** ..... M  
**Amplifiers, remote** ..... N  
**Amplifiers, tape playback** ..... O  
**Amplifiers, wideband** ..... P

Acorn Electronics Corp., Box 348, Gibson City, Ill.—A  
 Adler Communication Labs., 1 LeFebre Lane, New Rochelle, N.Y.—N  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—A,P  
 Air Associates Inc., 511 Joyce St., Orange, N.J.—A  
 Airtronix Devel. Corp., 20 W. 22nd St., New York 10, N.Y.—A,I,J,M  
 Alamo Electronics Corp., 105 W. Romana St., San Antonio, Tex.—I  
 Allied Allegri Machine Co., 141 River Rd., Nutley 10, N.J.—A,J,M  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—A,C,F,J,K,L,M,N,P  
 Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.—A,J  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—A,F,G,K,N  
 American Communications Corp., 306 Broadway, New York 7, N.Y.—A,K  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—A,J,M  
 Ansley, Arthur Mfg. Co., Doylestown, Pa.—A  
 Applegate & Co., C.J., 1816 Grove St., Boulder, Colo.—E  
 Approved Electronic Instrument Corp., 928 Broadway, New York 10, N.Y.—A  
 A.R.F. Products, Inc., 7627 Lake St., River Forest, Ill.—A  
 Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, N.Y.—A  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—P  
 Audar, Inc., Box 438, Pasadena, Calif.—A  
 Audio Equip. Co., 805 Middle Neck Rd., Great Neck, L.I., N.Y.—A  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—A  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—A,F,G,J,K,M,P  
 Austin Co., 76 Ninth Ave., New York 11, N.Y.—A  
 Authorized Mfrs Service, 153 Spencer St., Brooklyn 5, N.Y.—A  
 Autocrat Electronics Co., 5024 Elm St., Skokie 8, Ill.—I  
 Automatic Radio Mfg. Co., 122 Brookline Ave., Boston 15, Mass.—A  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—A  
 Baughman Co., E.J., 350 S. Central, Los Angeles 13, Calif.—A  
 Beam Instruments Corp., 350 Fifth Ave., New York 1, N.Y.—A  
 Beam Radionics Corp., 224 N. Desplains St., Chicago 6, Ill.—A  
 Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio—A,I,M  
 BENDIX RADIO DIV., BENDIX AVIATION CORP., E. Joppa Rd., Towson 4, Md.—A  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—A,M  
 BLONDER-TONGUE LABS., 526 North Ave., E., Westfield, N.J.—G,P  
 Boehme Inc., H.H., 915 Broadway, New York 10, N.Y.—P

BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—P  
 Bogen Co., David, 29 Ninth Ave., New York 14, N.Y.—A  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—A  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,C,F,G,J,K,L,M,N  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—A  
 British Industries Corp., 164 Duane St., New York, N.Y.—A  
 British Radio Electronics, 1 Thomas Circle, Washington 5, D.C.—A  
 Broadcast Equip. Spec. Corp., 135-01 Liberty Ave., Richmond Hill 19, N.Y.—A,M  
 Brociner Electronics Lab., 15 46 Second Ave., New York 28, N.Y.—A  
 Brook Electronics Inc., 34 DeHart Pl., Elizabeth 2, N.J.—A  
 Brooks Radio & T.V. Corp., 84 Vesey St., New York 7, N.Y.—A  
 Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles 34, Calif.—A,M  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—A  
 Bunnel & Co., J.H., 81 Prospect St., Brooklyn 1, N.Y.—M  
 Calbest Eng'g. & Electronics Co., 828-830 N. Highland Ave., Hollywood 38, Calif.—A,I  
 Califone Corp., 1041 N. Sycamore St., Hollywood 38, Calif.—A  
 Caltron Products Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.—A  
 Canoga Corp., 5955 Sepulveda Blvd., Van Nuys, Calif.—P  
 Carad Corp., 93 Leland Ave., San Francisco 28, Calif.—N  
 Carbonneau Industries, Inc., 100 Lexington Ave., S. W. Grand Rapids, Mich.—A  
 Century Projector Corp., 729 7th Ave., New York 19, N.Y.—A  
 C.G.S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—A,N  
 CINEMA ENG'G. CO., Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—A,G,M  
 Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Ia.—A,K  
 Color TV Inc., 973 E. San Carlos Ave., San Carlos, Calif.—A  
 Colortone TV Co., 238 William St., New York 38, N.Y.—A  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—A  
 Consolidated Productions, Bldg. 9, Broward Int'l Airport, Ft. Lauderdale, Fla.—A,K

Cook Labs., Route 2, Stamford, Conn.—M  
 Coronet Radio & TV, 1451 E. 27th St., Brooklyn 10, N.Y.—A  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,C,F,G,J,K,M,N  
 Crown Eng'g., 3821 Commercial N.E., Albuquerque, N.M.—G,P  
 Curtiss Wright Corp., Electronics Div., 631 Central Ave., Carlstadt, N.J.—A  
 Dade Bros., Old County Rd., Mineola, L.I., N.Y.—P  
 Dean Electronics Co., 35 5th Ave., Brooklyn 17, N.Y.—A,I  
 Decade Instrument Co., Box 153, Caldwell, N.J.—P  
 Denrad Mfg. Co., 310 W. Woodward St., Denison, Tex.—A,G,I,J,K,L,N,P  
 Diatron Co., 3327 Dixie Dr., Houston 21, Tex.—M  
 Dubrow, Devel. Co., 235 Penn. St., Burlington, N.J.—A,C,F,G,J,K,N,P  
 DUMONT LABS., INC., ALLEN B., INSTRUMENT DIV., 760 Bloomfield Ave., Clifton, N.J.—P  
 DUMONT LABS., INC., ALLEN B., 2 Main Ave., Passaic, N.J.—A,J,K  
 Edin Co., 207 Main St., Worcester, Mass.—M  
 Edu-Craft Corp., 150-45 12th Ave., Whitestone, N.Y.—A,I  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—P  
 Electromatic Mfg. Corp., 88 University Pl., New York 3, N.Y.—A  
 Electro-Mechanical Research, 64 Main St., Ridgefield, Conn.—P  
 Electron Enterprises, 6917-21 W. Stanley Ave., Berwyn, Ill.—A  
 Electronic Eng'g. Co., 362 W. Bowery St., Akron 7, Ohio—A,J,K,L,M  
 Electronic Research Co., 11550 39 St., N.E., Seattle 55, Wash.—A,G,P  
 Electrosonic Spec., 7230 Clinton Rd., Upper Darby, Pa.—A  
 Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—A  
 Electro Vision Lab., 4227 Francis Lewis Blvd., Bayside 61, N.Y.—A  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—A  
 Elk Electronic Labs. 333 W. 52 St., New York 19, N.Y.—A,L,P  
 El-Rad Mfg. Co., 2800 W. Cullom, Chicago 18, Ill.—A  
 El-Tronics, Inc., 5th & Noble Sts., Phila. 23, Pa.—A,F,P  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A,F,P  
 Empire State Labs., 2608 Merrick Rd., Bellmore, Long Island, N.Y.—A,P  
 Eng'g. Research & Devel. Co., Addison, Ill.—A  
 Eng'g. Research Assoc., Div. Remington Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—L,M,P  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—A,E,K,N  
 Erco Radio Lab., Stewart Ave., Garden City, N.Y.—G  
 Erwood Inc., 1770 W. Berteau Ave., Chicago 13, Ill.—A  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,F,G,J,L,M,N,P  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—A,F,G,L,M  
 FAIRCHILD RECORDING EQUIP. CORP., 154th St. & 7th Ave., Whitestone, N.Y.—A,C,G,M  
 Farmers Eng'g. & Mfg. Co., Irwin, Pa.—A  
 Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—A  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,M  
 Fidelity Amplifier Co., 703 W. Willow St., Chicago 14, Ill.—A,I  
 Fisher Radio Corp., 45-41 Van Dam St., Long Island City 1, N.Y.—A,M  
 Fluke Eng'g. Co., John, 1111 W. Nickerson St., Seattle 99, Wash.—A  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—A,M,N,P  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—A

### THE PRODUCT FINDING INDEX

In addition to being listed under 99 major group headings, the more than 1800 product categories are also listed alphabetically in the Product Finding Index starting on page 197. The group section number and code letter next to each item in the Index refers to the 99 major groups. Starting on this page, manufacturers are listed under each group with code letters after their names to indicate the products they make.

Example: In Product Finding Index, cathodes are listed under "c" and coded 96 N. In Product Listings, these same cathodes are listed in Section 96 —Tube Parts—Code N.











#### 4—AMPLIFIERS, TELEVISION

- Amplifiers, isolation ..... A
- Amplifiers, keying ..... B
- Amplifiers, limiting ..... C
- Amplifiers, line ..... D
- Amplifiers, mixing ..... E
- Amplifiers, monitoring ..... F
- Amplifiers, montage ..... G
- Amplifiers, remote ..... H
- Amplifiers, sweep ..... I
- Amplifiers, television ..... J

Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—H,J  
 Airtronix Devel. Corp., 20 W. 22 St., New York 10, N.Y.—E  
 Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio—J  
 Allied Allegri Machine Co., 141 River Rd., Nutley 10, N.J.—E  
 Allied Eng'g. Div., Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—B,C,E,F,H  
 Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.—E  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—D,F  
 American Communications Corp., 306 Broadway, New York 7, N.Y.—F,J  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—E  
 Applegate & Co., C. J., 1816 Grove St., Boulder, Colo.—A  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—C,D,E,F  
 Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N.J.—J  
 Baughman Co., E. J., 350 S. Central, Los Angeles 13, Calif.—J  
 Bell TV, Inc., 254 W. 54th St., New York 19, N.Y.—J  
 BLONDER-TONGUE LABS., INC., 526-536 North Ave., E., Westfield, N.J.—D,J  
 Boehme Inc., H. O., 915 Broadway, New York 10, N.Y.—B  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—B,C,D,E,F,H  
 Calbest Eng'g. & Electronics Co., 828-830 N. Highland Ave., Hollywood 38, Calif.—J  
 Carad Corp., 93 Leland Ave., San Francisco 28, Calif.—H  
 C.G.S. Labs. Inc., 391 Ludlow St., Stamford, Conn.—H  
 CINEMA ENG'G. CO., DIV. AEROVOX CORP., 1510 W. Verdugo Ave., Burbank, Calif.—D  
 Collins Radio Co., 855 35 St. N.E., Cedar Rapids, Iowa—F  
 Colortone TV Co., 238 William St., New York 38, N.Y.—J  
 Consolidated Productions, Bldg. 9, Broward Int'l. Airport, Ft. Lauderdale, Fla.—F  
 Coronet Radio & TV Corp., 1451 E. 27th St., Brooklyn 10, N.Y.—J  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kans.—B,C,D,E,F  
 Crown Eng'g., 3821 Commercial N.E., Albuquerque, N.M.—D  
 Decade Instrument Co., Box 153, Caldwell, N.J.—I  
 Delta Electronics, Inc., Div. of Electronic Indicator Corp., 259 Green St., Brooklyn 22, N.Y.—J  
 Denrad Mfg., Co., 310 W. Woodard St., Denison, Tex.—D,E,F,H  
 Dubrow Devel. Co., 235 Penn. St., Burlington, N.J.—B,C,D,E,F,H  
 DUMONT LABS., INC., ALLEN B., TV TRANSMITTER DIV., 1500 Main Ave., Clifton, N.J.—J  
 DUMONT LABS. INC., ALLEN B., 2 Main Ave., Passaic, N.J.—J  
 Eldico of N.Y., Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—B  
 Electronic Eng. Co., 362 W. Bowery St., Akron 7, Ohio—E,F  
 Electronic Research Co., 11550 39 St., N.E., Seattle 55, Wash.—D  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—J  
 El-Tronics, Inc., 5th & Noble Sts., Philadelphia 23, Pa.—C  
 Emerson Electric Mfg., Co., 8100 Florissant Ave., St. Louis 21, Mo.—C  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,B,F,H  
 Erco Radio Labs., Stewart Ave., Garden City, N.Y.—B,D  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—B,C,D,H,I,J  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—C,D  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7 Ave., Whitestone, N.Y.—D  
 Fidelity Amplifier Co., 703 W. Willow St., Chicago 14, Ill.—B  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—H,J  
 Frutchey, M. P., P.O. Box 28, Hackettstown, N.J.—H  
 Garod Radio Corp., 70 Washington St., Brooklyn 1, N.Y.—J  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—C,D,E,F,H  
 General Communication, P. O. Box 169, Fort Atkinson, Wis.—D,E,F,G,J



G. & M. Equip. Co., 7315 Varna Ave., N. Hollywood, Calif.—B  
 Grayburne Corp., 4-6 Radford Pl., Yonkers, N.Y.—J  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—H  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—C,H  
 Idea, Inc., 7900 Pendleton Pike, Indianapolis 26, Ind.—J  
 Industrial TV, 369 Lexington Ave., Clifton, N.J.—C,J  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—C,D,F  
 Int'l. Research Assoc., 2221 Warwick Ave., Santa Monica, Calif.—F,J  
 Int'l. Telemeter Corp., 2000 Stoner Ave., Los Angeles 25, Calif.—J  
 Jerrold Electronics Corp., 26th & Dickinson Sts., Philadelphia 46, Pa.—J  
 Johnson Labs., Div. of Aladdin Industries, Inc., Willard Rd., Norwalk, Conn.—J  
 Kane Electronics Corp., 81 Willoughby St., Brooklyn 1, N.Y.—J  
 Kinevox, Inc., 116 S. Hollywood Way, Burbank, Calif.—E  
 LaPointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—J  
 Lynmar Engineers, 1432 N. Carlisle St., Phila. 21, Pa., E,J  
 Magna Electronics, Inc., 9810 Anza Blvd., Inglewood, Calif.—E  
 Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y.—H  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—C,E,F,J  
 Maurer, Inc., J. A., 37-01 31 St., Long Island City 1, N.Y.—E  
 Maxson Corp., W. L., 460 W. 34 St., New York 1, N.Y.—B,C,E,F,H,I,J  
 Medcraft Electronic Corp., 41-41 24 St., Long Island City 1, N.Y.—H  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—D,E  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—E,F,H  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—D  
 Neptune Electronic Co., 433 Broadway, New York 13, N.Y.—F  
 Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.—H  
 Nester Eng'g. Co., 24 Chestnut St., Rutherford, N.J.—H  
 Oberlin, Ltd., 6411 Hollywood Blvd., Hollywood 28, Calif.—C,D,E,F,H  
 O'Brien Electric Corp., 6514 Santa Monica Blvd., Hollywood 38, Calif.—D,E  
 Oregon Corveck Co., 1005 N.W. 16 Ave., Portland, Ore.—J  
 Orthon Corp.—196 Albion Ave., Paterson, N.J.—D,E,H  
 Pilot Radio Corp., 37-06 36 St., Long Island City 1, N.Y.—J  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—J  
 Potter Instrument, 115 Cutter Mill Rd., Great Neck, N.Y.—B  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—B,C,D,H  
 PRESTO RECORDING CORP., P.O. Box 500, Paramus, N.J.—C,E  
 Radar-Electronics Inc., 229 W. 28th St., New York 1, N.Y.—C,J  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., Front & Cooper Sts., Camden 2, N.J. C,D,F,J  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—C,F  
 Resdel Eng'r., 2351 Riverside Dr., Los Angeles 39, Calif.—H  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—I,J  
 Scott Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—F,H  
 Shrader Mfg., Co., 2803 M. St., N. W., Washington 7, D.C.—C,D,E,F  
 Simpson Mfg. Co., Mark—32-38 49 St., Long Island City 3, N.Y.—D,E,H  
 Smith-Meeker Eng'g. Co., 159 Chambers St., New York 7, N.Y.—D,E  
 Sonar Radio Corp.—3050 W. 21 St., Brooklyn 24, N.Y.—C,D,E  
 Sparton Radio TV, 2400 E. Ganson St., Jackson, Mich.—C,J  
 Spencer-Kennedy Labs., 186 Mass Ave., Cambridge 39, Mass.—J  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—C,D,E,F  
 Stromberg-Carlson Co., Rochester 3, N.Y.—D,E,F,H,J  
 TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—C,G,J  
 Telectro Industries Corp., 35-17 37 St., Long Island City 1, N.Y.—D,E,F,H  
 Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland 3, Ohio—F  
 TURNER CO., 909 17 St., N.E. Cedar Rapids, Iowa—J

Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City, N.J.—H  
 Univex Corp., 102 Warren St., New York 7, N.Y.—E  
 U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—E,F,H  
 Varian Associates, 990 Varian St., San Carlos, Calif.—J  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—F  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—H,J  
 Wickes Eng'r. & Const. Co., 12 St. & Ferry Ave., Camden, N.J.—B,C,D,F  
 Willys-Overland Motors, Inc., Electronics Div., 6225 Benore Rd., Toledo, Ohio—D  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—E

#### 5—ANALYZERS

- Analyzers, audio-amplifier ..... A
- Analyzers, capacitor ..... B
- Analyzers, circuit ..... C
- Analyzers, coincidence ..... D
- Analyzers, color ..... E
- Analyzers, frequency ..... F
- Analyzers, gas ..... G
- Analyzers, harmonic ..... H
- Analyzers, intermodulation ..... I
- Analyzers, internal combustion ... U
- Analyzers, magnetic ..... J
- Analyzers, microwave ..... K
- Analyzers, noise ..... L
- Analyzers, radar ..... M
- Analyzers, servo ..... N
- Analyzers, spectrum ..... O
- Analyzers, surface ..... P
- Analyzers, ultrasonic ..... Q
- Analyzers vibration ..... R
- Analyzers, video ..... S
- Analyzers, waveform ..... T

Advance Electronics Co., P. O. Box 394, Passaic, N.J.—C  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—A,B,C,G,J,R  
 AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—B  
 Airborne Electronics Co., Hanger 6 Metropolitan Airport, Van Nuys, Calif.—O  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—A  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—I  
 American Electronics Corp., 2040 Colorado Santa Monica, Calif.—I  
 American Electroneering Corp., 2040 Colorado Ave., Santa Monica, Calif.—F,I  
 American Optical Co., Instrument Div., Box A, Buffalo 15, N.Y.—E,O  
 Ansley Electronics, Inc., 85 Tremont St., Meriden, Conn.—M,O  
 Applied Physics Corp., 362 W. Colorado, Pasadena 1, Calif.—G  
 Applied Physics Corp., 362 W. Colo. St., Pasadena 1, Calif.—G  
 Arenberg Ultrasonic Lab., 94 Green St., Jamaica Plain 30, Mass.—G  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—D  
 Atomlab, Inc., 489 5 Ave., New York 17, N.Y.—D  
 Audio Instrument Co., 133 W. 14th St., New York 11, N.Y.—I  
 Audio & Video Prod. Corp., 730 Fifth Ave., N.Y. 19, N.Y.—D,F,I,J,L,M,N,O,Q,R,S,T  
 Back Video Corp., F.G., 500 5 Ave., New York 36, N.Y.—S  
 Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio—G  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—A,F,I,H,L  
 Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—O  
 Beckman & Whitley, Inc., 985 San Carlos, San Carlos, Calif.—O  
 Benson-Lehner Corp., 2340 Sawtelle Blvd., Los Angeles 64, Calif.—T  
 Berkshire Labs., 586 Beaver Pond Rd., Lincoln, Mass.—J  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—F,I,K,M,O  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—B,C,D,F,G,H,I,J,K,L,M,N,P,Q,R,S,T,U  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—A,F,L,P,R  
 Calidyne Co., 751 Main St., Winchester, Mass.—R  
 Cambridge Instrument Co., Grand Central Terminal, New York 17, N.Y.—G  
 Canoga Corp., 5955 Sepulveda Blvd., Van Nuys, Calif.—O  
 CBS-Columbia Inc., 170 53rd St., Brooklyn 32, N.Y.—B,S  
 Central Scientific Co., 1700 Irving Pk. Rd., Chicago 13, Ill.—G  
 Century Geophysical Corp., 3406 W. Washington 6, Los Angeles 18, Calif.—F,N,Q,R















Lorain Products Corp., 1122 F St., Lorain, Ohio—O  
 Lysco, 1401 Clinton St., Hoboken, N.J.—O  
 MAGNAVOX CO., Fort Wayne 4, Ind.—D,F  
 magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—L  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—E,F,O,Q  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—O  
 McColpin-Christie Corp., 3410 W. 67 St., Los Angeles 43, Calif.—L,O,Q,U  
 Mission-Western Engineers, Inc., 132 W. Colo. St., Pasadena 1, Calif.—P,U  
 Modelectric Prod. Corp., Asbury Park, N.J.—T  
 Motor Generator Corp., Hobart Sq., Troy, Ohio—M,P  
 Motorresearch Co., 1600 Junction Ave., Racine, Wisc.—M,P  
 National Carbon Co., 30 E. 42 St., New York 17, N.Y.—B,D,E  
 Nickel Cadmium Battery Corp., Pleasant St., Easthampton, Mass.—G,I,J,K  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—O  
 Olin Industries, 275 Winchester Ave., New Haven, Conn.—D,E  
 Onan & Sons Inc., D. W., University Ave., S. E. at 25, Minneapolis 14, Minn.—M,Q  
 Opad-Green Co., 71 Warren St., New York 7, N.Y.—L,O,Q  
 PAR Products Corp., 926 N. Citrus Ave., Hollywood 38, Calif.—K  
 Perkins Eng'g. Corp., 345 Kansas St., El Segundo, Calif.—L,O  
 Perma-Power Co., 4727 N. Damen Ave., Chicago 25, Ill.—O  
 Pioneer Gen-E-Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.—M,P,Q  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—A,M  
 Power Equipment Co., 5740 Nevada, E. Detroit 34, Mich.—L,O  
 Pratt, Albert, 1939 N. 18 St., Milwaukee 5, Wisc.—U  
 Precision Associates, 354 Cumberland St., Brooklyn 17, N.Y.—U  
 Radar-Electronics Inc., 229 W. 28th St., New York 1, N.Y.—H,I,K,M,Q,R  
 Radiart Corp., 3455 Vega Ave., Cleveland 13, Ohio—R  
 RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—D  
 Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—U  
 RADIO RECEPTOR CO., 84 N. 9 St., Brooklyn 11, N.Y.—O  
 Rapid Electric Co., 2881 Middletown Rd., Bronx 61, N.Y.—O  
 Ray-O-Vac Co., 212 E. Washington Ave., Madison 10, Wisc.—D,E,F  
 RAYTHEON MFG. CO., Waltham 54, Mass.—L,O,P,R  
 Regulator Eng'g. & Devel. Co., 11545 W. Jefferson Blvd., Culver City, Calif.—O  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—O,L  
 Schauer Mfg. Co., 4500 Alpine Ave., Cincinnati 36, Ohio—L,O,Q  
 Sightmaster of California Co., Gillespie Airport, Santee, Calif.—C  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—U  
 Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—T  
 Smith-Meeker Eng'g. Co., 157 Chambers St., New York, 7, N.Y.—O  
 Sonotone Corp., Elmsford, N.Y.—G  
 Specialty Battery Co., 212 E. Washington Ave., Madison 10, Wisc.—D,K,H,I,J  
 Standard Electric Time Co., 119 Logan St., Springfield, Mass.—G,O  
 STANDARD TRANSFORMER CORP., 3580 Elston Ave., Chicago 18, Ill.—O  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—E,O  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,D,E,F,G,H,I,J,K,O  
 Transformer Technicians, 2608 N. Cicero Ave., Chicago 39, Ill.—O  
 Union Spring & Mfg., 1057 Summit Ave., Jersey City 7, N.J.—L,O  
 Universal Electronics Co., 2012 S. Sepulveda Blvd., Los Angeles 25, Calif.—L,O  
 Vacolite Co., 3003 N. Henderson St., Dallas 6, Texas—E,F  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—U  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—O,Q  
 Whitaker Cable Corp., 1301 Burlington Ave., N. Kansas City 16, Mo.—T  
 Wilcox Research Corp., 340 N. La Brea Ave., Los Angeles 36, Calif.—O  
 Willard Storage Battery Co., 1220 Huron Rd., Cleveland, Ohio—D,J,K,O,Q,U  
 WINCHARGER CORP., E. 7 at Division St., Sioux City 2, Iowa—M,P,S

**Manuals, test equipment . . . . . C**  
**Manuals, tube . . . . . D**  
**Reference books . . . . . E**  
**Reports & digests . . . . . F**

Ahrendt Instrument, 4910 Calvert Rd., College Park, Md.—A  
 Ampere Electronic Corp., 230 Duffy Ave. Hicksville, L.I., N.Y.—D  
 Audel Publishers, 49 W. 23rd St., New York, N.Y.—E  
 Benson-Lahner Corp., 2340 Sawtelle Blvd., Los Angeles 64, Calif.—F  
 BOGARÉ MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—A,C,D,E  
 Brooks Radio & TV, 84 Vesey St., New York 7, N.Y.—A,B,E  
 Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles 34, Calif.—A,B  
 Bruning Co., Charles, 4700 Montrose Ave., Chicago 41, Ill.—A,E  
 Caldwell-Clements Manuals Corp., 480 Lexington Ave., New York 17, N.Y.—A,B,C,D,E  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles, Calif.—A,C  
 C.G.S. Laboratories, 391 Ludlow St., Stamford, Conn.—A  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—A  
 Delco-Remy Div., General Motors Corp., P. O. Box 640, Anderson, Ind.—B  
 Dover Publications Inc., 1780 Broadway, New York, N.Y.—E  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—A,B,C  
 DUMONT LABS., INC., ALLEN B., Instrument Div., 760 Bloomfield Ave., Clifton, N.J.—A,C,D  
 Eldico of N.Y., Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—A  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—A,F  
 Emerson Electric Mfg., 8100 Florissant, St. Louis 21, Mo.—A,B,C  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B  
 Film Research Associates, 150 E. 52 St., New York 22, N.Y.—E,F  
 Fretco, Inc., 1041 Forbes St., Pittsburgh 19, Pa.—E  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—C  
 GENERAL ELECTRIC CO., Tube Dept., 1 River Rd., Schenectady 5, N.Y.—D  
 GENERAL ELECTRIC CO., Radio-TV Dept., Electronics Park, Syracuse, N.Y.—B  
 Goldsmith Bros. Smelting & Refining Co., 111 N. Wabash Ave., Chicago 2, Ill.—E  
 GULTON MFG CORP., Metuchen, N.J.—A,C,F  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—A  
 Harper & Bros., 49 E. 33 St., New York N.Y.—A,E  
 Macmillan Co., 60 5th Ave., New York 11, N.Y.—A,B,C,E  
 Magne-Pulse Corp., 140 Nassau St., New York 38, N.Y.—A,B,C  
 MALLORY & CO., P. R., 3029 E. Washington, Indianapolis 6, Ind.—A,B,E,F  
 Maxson Corp., W. L., 460 W. 34 St., New York 1, N.Y.—A,B,C,F  
 McGraw-Hill Book Co., 330 W. 42 St., New York 36, N.Y.—A,E  
 Micro-Circuits Co., New Buffalo, Mich.—A  
 Opticon Research, Inc., 1374 Massachusetts Ave., Cambridge 38, Mass.—A  
 Opto Eng'g. Co., 3406 W. Washington Blvd., Los Angeles 18, Calif.—A,B  
 Pellegrini & Cudahy, 41 E. 5th St., New York 22, N.Y.—E  
 Pitman Publishing Corp., 2 W. 45th St., New York, N.Y.—E  
 Prentice-Hall Inc., 70 Fifth Ave., New York, N.Y.—A,E  
 RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—D  
 Recker Co., Joseph, 140 Nassau St., New York 38, N.Y.—A,B,C  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—A,B  
 Rider Inc., John F., 480 Canal St., New York 13, N.Y.—B  
 Rinehart Books Inc., 232 Madison Ave., New York, N.Y.—E  
 ROBINSON AVIATION INC., Teterboro Air Terminal, Teterboro, N.J.—A  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—A,C  
 Sams & Co., Howard W., 2201 E. 46 St., Indianapolis 5, Ind.—B,F  
 Scientific Book Publishing Co., Vincennes, Ind.—A,E  
 Sightmaster of Calif., Gillespie Airport, Santee, Calif.—F  
 Southwestern Industrial Electronics, 2831 Post Oak Rd., Houston, Tex.—C  
 Special Effects & Equip. Inc., 418 W. 54th St., N.Y. 19, N.Y.—F  
 Supreme Publications, 3727 W. 13th St., Chicago 23, Ill.—E  
 Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—A,F  
 Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—A,B,C,F  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—A,B,C,D,E,F  
 United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.—A

United Catalog Publishers, 110 Lafayette St., New York 13, N.Y.—E  
 UNIVERSITY LOUDSPEAKERS, 80 S. Ken-sico Ave., White Plains, N.Y.—E  
 U. S. Eng'g. Co., 520 Commercial St., Glendale 3, Calif.—A  
 Van Nostrand Co., 250 4th Ave., New York, N.Y.—E  
 Welch Scientific Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.—E  
 White Industries, Inc., 421 W. 54 St., New York 19, N.Y.—A,B,E  
 Wickes Eng'g. & Const. Co., 12th St. & Ferry Ave., Camden, N.J.—A,B  
 Wiley & Sons, Inc., John, 440 Fourth Ave., New York 16, N.Y.—A,E

**12—CABINETS, RACKS & PANELS**

**Bins . . . . . A**  
**Cabinets, metal . . . . . B**  
**Cabinets, plastic . . . . . C**  
**Cabinets, wood . . . . . D**  
**Cases, portable . . . . . E**  
**Chassis . . . . . F**  
**Felt . . . . . G**  
**Film finishes . . . . . H**  
**Instrument housings . . . . . I**  
**Leather handles . . . . . J**  
**Leatherette . . . . . K**  
**Mounting accessories . . . . . L**  
**Panels . . . . . M**  
**Racks . . . . . N**  
**Transformer Cases . . . . . P**  
**Trays . . . . . O**

Abalon Precision Mfg. Corp., 540 Casanova St., Bronx 59, N.Y.—B,E,F,I,L,M,N  
 Acromark Co., 9 Morrell St., Elizabeth 4, N.J.—M  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—L  
 Ahrendt Instrument Co., 4910 Calvert Rd., College Park, Md.—B,M  
 Ainslie Electronic Products, Inc., 312 Quincy Ave., Quincy, Mass.—B,F,M,N  
 Airborne Electronics Co., Hangar 6 Metropolitan Airport, Van Nuys, Calif.—M  
 A. J. F. Industries, 852 Monroe St., Brooklyn 21, N.Y.—P  
 Airpax Products Co., P. O. Box 137, Baltimore 20, Md.—P  
 Alamo Electronics Corp., 105 W. Romana St., San Antonio, Tex.—D,I  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton, Mass.—B,E,F,L,M,N,P  
 Allied Engraving & Stamping Co., 161 Ellicott St., Buffalo 3, N.Y.—M  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—M  
 Allis Co., Louis, 427 E. Stuart St., Milwaukee 7, Wisc.—B,M  
 ALTEC LANSING CORP., 9356 Santa Monica Blvd., Beverly Hills, Calif.—B,D,M,N  
 American Electroneering Corp., 2040 Colo. Ave., Santa Monica, Calif.—B,E,F,I,M,N,O  
 American Wood Working Co., 1682 N. Lowell Ave., Chicago 39, Ill.—D,E,L,M,N,O  
 Anaconda Wire & Cable Co., 25 Broadway, New York 4, N.Y.—O  
 Apex Coated Fabrics Co., 12 E. 22nd St., New York 10, N.Y.—K  
 Argos Products Co., 310 Main St., Genoa, Ill.—D,E,I  
 Art-Lloyd Metal Products Corp., 2973 Cropsey Ave., Brooklyn 14, N.Y.—B,D,E,F,I,M,N,O  
 Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.—M  
 Audio & Video Products Corp., 730 5th Ave., N.Y. 19, N.Y.—M,N,O  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—F  
 Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—B,F,M  
 Baer Co., N.S., 1 Montgomery St., Hillside 5, N.J.—M  
 Barry Corp., 761 Pleasant St., Watertown 72, Mass.—N  
 Baughman Co., E. J., 350 S. Central, Los Angeles 13, Calif.—B,I,N  
 Bennett Mfg. Co., Alden, N.Y.—B,H,I  
 Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.—E  
 Bogan Co., David, 29 9th Ave., New York 14, N.Y.—D  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—F,M  
 Boyle Metalcraft Corp., 150 Sullivan St., Brooklyn 31, N.Y.—B  
 Brillhart Plastic Corp., Box 31, Old Country Rd., Mineola, L.I., N.Y.—C,I  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—D  
 Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles, Calif.—L  
 Buck Eng'g. Co., 37 Marcy St., Freehold, N.J.—B,F,N,M  
 Bucks County Enterprises, Quakertown, Pa.—A,B,E,M,N,O

**11—BOOKS AND DATA SERVICE**

**Manuals, engineering . . . . . A**  
**Manuals, maintenance . . . . . B**



BUD RADIO INC., 2118 E. 55 St., Cleveland 3, Ohio—B,E,F,N,M,O  
 Cameron Craft, 924 Brockhurst St., Oakland 8, Calif.—D,E,M,N,O  
 Castlewood Mfg. Co., 1430 S. 12 St., Louisville 10, Ky.—D,I  
 Chicago Electronic Eng. Co., 3223 Armitage Ave., Chicago 47, Ill.—P  
 Churchill Lighting Corp., 344 Franklin St., Melrose 76, Mass.—B,E,F,M,N,O  
 CINEMA ENG'G. Co., Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—F, L,M,N  
 Color Plastics, Inc., 247 Atlantic Ave., Boston 10, Mass.—C,N,O  
 Columbia Metal Box Co., 260 E. 143 St. New York 51, N.Y.—B,F,I,M  
 Consolidated Molded Products Corp., 309 Cherry St., Scranton 2, Pa.—C,E  
 Continental Textile & Supply Co., 4245 W. Armitage Ave., Chicago 39, Ill.—E,K  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—B,E,F,L,M,N,O  
 Croname Inc., 3701 Ravenswood Ave., Chicago 13, Ill.—B,E,F,M  
 Cutler Metal Products Co., 1025 Line St., Camden 3, N.J.—A,B,E,F,I,L,M,N,O  
 Daniels, Inc., C. R., Daniels, Mr.—E  
 Delco Radio Div., General Motors Corp., Kokomo, Ind.—F  
 Daven Co., 191 Central Ave., Newark 4, N.J.—D  
 Dietz Co., Henry G., 12-16 Astoria Blvd., L.I.C. 2, N.Y.—B,F,I,M  
 Dirigo Compass & Instrument Co., Boeing Field Airport, Seattle 8, Wash.—B,D,E,I,M  
 Doehmler Metal Furniture Co., 192 Lexington Ave., New York 16, N.Y.—B  
 Dolin Metal Products Inc., 315 Lexington Ave., Bklyn. 16, N.Y.—A,B,E,F,I,L,M,N,O  
 DUMONT LABS. INC., Allen B., 750 Bloomfield Ave., Clifton, N.J.—L  
 Edo Corp., 1310 111th St., College Point 56, N.Y.—B  
 Electro-Craft Inc., 68 Jackson St., Stamford, Conn.—F,L,N  
 Electronic Eng. Co., 362 W. Dowery St., Akron 7, Ohio—B,D,F,M,N  
 Electronic Transformer Co., 207 W. 25 St., New York, N.Y.—P  
 Ellar Woodcraft Corp., 431 W. 28 St., New York 1, N.Y.—  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—D  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—F,I,M  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—P  
 Falstrom Co., 53 Falstrom Ct., Passaic, N.J.—F,I,M  
 Federal Shock Mount Corp., 1077 Intervale Ave., Bronx, N.Y.—O  
 Feiner & Sons, Inc. P., 522 W. 45 St., New York City 36, N.Y.—E,F,I,M,N,O  
 Felters Co., 210 S. St., Boston 11, Mass.—G  
 Finn & Co., T. R., 333 Jackson Ave., New York 54, N.Y.—L  
 FORMICA CO., 110 St., S. Boston 27, Mass.—B,E,F,M,N,O  
 GATES RADIO CO., 123 Hampshire St., Quincy Ill.—B,D,E,F,M,N,O  
 Gadgets, Inc., 3629 N. Dixie Dr., Dayton 5, Ohio—I,M  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—A,D,K,L,M  
 Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.—C  
 General Communications, P. O. Box 169, Fort Atkinson, Wisc.—B,M  
 G & H Wood Products Co., 75 N. 11 St., Brooklyn 11, N.Y.—D  
 Grant Pulley & Hardware Co., 3-87 White-stone Parkway, Flushing, N.Y.—L,M,N,O  
 Hamilton Electronics Corp., 2726 Pratt Ave., Chicago 45, Ill.—B,E,F,M,N  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—B,E,P  
 Hays Corp., E. 8 St., Michigan City, Ind.—M  
 Hawley Products Co., 335 N. 6 St., St. Charles, Ill.—E  
 Helder Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J.—B,F,I,N,M,O,P  
 HOUSTON FEARLESS CORP., 11801 W. Olympic Blvd., Los Angeles 64, Calif.—A,B,D,F,M,N,O  
 HUDSON TOOL & DIE CO., 412 S. 14 St., Newark 7, N.J.—P  
 Independent Mfg. Co., 5 Belleview Ave., E. Riverton, N.J.—F,M,N,O  
 Industrial Transformer Corp., Gouldsboro, Pa.—P  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., L.I.C. 1, N.Y.—B,E,F,H,I,L,M,N  
 Kane Electronics Corp., 81 Willoughby St., Brooklyn 1, N.Y.—B,D,M,N  
 Karp Metal Products Co., 211 63 St., Brooklyn, N.Y.—B,E,F,I,M,N,O  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—N  
 Kent Metal Mfg. Co., 490 Johnson Ave., Brooklyn 37, N.Y.—B,E,F,I,M,N,O  
 Kilgen Aircraft, 4632 W. Florissant Ave., St. Louis 15, Mo.—D,M  
 Kirk & Blum Mfg. Co., 3120 Ferrer, Cincinnati 9, Ohio—A,B,F,I,M,N,O  
 Kolton Electric Mfg. Co., 123 N.J. & R.R. Ave., Newark 5, N.J.—B,F  
 Laidman & Co., 1308 N. Halsted St., Chicago 22, Ill.—G

LANGEVIN MFG. CORP., 37 W. 65 St., New York 23, N.Y.—B  
 Lansing Sound Inc., James B., 2439 Fletcher Dr., Los Angeles 39, Calif.—D  
 La Pointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—B  
 Lavoie Labs. Inc., Morganville, N.J.—E,F  
 Lee Electric & Mfg. Co., 2806 Clearwater St., Los Angeles 39, Calif.—B,M,N  
 Lorentzen, Inc., H.K., 391 W. Broadway, New York 12, N.Y.—B,E,F,I,L,M,N  
 Lynmar Engineers, 1432 N. Carlisle St., Phila. 21, Pa.—F  
 Malkin-Illion Co., 396 Coit St., Irvington 11, N.J.—B,E,F,M,N  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—B,M,N,O  
 Miller Electric Co., P. O. Box 1827, Jacksonville, Fla.—B,C,D,F,M,N,O  
 Minute Man Products, Inc., 430 E. 102 St., New York 29, N.Y.—B,F,L,O  
 Molding Corp. of America, 40 Church St., Pawtucket, R.I.—C  
 Motiograph, Inc., 4431 W. Lake St., Chicago 24, Ill.—M,N  
 Muckle Mfr. Co., Owatonna, Minn.—B  
 Multi-Metal Wire Cloth Co., 1350 Garrison Ave., New York 59, N.Y.—B,E,F,I,M,N,O  
 MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—M  
 Neal Feay Co., 427 Olive St., Santa Barbara, Calif.—M  
 Nestor Eng'g. Co., 24 Chestnut St., Rutherford, N.J.—F,M  
 Neumade Products Corp., 330 W. 42 St., New York 36, N.Y.—B,H,N  
 New Products Co., 1071 E. 54 St., Indianapolis 20, Ind.—M,O  
 Northeastern Eng'g. Inc., So. Bedford St., Manchester, N.H.—B,E,F,M,N  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—M,N  
 Oberline Ltd., 6411 Hollywood Blvd., Hollywood 28, Calif.—D  
 O'Brien Electric Corp., 6514 Santa Monica Blvd., Hollywood 38, Calif.—B,E,F,M,N,O  
 Olympic Metal Products, P.O. Box 71, Phillipsburg, N.J.—E,P

PAR-METAL PRODUCTS CORP., 32-62 49 St., L.I.C. 3, N.Y.—B,E,F,M,N  
 Peerless Electrical Products, Div. Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—P  
 Pentron Corp., 221 E. Cullerton Ave., Chicago 16, Ill.—E  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—B,I  
 Plasticraft Products Co., 1 Station Plaza, West Nyack, N.Y.—M  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—A,B,E,F,I,L,M,N,O  
 Poray, Inc., 3369 W. Grand Ave., Chicago 51, Ill.—B,F,I,M  
 Pratt, Albert, 1939 N. 18 St., Milwaukee 5, Wisc.—B,E,I  
 Premax Products Div., Chisholm-Ryder Co., 5301 Highland Ave., Niagara Falls, N.Y.—L  
 Premier Metal Products Co., 3160 Webster Ave., Bronx 67, N.Y.—B,F,I,M,N  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—F,M,N  
 RADIO CORP. OF AMERICA, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J.—B  
 Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—C  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—D  
 Radio & Television Inc., Brunswick Div., 119 W. 57 St., New York 19, N.Y.—D  
 Railway Communications, Inc., Raywood, Mo.—N,P  
 Reister & Thesmacher Co., 1526 W. 25 St., Cleveland 13, Ohio—B,F  
 Rek-O-Kut Co., 38-01 Queens Blvd., L.I.C. 1 N.Y.—D,E  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—C,I  
 Research Instrument Co., 233 Broadway, New York 7, N.Y.—A,B,C,F,I,M,N,O  
 Richardson Co., Lockland, Cincinnati 15, Ohio—C,I  
 Rigidized Metals, Corp., 658 Ohio St., Buffalo 3, N.Y.—M  
 River Edge Industries, 5 River Edge Rd., River Edge, N.J.—D,F,I  
 Rogers Corp., Goodyear, Conn.—M  
 Servo Corp. of America, 2020 Jericho Turnpike, New Hyde Park, L.I., N.Y.—B  
 Sherron Electronics, 1201 Flushing Ave., Brooklyn 6, N.Y.—F  
 Shura-Tone Products Inc., 440 Adelphi St., Brooklyn 38, N.Y.—D,E  
 Skydyme Inc., River Road, Port Jervis, N.Y.—B,E,I  
 South River Metal Products Co., 377 Old Bridge Turnpike, South River, N.J.—F  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Tex.—B,D,I  
 Specialty Assembling, 79 Clifton Pl., Brooklyn 38, N.Y.—B,D,E,L,M,N  
 Standard Electric Time Co., 119 Logan St., Springfield, Mass.—B,M  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—L,M,N,O  
 Standard Pressed Steel Co., Box 899, Jenkintown, Pa.—B  
 Suckle Electronics Co., 22 & Hayes Ave., Camden 5, N.J.—B,E,F,G,I,L,M,N,O  
 Tabet Mfg. Co., 254 W. Tazewell St., Norfolk 10, Va.—B,F,M  
 Tektronix, Inc., P. O. Box 831, Portland 7, Ore.—M  
 Thompson Clock Co., H.G., 38 Federal St., Bristol, Conn.—A,B,C,D,E,G,I,M,N,O  
 Transformer Engineers, 161 E. California St., Pasadena 1, Calif.—P  
 Transformer Metal Products Corp., 343 W. 26th St., New York, N.Y.—A,B,E,F,G,H,I,L,M,N,O,P  
 Transformer Technicians, 2608 N. Cicero Ave., Chicago 39, Ill.—P  
 Triad Portable Case Corp., 310 W. Lincoln Ave., Mount Vernon, N.Y.—E,K  
 Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif.—P  
 Universal Aviation Equip. Inc., 187 Lafayette St., New York 13, N.Y.—M  
 UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N.Y.—D  
 Univex Corp., 102 Warren St., New York 7, N.Y.—F  
 U. S. Plywood Corp., 55 W. 44 St., New York, N.Y.—D  
 U.S. Radium Corp., 535 Pearl St., New York 7, N.Y.—M  
 Utah Radio Products Co., 1123 E. Franklin St., Huntington, Ind.—B,D  
 Waldom Electronics, Inc., 911 N. Larrabee St., Chicago 10, Ill.—C  
 Wallach & Associates, 1532 Hillcrest Rd., Cleveland 18, Ohio—B  
 Wallace Mfg. Co., W. T., Peru, Ind.—D  
 Western Int'l. Co., 45 Vesey St., New York 7, N.Y.—B,F,M,N  
 Western Sound & Electric Labs., Inc., 805 S. 5 St., Milwaukee 4, Wisc.—B,M  
 White Industries, Inc., 421 W. 54 St., New York 19, N.Y.—B,F,M,N,P  
 White Rock Mfg. Co., White Rock, S.C.—D,E  
 Wright-Hepp Assoc., 138 West St., S. Hackensack, N.J.—P  
 Wright, Inc., 2233 University Ave., St. Paul 14, Minn.—B

## GREEK ALPHABET

name	capital	small
ALPHA	Α	α
BETA	Β	β
GAMMA	Γ	γ
DELTA	Δ	δ
EPSILON	Ε	ε
ZETA	Ζ	ζ
ETA	Η	η
THETA	Θ	θ
IOTA	Ι	ι
KAPPA	Κ	κ
LAMBDA	Λ	λ
MU	Μ	μ
NU	Ν	ν
XI	Ξ	ξ
OMICRON	Ο	ο
PI	Π	π
RHO	Ρ	ρ
SIGMA	Σ	σ
TAU	Τ	τ
UPSILON	Υ	υ
PHI	Φ	φ
CHI	Χ	χ
PSI	Ψ	ψ
OMEGA	Ω	ω

## 13—CAPACITORS, FIXED

Capacitors, air .....A  
Capacitors, ceramic .....B  
Capacitors, electrolytic dry .....C  
Capacitors, electrolytic wet .....D  
Capacitors, feed through .....E  
Capacitors, gas-filled .....F  
Capacitors, glass .....G  
Capacitors, industrial .....H  
Capacitors, metallized paper .....I  
Capacitors, mica .....J  
Capacitors, oil .....K  
Capacitors, paper .....L  
Capacitors, plastic dielectric .....M  
Capacitors, plug-in .....N  
Capacitors, polystyrene insulated .....O  
Capacitors, silvered mica .....P  
Capacitors, standard .....Q  
Capacitors, tantalum .....R  
Capacitors, temperature compensated .....S  
Capacitors, transmitting .....T  
Capacitors, vacuum .....U

AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—B,C,D,E,H,I,J,K,L,M,N,O,P,Q,S  
Allen-Bradley Co., 110 W. Greenfield Ave., Milwaukee 4, Wisc.—B  
American Condenser Co., 4410 N. Ravenswood Ave., Chicago, Ill.—C,D,L  
American Radionic Co., 33 Flatbush Ave., Brooklyn 17, N.Y.—K,L  
Ampere Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y.—U  
Arco Electronics, 103 Lafayette St., New York 13, N.Y.—B,E,J,L,P,Q  
Arnhold Ceramics, 1 E. 57 St., New York 22, N.Y.—B,E,J  
Asheville Schoonmaker Mica Co., Box 318, Newport News, Va.—B  
ASTRON CORP., 255 Grant Ave., East Newark, N.J.—C,H,I,K,L,M,O,Q  
Automatic Mfg., Corp., 65 Gouverneur St., Newark 4, N.J.—B,J,P  
Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—A,T  
Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—C,H,U  
Bendix Aviation Corp., Cincinnati Div., 203 W. Third St., Cincinnati 2, Ohio—O  
BERKSHIRE LABS., 586 Beaver Pond Rd., Lincoln, Mass.—N  
British Radio Electronics Ltd., 1 Thomas Circle, Washington 5, D.C.—P  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—B,C,D,J,L,Q  
Brown Electro-Measurement Corp., 4635 S. E. Hawthorne Blvd., Portland 15, Ore.—Q  
BUD RADIO INC., 2118 55 St., Cleveland 3, Ohio—A  
Burnell & Co., 45 Warburton Ave., Yonkers, N.Y.—M  
CENTRALAB, DIV. GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wisc.—B,E,H,Q,S,T  
Chicago Condenser Corp., 3255 W. Armitage Ave., Chicago 47, Ill.—E,H,K,L,M  
Condenser Products Co., 7517 N. Clark St., Chicago 26, Ill.—G,H,K,M,N,O,Q,S,T  
Continental Electronics Mfg. Co., 4212 S. Bruckner Blvd., Dallas 10, Texas—K  
Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., South Plainfield, N.J.—B,C,D,E,H,I,J,K,L,M,N,O,P,Q,R,S,T  
Corning Glass Works, P. O. Box 544, Corning, N.Y.—G  
Corson Electric Mfg., Corp., 540 39 St., Union City, N.J.—K,L,M,O  
Cosmic Radio Corp., 853 Whittier St., Bronx 59, N.Y.—C,L  
Delco Remy Div., General Motors Corp., P. O. Box 640, Anderson, Ind.—A,E  
Deutschmann Corp., Tope, Providence Highway, Norwood, Mass.—C,E,G,I,K,L,M,N,O,T  
Dolin Metal Products, 319 Lexington Ave., Brooklyn 16, N.Y.—C  
Dolinko & Wilkens, Inc., 1901 Summit Av Union City, N.J.—U  
Du-Co Ceramics Co., Box 587, Butler, Pa.—B  
DUMONT ELECTRIC CORP., 308 Dyckman St., New York 34, N.Y.—C,E,H,K  
EITEL-McCULLOUGH INC., 798 San Mateo Ave., San Bruno, Calif.—U  
Electro-Motive Mfg. Co., Willimantic, Conn.—B,E,J,L,P  
Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Texas—C,U  
Erie Resistor Corp., 644 W. 12 St., Erie, Pa. B,E,P  
Fansteel Metallurgical Corp., 2200 Sheridan Rd., No. Chicago, Ill.—R  
Fast & Co., John E., 3143 N. Crawford Ave., Chicago 41, Ill.—H,K,L,M,O,T  
GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—C,D,E,L,M,R  
GENERAL ELECTRIC CO., Tube Dept., 1 River Rd., Schenectady 5, N.Y.—C,L,M,R,U  
GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,J,Q

Geotronic Labs. Inc., 1314 Cedar Hill Ave., Dallas 11, Tex.—M  
Girard-Hopkins, 1000 40 Ave., Oakland 1, Calif.—L  
Good-All Electric Mfg. Co., Ogallala, Nebr.—K,L,N,Q  
Gudeman Co., 340 W. Huron St., Chicago 10, Ill.—C,E,G,H,I,K,L,M,N,O,T  
GULTON MFG. Co., 212 Durham Ave., Metuchen, N.J.—B,S  
Herlec Corp., 6th & Beach Sts., Grafton, Wis.—B  
Hopkins Eng'g. Co., Altadena, Calif.—I  
Illinois Condenser Co., 1616 N. Throop St., Chicago 22, Ill.—M  
Industrial Condenser Corp., 3244 N. Calif. Ave., Chicago 18, Ill.—C,H,K,L,M,N  
Jeffers Electronics Div., Speer Carbon Co., DuBois, Pa.—B,E,M  
Jennings Radio Mfg. Co., P. O. Box 1278, San Jose 8, Calif.—E,T,U  
Johanson Mfg. Co., Boonton, N.J.—A,G  
JOHNSON CO., E. F., Waseca, Minn.—A,F,T  
KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—L  
La Pointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—T  
Lapp Insulator Co., 27 Gilbert St., LeRoy, N.Y.—F  
LEGRI S. CO., 158 W. 99 St., New York 25, N.Y.—B,E,J,P,U  
Lenkurt Electric Co., 1105 County Rd., Sau Carlos, Calif.—L,M  
MacLeon & Hanopol, 10 Roland St., Charlestown, Mass.—Q  
MAGNAVOX CO., Fort Wayne 4, Ind.—C  
Maida Devel. Co., 12 E. Howard St., Phoebus, Va.—B,E,S  
MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—B,C,E,I,J,K,L,M,N,P,R,T  
MEASUREMENTS CORP., Boonton, N.J.—A,E,J  
Micamold Radio Corp., 1087 Flushing Ave., Brookly 37, N.Y.—C,E,H,J,K,L,M,N,P,T  
Monson Corp., 919 N. Michigan Ave., Chicago 11, Ill.—L  
Mucon Corp., 9 St. Francis St., Newark 5, N.J.—B,S  
Muter Co., 1255 S. Michigan Ave., Chicago 5, Ill.—B  
National Capacitor Co., 585 Washington St., Quincy 69, Mass.—E,H,I,K,L,M,N,O,Q,S,T  
Neptune Electronic Co., 433 Broadway, New York 13, N.Y.—H,I,J,K,L,M  
Parts Producing Corp. Manhattan Div., 1861 Second Ave., New York 28, N.Y.—A,H,T  
PCA Electronics Inc., 2180 Colo. Ave., Santa Monica, Calif.—L,M,O  
PLANET MFG. CORP., 225 Belleville Ave., Bloomfield, N.J.—C  
Plastic Capacitors, Inc., 2511 W. Moffat S Chicago 47, Ill.—H,M,O,T  
Potter Co., 1950 Sheridan Rd., North Chicago, Ill.—H,L,M,T,Q  
PREMIER METAL PRODUCTS CO., 3160 Webster Ave., Bronx 67, N.Y.—C,G,N,O  
Pyramid Electric, 1445 Hudson Blvd., N. Bergen, N.J.—C,D,G,H,I,L,M,S  
Radio Ceramics Corp., 109 S. Superior St., Angola, Ind.—B  
Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill.—P  
RADIO MATERIALS CORP., 3325 N. Calif. Ave., Chicago 18, Ill.—B  
Research Instrument Co., 233 Broadway, New York 7, N.Y.—A,B,S,T,U  
Remler Co., 2101 Bryant St., San Francisco 10, Calif.—M  
San Fernando Electric Mfg. Co., 12900 Foot-hill Blvd., San Fernando, Calif.—I,L  
SANGAMO ELECTRIC CO., Capacitor Division, Marion, Ill.—C,H,J,K,L,M,N,P,S,T  
Solar Mfg. Corp., 2660 E. 46 St., Los Angeles 58, Calif.—B,E,P,S  
SPRAGUE ELECTRIC CO., 233 Marshall St., North Adams, Mass.—B,C,E,H,I,J,K,L,M,N,O,P,R,S,T  
STACKPOLE CARBON CO., Tannery St., St. Marys, Pa.—B,Q  
Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.  
Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.—B  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—C,D,J,K,L  
Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—A,H,Q  
Telex Inc., 1633 Eustis St., St. Paul 1, Minn.—B  
Thompson Clock Co., H. C.—38 Federal St., Bristol, Conn.—C,D,E,I,J,N,T  
Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—S  
United Condenser Corp., 337 E. 139 St., New York 54, N.Y.—L,M,O,Q  
U. S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—E,M  
Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—U  
Vitramon, Inc., Stepney, Conn.—G  
Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—A,B,L,M,O  
Walter Co., S., 1400 Atlantic Ave., Brooklyn 16, N.Y.—J,C,F,N,G  
Western Gold & Platinum Works, 589 Bryant St., San Francisco, Calif.—B  
Western Int'l. Co., 45 Vesey St., New York 7, N.Y.—H,J,K,N

Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—B,C,D,E,G,I,K,L,M,O

## 14—CAPACITORS, VARIABLE

Capacitors, air trimmer .....A  
Capacitors, ceramic trimmer .....B  
Capacitors, gas-filled .....C  
Capacitors, mica trimmer .....D  
Capacitors, modulated .....E  
Capacitors, neutralizing .....F  
Capacitors, precision .....G  
Capacitors, receiving tuning .....H  
Capacitors, transmitter tuning .....I  
Capacitors, vacuum .....J

Acrolite Electronics Corp., 507 26 St., Union City, N.J.—I  
AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—B  
All Star Products, Defiance, Ohio—A,H  
Arco Electronics, 103 Lafayette St., New York 13, N.Y.—B,D  
Arnhold Ceramics, Inc., 1 E. 57 St., New York 22, N.Y.—B  
Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—F,I  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—B  
Cambridge Thermionic Corp., 445 Concord Ave., Cambridge 38, Mass.—B  
CENTRALAB, DIV. OF GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wisc.—B  
Communication Device Co., 2331 12 Ave., New York City 27, N.Y.—H,I  
Corning Glass Works, Corning, N.Y.—B  
Du-Co Ceramics Co., Box 587, Butler, Pa.—B  
EITEL-McCULLOUGH INC., 198 San Mateo Ave., San Bruno, Calif.  
Electro-Motive Mfg. Co., Willimantic, Conn.—A,B,D  
Electronic Heating Corp., 66 Needham St., Newton Highlands 61, Mass.—I  
Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Texas—J  
Erie Resistor Corp., 644 W. 12 St., Erie, Pa.—A,B  
General Instrument Corp., 829 Newark Ave., Elizabeth 2, N.J.—A,B,D,G,H,I,J  
GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—G  
GERTSCH PRODUCTS, Inc., 11846 Miss. Ave., Los Angeles 25, Calif.—G  
HAMMARLUND MFG. CO., 460 W. 34th St., New York 1, N.Y.—A,B,F,G,H,I  
Herlec Corp., 6th & Beach St., Grafton, Wisc.—B  
Hi Q Div. Aerovox Corp., Olean, N.Y.—B  
INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—B,D,G  
JENNINGS RADIO MFG. CO., P. O. Box 1278, San Jose 8, Calif.—B,F,G,I,J  
Johanson Mfg. Co., Boonton, N.J.—A,G,H  
JOHNSON CO., E. F., Waseca, Minn.—A,F,H,I  
Lapp Insulator Co., 27 Gilbert St., LeRoy, N.Y.—C  
LEGRI S CO., 158 W. 99 St., New York 25, N.Y.—B  
Maida Devel. Co., 12 E. Howard St., Phoebus, Va.—B  
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—A,F,I  
Muter Co., 1255 S. Michigan Ave., Chicago 5, Ill.—B,G  
National Capacitor Co., 585 Washington St., Quincy 69, Mass.—G  
NATIONAL CO., INC.—61 Sherman St., Malden 48, Mass.—A,D,F,G,H,I  
Parts Producing Corp., Manhattan Div., 1861 2nd Ave., New York 28, N.Y.—G,I  
Plastics & Electronics Co., Inc., 272 Northland Ave., Buffalo 8, N.Y.—H,I  
Radio Condenser Co., Davis & Copewood Sts., Camden, N.J.—G,H  
Research Instrument Co., 233 Broadway, New York 7, N.Y.—F,G,I,J  
Sickles Div., F. W., General Instrument Corp., P.O. Box 330, Chicopee, Mass.—A  
Solar Mfg. Corp., 2660 E. 46 St., Los Angeles 58, Calif.—A,B  
stupakoff Ceramic & Mfg. Co., Latrobe, Pa.—A,B  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—H,I,J  
TARZIAN INC.. SARKES, 539 S. Walnut St., Bloomington, Ind.—A  
Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—G  
Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—E  
Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—H,I  
Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—A,G  
United Electronics Co., 42 Spring St., Newark 4, N.J.—J  
U.S. Gasket Co., 602 N. 10 St., Camden, N.J.—A  
Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—J  
Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—A,B,D  
White Industries Inc., 421 W. 54 St., New York 19, N.Y.—A,H

## 15—CHASSIS ACCESSORIES

### CONNECTING DEVICES

Binding posts	A
Coaxial cable fittings	B
Harnesses	C
Jacks	D
Jumpers	E
Lugs	F
Safety terminals	G
Slip rings	H
Soldering lugs	I
Solderless lugs	J
Terminals & terminal strips	K

### FUSES & FUSE HOLDERS

Fuse clips	L
Fuses	N
Fuse holders	N

### SHIELDING

Coil shielding	O
Electrostatic shielding	P
Heat shielding	Q
Ignition shielding	R
Lead shielding	S
Magnetic shielding	T
Rubber shielding	U
Screen shielding	V
Tube shielding	W

### TUBE ACCESSORIES

Grid clips	X
Ion traps	Y
Shockproof mounts	Z
Tube clamps	AA
Tube sockets	AB



Brelco Electronics Corp., 55 Vandam St., New York 13, N.Y.—D  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—F,I,K,L,Y,AB  
 Buchanan Electrical Products, 236 Route 22, Hillside, N.J.—F,J,K  
 BUD RADIO INC., 2118 E. 55 St., Cleveland 3, Ohio—D  
 Burnay Eng'g. Co., Norwalk, Conn.—J  
 BUSSMANN MFG CO., DIV. OF MCGRAW ELECTRIC CO., University at Jefferson, St. Louis 7, Mo.—L,M,N  
 Cambridge Thermionic Corp., 445 Concord Ave., Cambridge 38, Mass.—I,K  
 Carter Parts Co., 213 Institute Pl., Chicago 10, Ill.—D  
 CENTRALAB, DIV. OF GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wisc.—AB  
 Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—M  
 Cherry-Channer Corp., 1488 Skokie Blvd., Highland Park, Ill.—C  
 Chester Morton Electronics Corp., 10 St. & Morton Ave., Chester, Pa.—C  
 CINCH MFG. CORP., 1026 S. Homon Ave., Chicago 24, Ill.—A,D,F,I,K,L,N,P,V,X,AA,AB  
 Citation Products Co., 233 E. 146 St., New York 51, N.Y.—A,D,E,F,K,AA,AB  
 Coaxial Connector Co., 35 N. 2 Ave., Mount Vernon, N.Y.—B,C,D  
 Collectron Corp., 216 E. 45 St., New York 17, N.Y.—H  
 Conn. Hard Rubber Co., 407 East St., New Haven 9, Conn.—Z  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—C,K  
 Connector Corp., 6025 N. Keystone, Chicago, Ill.—K,AB  
 Consolidated Productions, Inc., Building 9, Broward International Airport, Ft. Lauderdale, Fla.—C  
 CONSTANTIN & CO., L. L., Rt. 6 & Franklin Ave., Lodi, N.J.—K,AB  
 Continental-Diamond Fibre Co., Newark, Del.—K  
 Co-operative Industries, 100 Oakdale Rd., Chester, N.J.—C,R  
 CORNISH WIRE CO., 50 Church St., New York, N.Y.—C  
 Dante Electric Mfg. Co., P.O. Box 6, Bantam, Conn.—F,I,J,K,L  
 Decatur Electronic Industries, 1620 Decatur St., Brooklyn 27, N.Y.—C  
 Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—B  
 Dietz Design & Mfg. Co., Grandview, Mo.—P  
 Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio—K  
 Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.—I,S  
 Dorn Equipment Corp., 88 Broad St., Boston 10, Mass.—A,D  
 DUMONT LABS., INC., Allen B., Instrument Div., 760 Bloomfield Ave., Clifton, N.J.—T  
 DX RADIO PRODUCTS CO., 2300 W. Armitage Ave., Chicago 47, Ill.—Y  
 Eagle Electric Mfg. Co., 23-10 Bridge Plaza, Long Island City, N.Y.—K,L,M,N  
 EBY INC., HUGH H., 4700 Stenton Ave., Philadelphia 44, Pa.—A,B,K,N,W,AB  
 EITEL-McCULLOUGH, INC., San Bruno, Calif.—AB  
 Elco Corp., 190 W. Glenwood Ave., Philadelphia 40, Pa.—A,B,C,K,W,AB  
 Electro Devel. Co., 6006 W. Washington Blvd., Culver City, Calif.—H  
 Electronic Mechanics, Inc., 101 Clifton Blvd., Clifton, N.J.—K,AB  
 Electronic Products Co., Box 450, Red Bank, N.J.—A,C  
 Electro Tec Corp., 4 Romanelli Ave., S. Hackensack, N.J.—H  
 Electro-Tech Equip., 308 Canal St., New York, N.Y.—A,K  
 Eldi Electronic Devices, 204 W. Houston St., New York 14, N.Y.—C  
 Erca Tool Die & Stamping Co., 19 Ash St., Brooklyn 22, N.Y.—K,AA,AB  
 Federal Screw Products Inc., 224 W. Huron St., Chicago 10, Ill.—A,D,F,I,J,K,L,N,X  
 Felts Corp., Microdot Div., 1826 Fremont Ave., S. Pasadena, Calif.—B,C,D  
 FINN & CO., T. R., 333 Jackson Ave., New York 54, N.Y.—Z  
 Gale Dorothea Mechanisms, Inc., 81-01 Broadway, Elmhurst, Long Island, N.Y.—C  
 Garde Mfg. Co., 588 Eddy St., Providence 3, R.I.—A,K  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—AB  
 Gavitt Mfg. Co., Brookfield, Mass.—C  
 Gee-Lar Mfg. Co., 1330 10 Ave., Rockford, Ill.—B,D,N  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—A,D,F,I,J,K,L,N,X,Y,AB  
 General Ceramics & Steatite Corp., Keasbey, N.J.—K  
 GENERAL ELECTRIC CO., MONOWATT DEPARTMENT, 95 Hathaway St., Providence 7, R.I.—C

GENERAL ELECTRIC CO., TUBE DEPARTMENT, 1 River Rd., Schenectady 5, N.Y.—AB  
 General Laminated Products, 2857 S. Halsted St., Chicago 8, Ill.—AB  
 General Products Corp., Union Springs, N.Y.—K  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge, Mass.—A,B,D,K  
 GENERAL R-F FITTINGS CO., 702 Beacon St., Boston 15, Mass.—B  
 Goat Co., Fred, 308 Dean St., Brooklyn 17, N.Y.—W  
 Graphite Metallizing Corp., 1015 Nepperhan Ave., Yonkers, N.Y.—H  
 GUDEBROD BROS., 12 S. 12 St., Philadelphia 7, Pa.—C  
 Hallett Mfg. Co., 1601 W. Florence Ave., Inglewood, Calif.—B,C,E,O,P,R,W  
 Harwood Mfg. Co., 466 W. Superior St., Chicago 10, Ill.—A  
 Helder Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J.—A,F,I,K,O,W  
 HEMINGWAY & BARTLETT, 500 Fifth Ave., New York 36, N.Y.—C  
 HEPPNER MFG. CO., Round Lake, Ill.—Y  
 HERMETIC SEAL PRODUCTS CO., 33 S. 6 St., Newark 7, N.J.—K,M  
 Hobbs Mfg. Co., 26 Salisbury St., Worcester 5, Mass.—C  
 Hobson Bros., 4049 W. Fullerton Ave., Chicago 39, Ill.—F,I,K,X  
 Hubbell, Inc., Harvey, State St. & Bostwick Ave., Bridgeport, Conn.—D  
 HUDSON TOOL & DIE CO., 412 S. 14 St., Newark 7, N.J.—P,W  
 Ideal Industries, 3316 Park Ave., Sycamore, Ill.—L  
 Independent Mfg. Co., 5 Belleview Ave., E. Riverton, N.J.—F  
 Industrial Devices, Edgewater, N.J.—A  
 Industrial Hardware Mfg. Co., 109 Prince St., New York 12, N.Y.—AB  
 Instrument Corp. of America, Blacksburg, Va.—H  
 Instrument Specialties Co., 244 Bergen Blvd., Little Falls, N.J.—P  
 INSULINE CORP. OF AMERICA, 36-02 35th Ave., L.I.C. 1, N.Y.—A,D,F,J,K,L,N,W  
 International Resistance Co., 401 N. Broad St., Philadelphia 8, Pa.—K  
 Ippolito & Co., James, 401 Concord Ave., Bronx 54, N.Y.—AA  
 Janco Corp., 3111 Winona Ave., Burbank, Calif.—Z  
 Javex, Box 646, Redlands, Calif.—D,K  
 Jerrold Electronics Corp., 26 & Dickinson Sts., Philadelphia 46, Pa.—B  
 JFD Mfg. Co., 6101 16 Ave., Brooklyn 4, N.Y.—A,C,F,J,K,L,N,AA  
 JOHNSON CO., E. F., Waseca, Minn.—D,K,W,AB  
 Johnson & Hoffman Mfg. Co., 31 E. 2 St., Mineola, L.I., N.Y.—F,K  
 JONES DIV., HOWARD B., CINCH MFG CORP., Chicago 24, Ill.—K  
 KELLOGG SWITCHBOARD & SUPPLY, 79 W. Monroe St., Chicago 3, Ill.—A,K  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—A,B,D,F,I,J,K,L,N  
 Keystone Watch Case Div., Riverside Metal Co., 1 Pavilion Ave., Riverside, N.J.—O,P  
 Kleigl Bros., 321 W. 50 St., New York 19, N.Y.—E,J  
 Koltan Electric Mfg. Co., 123 N.J. Railroad Ave., Newark 5, N.J.—F,I,J,K,L,N,AA  
 Kulka Electric Mfg. Co., 633 S. Fulton Ave., Mount Vernon, N.Y.—C,F,I  
 Kupfrian Mfg. Co., 367 State St., Binghamton, N.Y.—C,P  
 LaPointe Electronics, 155 W. Main St., Rockville, Conn.—C  
 Lapp Insulator Co., 27 Gilbert St., LeRoy, N.Y.—AB  
 Lee Electronic Labs., 233 Dudley St., Boston 19, Mass.—D  
 LEGRI CO., S., 158 W. 99 St., New York 25, N.Y.—D,F,G,I,J,K,AB  
 Lingren & Assoc., Erik A., 4515 N. Ravenswood Ave., Chicago 40, Ill.—V  
 Littlefuse, Inc., 1865 Miner St., Des Plaines, Ill.—L,M,N  
 Lord Mfg. Co., 1635 13 St., Erie, Pa.—Z  
 Lundy Associates, 694 Main St., Waltham 54, Mass.—K  
 Lynn Electronic Research Co., 9 W. Magnolia, Burbank, Calif.—F,I,K  
 Lysco Mfg. Co., 1401 Clinton St., Hoboken, N.J.—K  
 MacLeon & Hanopol, 10 Roland St., Charlestown 9, Mass.—C  
 Malco Tool & Mfg. Co., 4025 W. Lake St., Chicago 24, Ill.—A,F,I,J,K  
 Mandex Mfg. Co., 2608 W. 16 St., Chicago 8, Ill.—A,D,F,I,K,AB  
 Marlin Electric Co., 1750 N. Campbell Ave., Chicago 47, Ill.—K,L,N  
 MB Mfg. Co., 1060 State St., New Haven 11, Conn.—Z  
 Mercury Eng'g. Corp., 399 E. Cottage Pl., York, Pa.—C  
 Metal Textile Corp., Roselle, N.J.—O,P,W,Z  
 Methode Mfg. Corp., 2021 W. Churchill St., Chicago 47, Ill.—F,K,W,AA,AB  
 Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—K,P  
 Micro-Circuits Co., New Buffalo, Mich.—W  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—A,D,K,O,T,W,X  
 Miller Co., J.W., 5917 S. Main St., Los Angeles 3, Calif.—K  
 Minn. Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis 16, Minn.—U

Modelectric Prod. Corp., Asbury Park, N.J.—C  
Molding Corp. of America, 40 Church St., Pawtucket, R.I.—H,K  
Morse Co., Frank W., 1300 Soldiers Field Rd., Boston 35, Mass.—K,AB  
Multi-Metal Co., 1350 Garrison Ave., New York 59, N.Y.—P  
MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—AB  
NATIONAL CO., 61 Sherman St., Malden 48, Mass.—A,K,X,AA,AB  
National Electronic Mfg. Corp., 42-08 Vernon Blvd., Long Island City 1, N.Y.—J  
National Fabricated Products, 2650 W. Belden Ave., Chicago 47, Ill.—AB  
National Instrument Corp., 23 E. 26 St., New York 10, N.Y.—B  
National Tel-Tronics Corp., 35 St. Casimir Ave., Yonkers, N.Y.—D,N  
Neo-Sil Corp., 26 Cornelison Ave., Jersey City 4, N.J.—N  
Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N.J.—V  
Ney Co., J. M., 179 Elm St., Hartford 1, Conn.—H  
Pacific Mercury Research Center, 1500 Mission Canyon Rd., Santa Barbara, Calif.—C  
Parts Producing Corp., 1861 2 Ave., New York 28, N.Y.—K  
Penn Fibre & Specialty Co., 2030 E. Westmoreland St., Philadelphia 34, Pa.—N  
Perfection Electric Co., 2635 S. Wabash Ave., Chicago 16, Ill.—Y  
Perma-Power Co., 4727 W. Damen Ave., Chicago 25, Ill.—X  
Peschel Electronics, 13 Garden St., New Rochelle, N.Y.—C  
Petroff, Peter A., 127 Water St., New York 5, N.Y.—B  
Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—A,D,F  
Pix Mfg. Co., 22 Bedford St., Newark 3, N.J.—F,I,K  
Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—A  
PM Industries, 280 Fairfield Ave., Stamford, Conn.—H  
PRODELIN INC., 307 Bergen Ave., Kearny, N.J.—B  
Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—C,F,I  
RADIO RECEPTOR CO., 251 W. 19th St., New York 11, N.Y.—AB  
Rajah Co., 53 Locust Ave., Bloomfield, N.J.—K  
RAYPAR INC., 7800 W. Addison St., Chicago 34, Ill.—AB  
R-C Scientific Instrument Co., 307 Culver Blvd., Plava Del Rev. Calif.—K,S  
Reliable Spring & Wire Forms Co., 3167 Fulton Rd., Cleveland 9, Ohio—F,H  
Remler Co., 2101 Bryant St., San Francisco 10, Calif.—D,AA,AB  
R.F.I. Shielded Enclosures, 3634 N. Lawrence St., Philadelphia 40, Pa.—R  
ROBINSON AVIATION INC., Teterboro Air Terminal, Teterboro, N.J.—Z  
Rodale Mfg. Co., 6 & Minor Sts., Emmaus, Pa.—M  
Roffan Co., Topsfield, Mass.—A,B,C  
Rollon Rubber Products, 1805 Jerome Ave., Bronx 53, N.Y.—U  
Runzel Cord & Wire Co., 4723 Montrose Ave., Chicago 41, Ill.—C,W  
Screw Corp. of America, 103 Park Ave., New York 17, N.Y.—A,D,F,J,K  
Sealectro Corp., 186 Union Ave., New Rochelle, N.Y.—K  
Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—F,G,K  
Sherman Mfg. Co., H.B., 22 Barney St., Battle Creek, Mich.—F,I,J,K,L  
SHIELDING, INC., Riverside Park, N.J.—V  
Sittler Corp., 18 N. Ada, Chicago 7, Ill.—C,E  
Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y.—A,B,C,D,E,F,I,J,K,L,N,W,X,AA,AB  
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—O  
Spaulding Fibre Co., 310 Wheeler St., Tonawanda, N.Y.—K,N  
Special Products Co., 9115 Brookville Rd., Silver Spring, Md.—C  
Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—A,B,C,K,N  
Sperti Faraday, Inc., 1077 Celestial St., Cincinnati 2, Ohio—K  
Star Expansion Products Co., 147 Cedar St., New York 6, N.Y.—AA,AB  
Star Fuse Co., 235 Canal St., New York 13, N.Y.—L,M,N  
States Co., 19 New Park Ave., Hartford, Conn.—A  
Staver Co., 41-51 N. Saxon Ave., Bay Shore, N.Y.—K,P,T,V,AA  
Stone City, P.O. Box 351, Bedford, Inc.—F,I,K,L,N,X,AA  
Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.—K  
Superior Electric Co., 83 Laurel St., Bristol, Conn.—A  
Switchcraft Inc., 1328 N. Halstead St., Chicago, Ill.—D  
SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—K,L,N,AB  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—D,E  
Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—A,C,H  
Tempo T-V Products Co., 2450 Romona Blvd., Los Angeles 33, Calif.—K  
Thompson Bremer & Co., 1640 W. Hubbard St., Chicago 42, Ill.—K

Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,D,E,F,K,L,M,N  
Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—AA  
TINNERMAN PRODUCTS, INC., P.O. Box 6688, Cleveland 1, Ohio—AA  
Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—R  
Tri-Dex Co., P.O. Box 1207, Lindsay, Calif.—K  
Tube Socket Corp., 60 Clifton Blvd., Clifton, N.J.—AB  
T.V. Development Corp., 2024 McDonald Ave., Brooklyn 23, N.Y.—B  
T-V Products Co., 152 Sandford St., Brooklyn 5, N.Y.—A,C,L,N,AA  
Ucinite Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.—B,D,F,K,P,Z,AB  
United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.—F,K,AB  
United Mfg. & Service Co., 409 S. 6 St., Milwaukee 4, Wisc.—C  
U.S. Engineering Co., 521 Commercial St., Glendale 3, Calif.—F,I,K  
U. S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—K,AB  
Vaco Products Co., 317 E. Ontario St., Chicago 11, Ill.—F,J,K  
Vector Electronic Co., 3352 San Fernando Rd., Los Angeles 65, Calif.—K,AB  
Vitroscop Corp., 6325 Guilford Ave., Indianapolis 20, Ind.—K  
Vokar Corp., Dexter, Mich.—C  
Volkert Metal Stampings, John, 222-34 96 Ave., Queens Village 8, L.I., N.Y.—W  
Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—K,L,N,X  
Waldom Electronics, 911 N. Larrabee St., Chicago 10, Ill.—A,F,I,J,K,AB  
Western Electronic Enterprises, 3348 W. Compton Blvd., Gardena, Calif.—B  
Western Int'l. Co., 48 Vesey St., New York 7, N.Y.—D,K,L,M,N,X  
Whittaker Cable Corp., 1301 Burlington Ave. N., Kansas City, Mo.—C,E  
Willard Storage Battery Co., 1200 Huron Rd., Cleveland, Ohio—E,K  
Winchester Electronics Inc., 15 Crescent St., Glenbrook, Conn.—AB  
W.M.C. Inc., 1753 N. Damen Ave., Chicago 47, Ill.—AB  
Wood Co., Ash M., 11928 E. Garvey Blvd., El Monte, Calif.—B,L,M,N  
Wright-Hepp Assoc., 138 West St., S. Hackensack, N.J.—K  
Zierick Mfg. Corp., Beechwood & Rockdale Aves., New Rochelle, N.Y.—F,L,X

## 16—CIRCUITS

Circuits, etched ..... A  
Circuits, potted ..... B  
Circuits, printed ..... C  
Circuits, stamped ..... D  
Delay lines ..... E  
Terminal boards ..... F  
Terminal strips ..... G

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—E  
AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—C,E  
Advance Electronics Co., P. O. Box 394 Pas-saic, N.J.—E  
Aerolite Electronics Corp., 507 26 St., Union City, N.J.—F,G  
Ahrendt Instrument Co., 4910 Calvert Rd., College Park, Md.—B  
Aircraft Marine Products, 2100 Paxton St., Harrisburg, Pa.  
Airflyte Electronics Co., 21 Cottage St., Bay-onne, N.J.—B,C  
ALDEN PRODUCTS CO., 117 N. Main St., Brockton, Mass.—C,D,E,F,G  
Allied Allegri Machine Co., 141 River Rd., Nutley 10, N. J.—F,G  
Allied Engraving and Stamping Co., 161 Elli-cott St., Buffalo 3, N.Y.—C  
Allied Research & Eng'g. Inc., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—A  
American Metaseal Co., 3337 Lincoln Ave., Franklin Park, Ill.—C  
AMERICAN PHENOLIC CORP., 1830 54 Ave., Chicago 50, Ill.—F,G  
Anderson Labs., W. Hartford, Conn.—E  
Applegate & Co., C. J., 1816 Grove St., Boulder, Colo.  
Arenberg Ultrasonic Lab., 94 Green St., Ja-maica Plain 30, Mass.—E  
Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—B  
Automatic Radio Mfg. Co., 122 Brookline Ave., Boston 15, Mass.—A  
Baer Co., N. S., 1 Montgomery St., Hillside 5, N.J.—F,G  
Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—E  
Bell Sound Systems, 555 Marion Rd., Colum-bus 7, Ohio  
Bendix Aviation Corp., 11600 Sherman Way, New Hollywood, Calif.—A,B,C,D  
Bestcraft Products Co., 626 Broadway, New York 12, N.Y.—D  
Bliss Electronic Corp., Box 123, Sussex, N.J.—G  
BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa.—E  
BOGART MFG., 315 Seigel St., B'klyn, N.Y.—C  
BREW & CO., RICHARD D., 106 Concord Ave., Belmont, Mass.—E  
Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,C  
British Electronic Sales Co., 23-03 45 Rd., Long Island City, N.Y.—F,G  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—C  
Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles 34, Calif.—A,B,C,E  
BURROUGHS ADDING MACHINE CO., 511 N. Broad St., Philadelphia 23, Pa.  
Cambridge Thermionic Corp., 437 Concord Ave., Cambridge 38, Mass.—F,G  
CENTRALAB, DIV. GLOBE-UNION Inc., 900 E. Keefe Ave., Milwaukee 1, Wisc.—C  
Centronics Co., 21-04 122 St., College Point 56, N.Y.—A,B,C  
C.G.S. Labs Inc., 391 Ludlow St., Stamford Conn.—E  
Circuitron, Inc., 400 Ninth St., Hoboken, N.J.—B,C,F,G  
Citation Products Co., 233 E. 146 St., New York 51, N.Y.—A,C,F,G  
Colorvision Plastics Inc., 247 Atlantic Ave., Boston 10, Mass.—C,F,G  
Columbia Technical Corp., 5 E. 57 St., New York 22, N.Y.—E  
Communication Measurements Lab. Inc., 350 Leland Ave., Plainfield, N.J.—A,C,E  
Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—F,G  
Consolidated Productions, Bldg. 9, Broward Int'l. Airport, Ft. Lauderdale, Fla.—F  
Continental Connector Corp., 30-30 Northern Blvd., Long Island City 1, N.Y.—F  
Continental Diamond Fibre, Newark, Del.—C  
Corning Glass Works, Corning, N.Y.—A,C,E  
Corona Eng'g. Service, 94-52 Corona Ave., Elmhurst, L.I., N.Y.—E  
Corson Electric Mfg., Corp., 540 39 St., Union City, N.J.  
Croname, Inc., 3701 Ravenswood Ave., Chicago 13, Ill.—A  
Daven Co., 191 Central Ave., Newark 4, N.J.—A,C  
Deutschmann Corp., Tobe, Providence High-way, Norwood, Mass.—E  
Dietz Co., Henry G., 12-16 Astoria Blvd., Long Island City 2, N.Y.—A,C,E  
Dietz Design & Mfg. Co., Grandview, Mo.—E  
Dorn Equip. Corp., 88 Broad St., Boston 10, Mass.—F  
Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—F,G  
DUMONT LABS. INC., Allen B., Instrument Div., 760 Bloomfield Ave., Clifton, N.J.—E

DO YOU  
KNOW THAT . . .

## THE 1953 ELECTRONIC INDUSTRIES DIRECTORY

contains

### THE MOST UP-TO-DATE LIST OF MANUFACTURERS

Lists thousands of manufacturers in the electronic and allied industries—about a thousand more than in the next best directory listing. A great many manufacturers are listed for the first time in any directory—thanks to the tireless field investigations and constant scrutiny of new firms by the editors of TELE-TECH. See page 312.

**TELE-TECH**  
& ELECTRONIC INDUSTRIES

DUMONT LABS INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—A  
 Dynakon Corp., 9623 Clinton, Cleveland, Ohio—C  
 EBY INC., HUGH H., 4700 Stenton Ave., Philadelphia 44, Pa.—A,C,F,G  
 Electralab, Inc., 106 First St., Cambridge, Mass.—A,B  
 Electronic Computer Co., 265 Butler St., Brooklyn 17, N.Y.—E  
 Electronic Mechanics, Inc., 101 Clifton Blvd., Clifton, N.J.—C  
 Electrometric, Inc., Woodstock, Ill.—E  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—C  
 Electro-Tech Equipment Co., 308 Canal St., New York, N.Y.—F,G  
 El-Rad Mfg. Co., 2800 W. Cullom, Chicago 18, Ill.—E  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—C,D,F  
 Emerson & Cuming, 869 Washington St., Canton, Mass.—B  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—B  
 Empire State Labs., 2608 Merrick Rd., Bellmore, Long Island, N.Y.—E  
 Eng'g. Research Associates, Inc., Div., Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—B,E  
 Eng'g. Research & Development Co., Addison, Ill.—C,D  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—F,G  
 Erie Resistor Corp., 644 W. 12th St., Erie, Pa.—C,E  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—E,F,G  
 Etched Products Corp., 3901 Queens Blvd., Long Island City 1, N.Y.—A  
 Fidelity Amplifier Co., 703 W. Willow St., Chicago 14, Ill.—F  
 Gables Eng'g. Inc., 247 Greco Ave., Coral Gables, Fla.—F  
 Gamewell Co., Newton Upper Falls 64, Mass.—F  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—B,G  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—E,F  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—F  
 General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y.—E  
 General Products Corp., Union Springs, N.Y.—F,G  
 Goldsmith Bros. Smelting & Refining Co., 111 N. Wabash Ave., Chicago 2, Ill.—A  
 GULTON MFG. CO., 212 Durham Ave., Metuchen, N.J.—C,E  
 Gurley, W. & L. E., 514 Fulton St., Troy, N.Y.—A,C  
 GUTHMAN & CO., EDWIN I., 15 S. Throop St., Chicago 7, Ill.—E  
 Herlec Corp., 6th & Beach Sts., Grafton, Wis.—C  
 Hi-Q, Div. Aerovox Corp., Olean, N.Y.—C  
 Houghton Labs., Inc., 322 Bush St., Olean, N.Y.—B  
 Hycon Mfg. Co., 2961 E. Colorado Blvd., Pasadena 8, Calif.—E  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—F,G



Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—A,B,C  
 Int'l. Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—E  
 Int'l. Resistance Co., 401 N. Broad St., Philadelphia 8, Pa.—C  
 Jacobs Instrument Co., 4718 Bethesda Ave., Bethesda 14, Md.—B  
 Javex, Box 646, Redlands, Calif.—C  
 Johnson Labs., Willard Rd., Norwalk, Conn.—C  
 Kalbfell Labs., Inc., 1090 Morena Blvd., San Diego 10, Calif.—A,B,C,E  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—F,G  
 Kulka Electric Mfg. Co., Mt. Vernon, N.Y.—F  
 Lab for Electronics, 75 Pitts St., Boston, Mass.—E  
 LaPointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—C  
 Lyman Electronic Corp., 12 Cass St., Springfield, Mass.—F,G  
 Lynmar Engineers, 1432 N. Carlisle St., Philadelphia 21, Pa.—E  
 Lynn Electronic Research Co., 9 W. Magnolia, Burbank, Calif.—F,G  
 Lysco Mfg. Co., 1401 Clinton St., Hoboken, N.J.—D  
 Magne-Pulse Corp., 140 Nassau St., New York 38, N.Y.—E  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,B,C,F,G  
 Maida Devel. Co., Phoebus, Va.—A  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—F  
 May Eng'g. Co., 6055 Lankershim Blvd., North Hollywood, Calif.—E  
 McIntosh Lab., Inc., 329 Water St., Binghamton, N.Y.—F  
 MELPAR, INC., 452 Swann Ave., Alexandria, Va.—B  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—F  
 Methode Mfg. Corp., 2021 W. Churchill St., Chicago 47, Ill.—A,C,F  
 Micro-Circuits Co., New Buffalo, Mich.—C  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—E,F,G  
 Miller Co., J. W., 5917 S. Main St., Los Angeles 3, Calif.—F,G  
 Modelectric Prod. Corp., Asbury Park, N.J.  
 Molding Specs., Inc., 52 Islin St., Yonkers 2, N.Y.—B  
 MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—C,F,G  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—B  
 North Electric Mfg. Co., South Market St., Galion, Ohio—G

North American Model Products, 9802 Warwick Rd., Warwick, Va.—A,C  
 Northern Industrial Chemical Co., 7 Elkins St., South Boston 27, Mass.—F,G  
 Nutone, Inc., Madison & Redbank Rd., Cincinnati 27, Ohio—F,G  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—B,F  
 Pacific Mercury Research Center, 1500 Mission Canyon Rd., Santa Barbara, Calif.  
 PCA Electronics Inc., 2180 Colorado Ave., Santa Monica, Calif.—A,B,C,D,E  
 Philbrick Researches, Inc., Geo. A., 230 Congress St., Boston 10, Mass.—F  
 PHOTOCIRCUITS CORP., Glen Cove, N.Y.—A,B,C,E,F,G  
 Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N.Y.—A,C  
 Precision Hearing Aids, 5157 W. Grand Ave., Chicago 39, Ill.—F  
 RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S 5 St., Harrison, N.J.—C  
 RAYTHEON MFG. CO., Newton, Mass.—C  
 RAYTHEON MFG. CO., Waltham 54, Mass.—E  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—F  
 Richardson Co., Lockland, Cincinnati 15, Ohio—A,C,F,G  
 Rich-Roth Labs., 1240 Main St., Hartford 3, Conn.  
 Rogers Corp., Goodyear, Conn.—F  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—B  
 Sanders Associates, 137 Canal St., Nashua, N.H.—C  
 Sargent-Rayment Co., 212 9 St., Oakland 7, Calif.—F  
 Scott Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—F  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—F,G  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—E  
 Sickles, F. W., Div., General Instrument Corp., P.O. Box 330, Chicopee, Mass.—E  
 Sittler Corp., 18 N. Ada St., Chicago 7, Ill.—F  
 Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y.—F,G  
 Solar Mfg. Corp., 2660 E. 46 St., Los Angeles 58, Calif.—A,C  
 Specialty Assembling, 79 Clifton Pl., Brooklyn 38, N.Y.—F,G  
 SPRAGUE ELECTRIC CO., 233 Marshall St., North Adams, Mass.—C,E  
 St. Regis Paper Co., Panelyte Div., 230 Park Ave., New York, N.Y.—A  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—A,B,C,E  
 Star Fuse Co., 235 Canal St., New York 13, N.Y.—A,C  
 Stone City, P.O. Box 351, Bedford, Ind.—G  
 Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.—F  
 STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa.—C  
 Stromberg-Carlson Co., Rochester 3, N. Y.—F,G  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—D  
 Technitrol Eng'g. Co., 2751 N. Fourth St., Philadelphia 33, Pa.—E  
 Technograph Printed Electronics, 191 Main St., Tarrytown, N.Y.—A,B,C  
 TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—E  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—C  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—A,B,C,F,G  
 TV Labs, Inc., 5045 W. Lake St., Chicago 44, Ill.—A,C,D  
 Thermo Instrument Co., P. O. Box 336, Belmont, Calif.  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—C,D,F,G  
 Torwico Electronics, 967 Frelinghuysen Ave., Newark 5, N.J.—E,F,G  
 Tri-Dex Co., P. O. Box 1207, Lindsay, Calif.—A,B,C,E,F,G  
 United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.—G  
 U. S. Electronics Corp., 275 Warren St., Lyndhurst, N.J.—E  
 U. S. Eng'g. Co., 521 Commercial St., Glendale 3, Calif.—F,G  
 U. S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—A,C,D,E,F,G  
 Univex Corp., 102 Warren St., New York 7, N.Y.—F  
 Vanguard Electronics Co., 3384 Motor Ave., Los Angeles 34, Calif.—B,E  
 Visart Inc., 2634 Park Ave., New York 51, N.Y.—C  
 Vokar Corp., Dexter, Mich.—C  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—C,F,G  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—A,B,E  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—B,E,F,G  
 White Industries, 421 W. 54 St., New York 19, N.Y.—F,G  
 Willson Camera Co., 1401 Lawrence Rd., Havertown, Pa.  
 Winchester Electronics, Glenbrook, Conn.—C  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—A,E

### DC CHARACTERISTICS of SATURABLE REACTOR CORE MATERIALS

COMP (REST IRON)	TRADE NAME	SPECIAL TREATMENT	MAXIMUM PERMEABILITY	SATUR. B-H (KAUSS)	RESIDUAL FLUX D. (K GAUSS)	B RES. B SAT APPR	COERCIVE FORCE (OERSTEDT)	RESIST S MCR. CM
3-4% Si	TRANSFORMER STEEL	NONE	5,000 - 10,000	20	12	0.6	APPR. 0.5	60
	HYPERSIL TRANCOR 3X SILELECTRON	GRAIN ORIENTED	20,000 - 40,000	20	14	0.7	0.1 - 0.3	
45-50% Ni	VARIOUS DESIGNATIONS	NONE	20,000 - 50,000	16	6-8	0.45	0.2 - 0.3	40 - 50
	DELTAMAX PERMENORM 5000Z	GRAIN	20,000 - 200,000	16	13-15	0.9	0.1-0.4	50
	HYPERNIK X ORTHONIK ORTHONOL	ORIENTED						
65% Ni	65 PERMALLOY	MAGN. ANNEAL	300,000 - 600,000	14	14	1	0.01 - 0.2	
77 Ni	MU METAL	NONE						
80% Ni	HYMU 80	NONE	40,000 - 100,000	8	4-5	0.5	0.05-0.15	55
79Ni4Mo	4-79 Mo - PERMALLOY	NONE						
79Ni5Mo	SUPERMALLOY	NONE	100,000 - 500,000	7.8	4-5.5	0.6	0.002-0.06	65
50% Co	NONE	MAGN. ANNEAL	10,000 - 30,000	22.4	19	0.85	0.7	
FERRITES (GRAIN METAL OXIDES)	FERRAMIC MF1118		700	2.35	2.13	0.91	1.6	
	FERRAMIC MF666		250	1.66	1.37	0.83	2.6	
	CERAMAG 7 (AT 80 CPS)		4600	2.46	1.74	0.71	0.2	18 x 10 <sup>10</sup>

## 17—CHOKES

**Chokes, audio** . . . . . A  
**Chokes, R-F receiving** . . . . . B  
**Chokes, R-F transmitting** . . . . . C

ACE COIL & ELECTRONICS CO., 914 Middlesex Ave., Metuchen, N.J.—B,C  
Acme Electronics, 300 N. Lake Ave., Pasadena 4, Calif.—A  
Acorn Electronics Corp., Box 348, Gibson City, Ill.—A  
Acro Transformer & Mfg. Corp., 26-02 4 St., Long Island City 2, N.Y.—A  
Aerocoil Inc., 24 Cliff St., Jersey City, N.J.—B,C  
Aerolite Electronics Corp., 507 26 St., Union City, N.J.—A,B,C  
AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—A,B,C  
AIRCRAFT TRANSFORMER CORP., West & Willow Aves., Long Branch, N.J.—B,C  
AIRDESIGN, INC., 241 Fairfield Ave., Upper Darby, Pa.—A  
Airpax Products Co., P. O. Box 137, Middle River—Baltimore 2, Md.—A  
A.J.F. Industries, 852 Monroe St., Brooklyn 21, N.Y.—A  
Artled, Inc., 367 Worthington St., Springfield, Mass.—A,M  
Atlas Coil Winders, Inc., 39 Manhattan St., Stamford Conn.—B,C  
Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—B,C  
Best Mfg. Co., 1200 Grove St., Irvington 11, N.J.—A  
Broadway Coil Co., 5638 Broadway, Chicago 40, Ill.—B,C  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A,B  
BUD RADIO INC., 2118 E. 55 St., Cleveland 3, Ohio—A,C  
Burnell & Co., Yonkers 2, N.Y.—A  
Cambridge Thermionic Corp., 445 Concord Ave., Cambridge 38, Mass.—B  
Carad Corp., 93 Leland Ave., San Francisco, 28, Calif.—B,C  
Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—A  
Central Coil Co., 1720 N. Luett St., Indianapolis 22, Ind.—A,B  
C.G.S. Labs. Inc., 391 Ludlow St., Stamford, Conn.—A,B,C  
Chicago Transformer, 3501 Addison St., Chicago 18, Ill.—A  
Clippard Instrument Lab., 7390 Colerain Rd., Cincinnati 24, Ohio—B  
Coast Coil Co., 5352 W. Washington Blvd., Los Angeles 16, Calif.—A  
Codetypers Labs., 550 5 Ave., New York 19, N.Y.—A  
Coil Eng'g. & Mfg. Co., Roanoke, Ind.—A  
Coil Winders, Inc., New York Ave., Westbury, L.I., N.Y.—A,B,C  
Communication Accessories Co., Hickman Mills, Mo.—A  
Communication Parts, 7215 W. Irving Park Rd., Chicago 34, Ill.—B,C  
Component Mfrs. Inc., 11-04 Jackson Ave., Long Island City 1, N.Y.—B  
Condor Radio Mfg. Co., 116 N. Montezuma St., Prescott, Ariz.—B  
Continental Electronics Mfg. Co., 4212 S. Buckner Blvd., Dallas 10, Tex.—C  
Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,B,C  
Crest Transformer Corp., 1834 W. North Ave., Chicago 22, Ill.—A  
Custom Electronics Corp., 738 Speedwell Ave., Morris Plains, N.J.—B,C  
DeCoursey Eng'g. Lab., P. O. Box 235, Los Angeles 25, Calif.—A  
Delta Electronics Inc., Div. of Electronic Indicator Corp., 259 Green St., Brooklyn, N.Y.—A  
Delta Radio Co., 115 Worth St., New York 13, N.Y.—A,B,C  
Diatron Co., 3327 Dixie Dr., Houston 21, Texas—A,B,C  
Dietz Design & Mfg. Co., Grandview, Mo.—A,B  
Dormitzer Electric & Mfg., Co., 5 Hadley St., Cambridge 40, Mass.—A  
D & R Ltd., 402 E. Gutierrez St., Santa Barbara, Calif.—A  
DUMONT LABS. INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—M  
Dunkle Coil Co., 3257 W. 6 St., Los Angeles, Calif.—A,B,C  
DX RADIO PRODUCTS, INC., 2300 W. Armitage Ave., Chicago 47, Ill.—B  
Electrical Windings, Inc., 2051 N. Kolmar Ave., Chicago 39, Ill.—A  
Electro Assemblies, Inc., 2935 W. Belmont Ave., Chicago 18, Ill.—M  
Electronic Coils, Inc., 33 Lyman St., Springfield, Mass.—B,C  
Electronic Research Co., 11550-39 N.E., Seattle 55, Wash.—N  
Electronic Transformer Co., 207 W. 25 St., New York 1, N.Y.—A  
Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—A,B  
El-Rad Mfg. Co., 2800 W. Cullom, Chicago 18, Ill.—B,C  
Empire Coil Co., Beechwood Ave. & 2nd St., New Rochelle, N.Y.—A  
EpcO Products, Inc., 2500 Atlantic Ave., Brooklyn 7, N.Y.—A  
Equin. & Service, Co., 6815 Oriole Dr., Dallas 9, Tex.—A,B,C

Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C  
Essex Electronics, 550 Springfield Ave., Berkeley Heights, N.J.—B  
Ferranti Electric, Inc., 30 Rockefeller Plaza, New York 20, N.Y.—A  
Forbes & Wagner, Inc., 339 Central Ave., Silver Creek, N.Y.—B  
FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—A  
Fugle-Miller Labs., 398 Main St., Metuchen, N.J.—B,C  
Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—B,C  
GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—C  
GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B  
General Transformer Co., 18240 S. Harwood Ave., Homewood, Ill.—A  
Geotronic Laos, Inc., 1314 Cedar Hill Ave., Dallas 11, Texas.—A  
Goslin Electric & Mfg. Co., 2921 W. Olive Ave., Burbank, Calif.—A  
Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill.—A  
Grayburne Corp., 4-6 Radford Pl., Yonkers, N.Y.—B  
Halldorson Transformer Co., 4500 N. Ravenwood Ave., Chicago 40, Ill.—A  
Highland Eng'g. Co., Main & Urban Sts., Westbury, L.I., N.Y.—A  
Hillburn Electronic Products Co., 55 Nassau Ave., Brooklyn 22, N.Y.—M,N  
Hindle Transformer Co., Woods Church Rd., Flemington, N.J.—A  
HiQ Div., Aerovox Corp., Olean, N.Y.—A,B,C  
Houlihan Co., T. J., 2508 W. Lawrence Ave., Chicago 25, Ill.—M,N  
Industrial Transformer, Gouldsboro, Pa.—A  
INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—B,C  
Int'l. Resistance Co., 401 N. Broad St., Philadelphia 3, Pa.—B  
Jeffers Electronics Div., Speer Carbon Co., Du Bois, Pa.—A,B,C  
Johnson Labs., Willard Rd., Norwalk, Conn.—B,C  
KENYON TRANSFORMER CO., 840 Barry St., Bronx 59, N.Y.—A  
K-V Transformer Corp., 20 E. Franklin St., Danbury, Conn.—A  
LANGEVIN MFG. CORP., 37 W. 65 St., New York 23, New York—A  
Lectroh, Inc., 5560 Northwest Highway, Chicago 30, Ill.—C  
Leeds Eng'g. Co., 34-40 79 St., Jackson Heights 72, N.Y.—A  
Lenkart Electric Co. 1105 County Rd., San Carlos, Calif.—A  
Leonard Electric Products Co., Inc., 67 34 St., Brooklyn 32, N.Y.—A,B,C  
LePace Mfg. Co., 75-19 64 St., Glendale 27, N.Y.—A  
Lynmar Engineers, 1432 N. Carlisle St., Phila. 21, Pa.—B  
Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,B,C  
Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—M,N  
Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—A,B,C  
May Eng'g. Co., 6055 Lankershim Blvd., North Hollywood, Calif.—A  
MEASUREMENTS CORP., Boonton, N.J.—A  
Mercury Electro-Products, Inc., 622 W. Kinzie St., Chicago 10, Ill.—A,B,C  
Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.—A,B,M  
Microtran Co., Div. Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach 93, N.Y.—A,B  
Mid-West Coil & Transformer Co., 1642 Halsted St., Chicago 14, Ill.—A  
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—B,C  
Miller Co., J. W. 5917 S. Main St., Los Angeles 3, Calif.—B,C  
Muter Co., 1255 S. Michigan Ave., Chicago 5, Ill.—A  
National Coil Co., P. O. Box 1237, Sheridan, Wyo.—B,C

NATIONAL CO., 61 Sherman St., Malden 48, Mass.—A,B,C  
Ogden Coil & Transformer Co., 2124 W. Carroll Ave., Chicago 12, Ill.—A  
Ohmite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill.—B,C  
Orthon Corp., 196 Albion Ave., Paterson, N.J.—A,B,C  
Otis Radio & Electric Corp., 700 Central Ave., Hawarden, Iowa—A,B  
Oxford Electric Corp., 3911 S. Michigan Ave., Chicago 15, Ill.—A  
P C A Electronics Inc., 2180 Colorado Ave., Santa Monica, Calif.—A,B,C  
Peerless Electrical Products, Div. Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—A  
Permoflux Corp., 49000 W. Grand Ave., Chicago 39, Ill.—A  
Pioneer Electronics Corp., 24 Saunders St., Salem, Mass.—B  
Q.L.C. Corp., 10 Aubrey St., Summit, N.J.—B  
Radio Coils 1519 W. Devon Ave., Chicago 26, Ill.—M  
RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—A,M  
Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill.—B,C  
Radio Music Corp., 84 S. Water St., Port Chester, N.Y.—A  
Radio TV Products, Grass Lake, Mich.—B  
Randall, Inc., Douglas, 102 High St., Westerly, R.I.—A  
RAYPAR INC., 7800 W. Addison St., Chicago 34, Ill.—B  
RAYTHEON MFG CO., Waltham 54, Mass.—A  
Redman Electronics Corp., 92 Prospect St., Thompsonville, Conn.—A,B,C  
Reliable Spring & Wire Forms Co., 3167 Fulton Rd., Cleveland 9, Ohio.—M  
R. K. Mfg. Co., P. O. Box 112, Marion, Ill.—A  
Rola Co., 2530 Superior Ave., Cleveland 14, Ohio—A  
Ross Mfg. Co., 2405 Armitage Ave., Chicago, Ill.—B  
Saratoga Industries, Ballston Ave., Saratoga Springs, N.Y.—A  
SHALLCROSS MFG., CO., 520 Pusey Ave., Collingdale, Pa.—B  
Sickles Div., F. W., General Instrument Corp., P. O. Box 330, Chicopee, Mass.—B,C  
Smith Mfg. Co., Nathan R. 105 Pasadena Ave., S. Pasadena, Calif.—A  
SNC Mfg. Co., P. O. Box 277, Oshkosh, Wis.—A  
Sonotone Corp., Elmsford, N.Y.—A  
Southwestern Industrial Electronics, 2831 Post Oak Rd., Houston, Tex.—A  
Sparton Radio TV, 2400 E. Ganson St., Jackson, Mich.—A,B,C  
Specialties Inc., Skunks Miscery Rd., Syosset, L.I., N.Y.—A  
Square Root Mfg. Corp., 391 Saw Mill River Rd., Yonkers, N.Y.—A,B,C  
Standard Electrical Products Co., 2240 E. 3 St., Dayton 3, Ohio.—A  
Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A  
STANDARD TRANSFORMER CORP., 3580 Elston Ave., Chicago 18, Ill.—A,B  
Standard Winding Co., 44 Johnes St., Newburgh, N.Y.—A,B,C  
Stanwyck Winding Co., P. O. Box 70, Newburgh, N.Y.—A,B,C  
Sterling Transformer Corp., 297 N. 7 St., Brooklyn 11, N.Y.—B  
Summit Coil Co., 67 Union Pl., Summit, N.J.—M,N  
Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—A,B,C  
Todd-Tran Corp., 156 Gramatan Ave., Mount Vernon, N.Y.—A  
Transformer Mfrs. Inc., 850 W. Weed St., Chicago 22, Ill.—A  
Transformer Technicians, Inc., 2608 N. Cicero Ave., Chicago 39, Ill.—A  
Transvision Inc., 460 North Ave., New Rochelle, N.Y.—A  
Trenton Transformer Corp., 822 E. State St., Trenton 4, N.J.—A  
Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif.—A  
Tri-Dex Co., Box 1207, Lindsay, Calif.—A,B  
Trutone Electronic Eng. Co., 812 N. Highland Ave., Los Angeles 38, Calif.—A,B  
TV Products Corp., 907 E. 23 St., Patterson 3, N.J.—A  
Union Electric Products Co., 24 Edison Pl., Newark 2, N.J.—A,B  
Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City, N.J.—A,B,C  
United Pressed Products Co., 741 W. Harrison St., Chicago 7, Ill.—M,N  
U. S. Electronics Corp., 275 Warren St., Lyndhurst, N.J.—B,C  
United Transformer Co., 150 Varick St., New York 13, N.Y.—A  
Utah Radio Products Co., 1123 E. Franklin St., Huntington, Ind.—A  
Vanguard Electronics Co., 3384 Motor Ave., Los Angeles 34, Calif.—B,C  
Vokar Corp., Dexter, Mich.—B,C  
West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—A  
Wheeler Insulated Wire Co., 150 E. Aurora St., Waterbury, Conn.—A  
Wilcox Research Corp., 840 N. La Brea Ave., Los Angeles 36, Calif.—A,B,C  
White Industries Inc., 421 W. 54 St., New York 19, N.Y.—A,B,C  
Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—B

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**TELE-TECH**  
& ELECTRONIC INDUSTRIES





Leonard Electric Products Co., Inc., 67 34th St., Brooklyn 32, N.Y.—A,D,H,M,N,P,R,S  
 LeFace Mfg. Co., 75-19 64 St., Glendale 27, N.Y.—A,J,R,S  
 Lynmar Engineers, 1432 N. Carlisle St., Phila. 21, Pa.—A  
 Mag-Electric Products Inc., 14405 Crenshaw Ave., Gardiner, Calif.—A,P,S  
 Magnetic Amplifiers, Inc., 632 Tinton Ave., N.Y. 55, N.Y.—P,R,S  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—K  
 Magnetics, Inc., Box 230-T, Butler, Pa.—P,R,S  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,D,F,G,H,I,J,K,M,N,P,Q,R,S  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—A,B,D,H,M,N  
 Mark Electronics Inc., 86 Shipman St., Newark 2, N.J.—F  
 Master Appliance Mfg. Co., 4th & Ontario Sts., Racine, Wisc.—A,J  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—A,B,D,H,M,N,P,R  
 May Eng'g. Co., 6055 Lankershim Blvd., N. Hollywood, Calif.—A,E,R,S  
 Mayfair Molded Products Corp., 4440 Elston Ave., Chicago 30, Ill.—B  
 MEASUREMENTS CORP., Boonton, N.J.—A  
 Mepco, Inc., 37 Abbebt Ave., Morristown, N.J.—A,J,L  
 Mercury Electro-Products, Inc., 622 W. Kinzie St., Chicago 10, Ill.—A,D,E,H,K,L,M,N  
 Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.—D,E,F,H,M,Q,R,S  
 Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—B  
 Mico Instrument Co., 80 Trowbridge St., Cambridge 38, Mass.—C,P  
 Microtran Div., Crest Labs., 84-11 Rockway Beach Blvd., Rockaway Beach, L.I., N.Y.—A,E,F,K,L,M,R,S  
 Mid-West Coil & Transformer Co., 1642 N. Halsted St., Chicago 14, Ill.—R,S  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—A,B,H,R  
 Miller Co., J.W., 5917 S. Main St., Los Angeles 3, Calif.—A,D,H,K,M,N,R,S  
 Milwaukee Transformer Co., 5231 N. Hopkins St., Milwaukee 9, Wisc.—S  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—A,D,M,N  
 Muter Co., 1255 S. Michigan Ave., Chicago 5, Ill.—A,D,E,F,H,M,O,Q  
 MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—B,N  
 National Coil Co., P. O. Box 1237, Sheridan, Wyo.—A,F,H,M,O  
 NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass.—A,B,H  
 NATIONAL MOLDITE CO., 1410 Chestnut Ave., Hillside 5, N.J.—B  
 Neomatic, Inc., 9010 Bellanca Ave., Los Angeles 45, Calif.—J,L  
 New Products Co., 1071 E. 54 St., Indianapolis 20, Ind.—B  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—A,L  
 North Hills Electric Co., Box 427, Great Neck N.Y.—A,B,E,F,H,M  
 Ogden Coil & Transformer Co., 2124 W. Carroll Ave., Chicago 12, Ill.—J,L,R,S  
 Ohmite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill.—S  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—A,G,I,J,L,P,R,S  
 Osborne Transformer Corp., 948 E. Lafayette Ave., Detroit 7, Mich.—S  
 Oxford Electric Corp., 3911 S. Michigan Ave., Chicago 15, Ill.—A,D,H,M,O,Q  
 Paramount Paper Tube Corp., 616 S. Lafayette St., Ft. Wayne 2, Ind.—B  
 Park Armature Co., 883 Boylston St., Boston 16, Mass.—A,J,L,R  
 PCA Electronics Inc., 2180 Colo. Ave., Santa Monica, Calif.—A  
 Peerless Electrical Products, Div. Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—P,R,S  
 Penn-Tran Corp., P. O. Box 149, Bellefonte, Pa.—A,E,L  
 Permeflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—O,R,S  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—D  
 PHOTOCIRCUITS CORP., Glen Cove, N.Y.—A,D,H,R  
 Pickering & Co., 309 Woods Ave., Oceanside, N.Y.—J,K  
 Pioneer Electronics Corp., 24 Saunders St., Salem, Mass.—A,F,M,R  
 Plastic Accessories, 91 Mercer St., New York 12, N.Y.—B  
 PRECISION PAPER TUBE CO., 2035 W. Charleston St., Chicago 47, Ill.—B  
 PRINTLOID, INC., 93 Mercer St., New York 12, N.Y.—B  
 Q. L. C. Corp., 10 Aubrey St., Summit, N.J.—A,D,H,M  
 Quality Components, Inc., St. Marys, Pa.—B  
 Quam-Nichols Co., 33 Pl. & Cottage Grove Ave., Chicago 16, Ill.—Q  
 Radio Coils, 1519 W. Devon Ave., Chicago 26, Ill.—A,D,F,H,L,M  
 Radio Cores, Inc., 9540 Tulley Ave., Oaklawn, Ill.—A,B  
 RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—A,D,E,F,H,M,R,S  
 Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill.—A,H,M,P,R,S  
 Radio Music Corp., 84 S. Water St., Port Chester, N.Y.—K,R,S  
 Radio TV Products Corp., Grass Lakes, Mich.—A,D,H,M,R  
 Railway Communications Inc., Raywood, Mo.—A,P  
 Randall, Inc., Douglas, 102 High St., Westerly, R.I.—A,C,I,J,L,M,N,R,S  
 RAYPAR INC., 1500 W. Addison St., Chicago 34, Ill.—A,D,E,F,H,M,P,Q,R,S  
 RAYTHEON MFG. CO., Waltham 54, Mass.—E,H,P,R,S  
 Redman Electronics Corp., 92 Prospect St., Thompsonville, Conn.—A,D,F,H,M,N  
 Reliable Spring & Wire Forms Co., 3167 Fulton Rd., Cleveland 9, Ohio—A,M  
 Remco Mfg. Co., 545 N. LaSalle St., Chicago 10, Ill.—A,J  
 Research Instrument Co., 233 Broadway, New York 7, N.Y.—A,P,R,S  
 Rich Electronics, Inc.—212 N.W. 8 Ave., Miami 36, Fla.—A,N  
 R.K. Mfg. Co., P. O. Box 112, Marion, Ill.—R,S  
 Rola Co., 2530 Superior Ave., Cleveland 14, Ohio—F,O  
 Rollins Corp., Lewes, Del.—R,S  
 Ross Mfg. Co., 2405 Armitage Ave., Chicago, Ill.—A,D,E,H,M  
 Sag Harbor Industries, Sag Harbor, N.Y.—A,G,J,L  
 Saratoga Industries, Ballston Ave., Saratoga Springs, N.Y.—A,J,L,P,R,S  
 Scientific Assembly Co., 65 Hope St., Brooklyn 11, N.Y.—A,H,M  
 Scientific Coil Co., 5619 Broadway, Chicago 40, Ill.—A,D,F,H,M  
 SCINTILLA MAGNETO DIV., BENDIX AVIATION CORP., Sidney, N.Y.—I  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—A,B,D,H,K,L,M  
 Senn Corp., New Augusta, Ind.—E  
 Sherman Industrial Electronics Co., 5050 Washington Ave., Belleville, N.J.—G  
 Sickles Div., F.W., General Instrument Corp., P. O. Box 330, Chicopee, Mass.—A,D,E,F,H,M,N,R  
 Sightmaster Corp., 111 Cedar St., New Rochelle, N.Y.—I  
 Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—A,B,I,J,K  
 SNC Mfg. Co., P. O. Box 277, Oshkosh, Wisc.—R,S  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—J,P,R,S  
 Spartan Radio TV 2400 E. Ganson St., Jackson, Mich.—A,D,F,H,J,L,M,N,Q,R,S  
 Specialties, Inc., Skunks Misery Rd., Syosset, L.I., N.Y.—A,P,R,S  
 SPEER RESISTOR DIV., SPEER CARBON CO., St. Marys, Pa.—B  
 Spera Electronics Labs., 37-10 33 St., L.I.C., N.Y.—N  
 Square Root Mfg. Corp., 391 Saw Mill River Rd., Yonkers, N.Y.—A,D,E,F,H,M,N,P,R,S  
 STACKPOLE CARBON CO., St. Marys, Pa.—B  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—A,D,E,F,G,H,I,J,K,M,N,P,R,S  
 Standard Electrical Products Co., 2240 E. 3 St., Dayton 3, Ohio—J,L,P,R,S  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—D,N,R,S  
 Standard Winding Co., 44 Johnes St., Newburgh, N.Y.—A,B,C,D,E,F,G,H,I,J,K,L,M,N,R,S  
 Stanwyck Winding Co., P. O. Box 70, Newburgh, N.Y.—D,F,H,K,M,N,R,S  
 Stevens Mfg. Co., Geo., 6022 N. Rogers Ave., Chicago 30, Ill.—C  
 Stone Paper Tube Co., Washington 17, D.C.—B  
 Stromberg-Carlson Co., Rochester 3, N.Y.—A,L,O,P  
 STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa.—R  
 Summit Coil Co., 67 Union Pl., Summit, N.J.—A,D,H,M,N  
 Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—A,C,R,S  
 Syntonic Instruments, Inc., 100 Industrial Rd., Addison, Ill.—E,F,Q  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,C,D,E,K,L  
 TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—Q  
 Telectron Co., 4019 Prospect Ave., Cleveland 3, Ohio—A,E,M,Q  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—M  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—A,B,C,D,H,M,N,O,R  
 Tel-Rad Mfr. Co., 7 Madison St., Fennimore, Wisc.—E,Q  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—A,B,F,L,R,S  
 THOR CERAMICS, INC., 225 Belleville Ave., Bloomfield, N.J.—B  
 Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—I  
 Todd-Tran Corp., 156 Gramatan Ave., Mount Vernon, N.Y.—E,F,G,S  
 Torocoil Co., 1374 Mobile Ct., St. Louis 10, Mo.—P  
 Torwico Electronics, 967 Frelinghuysen Ave., Newark 5, N.J.—P,R,S  
 Toys & Spec. Inc., 622 W. Kinzie St., Chicago 10, Ill.—A,D,H,K,M,N  
 Transformer Engineers, 161 E. Calif. St., Pasadena 1, Calif.—E  
 Transformer Mfrs. Inc., 850 W. Weed St., Chicago 22, Ill.—O,Q  
 Transformer Technicians, Inc., 2608 N. Cicero Ave., Chicago 39, Ill.—R,S  
 Transvision, Inc., 460 North Ave., New Rochelle, N.Y.—H  
 Trenton Transformer Corp., 822 E. State St., Trenton 4, N.J.—S  
 Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif.—F,O,P,Q,R,S  
 Tri-Dex Co., P. O. Box 1207, Lindsay, Calif.—A,E,H,J,K,L,M,P,R,S  
 Trutone Electronic Eng'g. Co., 812 N. Highland Ave., Los Angeles 38, Calif.—M  
 TV Labs, Inc., 5045 W. Lake St., Chicago 44, Ill.—A,E,J,O,P,Q  
 T V Products Corp., 907 E. 23 St., Paterson 3, N.J.—F  
 Union Electric Products Co., 24 Edison Pl., Newark 2, N.J.—A,J,L,O,R,S  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—A,B,D,E,F,G,H,I,J,K,L,M,N,P,Q,R,S  
 United Pressed Products Co., 741 W. Harrison St., Chicago 7, Ill.—D,F,H,M,N  
 U. S. Electronics Corp., 275 Warren St., Lyndhurst, N.J.—A,D,E,F,G,H,I,J,K,L,M,N,P,R,S  
 U.S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—B  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—P,R,S  
 Universal Mfg. Co., 404 Hillside Ave., Hillside, N.J.—P  
 Universal Winding Co., P.O. Box 1605, Providence 1, R.I.—C  
 Univex Corp., 102 Warren St., New York 7, N.Y.—A,R  
 Utah Radio Products Co., 1123 E. Franklin St., Huntington, Ind.—I,J,O,R,S  
 Vanguard Electronics Co., 3384 Motor Ave., Los Angeles 34, Calif.—A,D,F,H,L,M,N,P,R  
 VECTRON, INC., 400 Main St., Waltham 55, Mass.—P  
 Voker Corp., Dexter, Mich.—A,H,M,N  
 Wasworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—A,B,F  
 Waldom Electronics, Inc., 911 N. Larrabee St., Chicago 10, Ill.—O  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—A,D,M  
 Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.—C  
 Wheeler Insulated Wire Co., 150 E. Aurora St., Waterbury, Conn.—A,I,J,K,L,Q,R,S  
 White Industries Inc., 421 W. 54 St., New York 19, N.Y.—A,H,R,S  
 Wilcox Research Corp., 340 N. La Brea Ave., Los Angeles 36, Calif.—A,D,H,I,M,N,R  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—A,B,M  
 Woodward-Schumacher, 1725 W. North Ave., Chicago 22, Ill.

**19—COATINGS, LUBRICANTS & CHEMICALS**

Adhesives ..... A  
 Cement ..... B  
 Coil dope ..... C  
 Enamels ..... D  
 Fluid Flux ..... E  
 Graphite ..... F  
 Impregnating compounds ..... G  
 Insulating compounds ..... H  
 Luminescent chemicals ..... I  
 Marking inks ..... J  
 Miscellaneous chemicals ..... K  
 Paint ..... L  
 Paint, conductive ..... M  
 Paste flux ..... N  
 Phosphorescent chemicals ..... O  
 Pitch ..... P  
 Protective coatings ..... Q  
 Resins ..... R  
 Rubber, conductive ..... S  
 Sealers, protective ..... T  
 Silicones ..... AB  
 Solvents ..... U  
 Special lubricants ..... V  
 Vacuum greases ..... W  
 Varnish ..... X  
 Waterproofing compounds ..... Y  
 Wax ..... Z  
 Wrinkle Finish ..... AA

Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N.Y.—B,J,U  
 Acheson Colloids Co., Div. Acheson Ind. Inc., 1950 Washington Ave., Port Huron, Mich.—F,J,K,M,V  
 Aeromark Co., 9 Morrell St., Elizabeth 4, N.J.—J  
 AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—G  
 Anchor Metal Co., 244 Boerum St., Brooklyn 6, N.Y.—E,N  
 Advanced Vacuum Products, Inc., 22 Liberty St., Stamford, Conn.—T

**20—COMMUNICATION SYSTEMS**



**Aircraft** ..... A  
**Airport traffic control** ..... B  
**Carrier current** ..... C  
**Commercial** ..... D  
**Facsimile** ..... E  
**Induction** ..... F  
**Marine** ..... G  
**Microwave** ..... H  
**Multiplex** ..... I  
**Portable** ..... J  
**Railroad** ..... K  
**Single sideband** ..... P  
**Speech scrambling** ..... K  
**Telemetering** ..... L  
**Teletype** ..... M  
**Vehicular** ..... N

Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J.—G  
 Akron Rubber Co., 53 Warren St., New York 7, N.Y.—H,Q,S,T,AB  
 Allied Asphalt & Mineral Corp., 217 Broadway, New York, N.Y.  
 Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y.—K  
 American Chemical Paint Co., Ambler, Pa.—E,N,Q,V  
**AMERICAN PHENOLIC CORP.**, 1830 S. 54th Ave., Chicago 50, Ill.—B,C,AB  
 American Products Mfg. Co., 8127 Orlander St., New Orleans 18, La.—A,G,H,X  
 American Solder & Flux Co., 2152 E. Norris St., Philadelphia 24, Pa.—E,N,Q  
 Armstrong Cork Co., Lancaster, Pa.—A,B,H,Q,T  
 Bakelite Co., Div. Union Carbide & Carbon Corp., 30 E. 42 St., New York 17, N.Y.—A,G,H,Q,R,T,X,Y,AB  
 Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.—W  
 Biggs Co., Carl H., 2255 Barry Ave., Los Angeles 64, Calif.—A,B,C,G,H,Q,T,X,Y,Z  
 Biwax Corp., 3445 Howard St., Skokie, Ill.—G,H,P,Y,Z  
 Blaco Mfg. Co., 6541 Euclid Ave., Cleveland 3, Ohio—A,G,Q  
 Borthig Co., George C., P.O. Box 115, E. Rutherford, N.J.—A,D,G,H,Q,T,X,Y,Z  
 Boruski, Jr., Ernest F., 162 W. 54 St., New York 19, N.Y.—G,H,R  
 Bram Chemical Co., 826 65 Ave., Philadelphia 26, Pa.—G,I,K,O,AB  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—E,N  
**BURKE & JAMES**, 321 S. Wabash Ave., Chicago 4, Ill.—Q  
 Burndy Eng'g. Co., Norwalk, Conn.—V  
 Chemical Electronics Corp., Irvington N.Y.—U  
 Ciba Co., 627 Greenwich St., New York 14, N.Y.—A,G,H,Q,R,T  
 Communication Products Co., Marlboro, N.J.—B  
 Conn. Hard Rubber Co., 407 East St., New Haven 9, Conn.—AB  
 Consolidated Vacuum Corp., 735 Ridge Rd., W., Rochester 3, N.Y.—W  
 Continental Diamond Fibre Co., Newark, Del.—AB  
 Cox & Co., 115 E. 23rd St., New York, New York—A,B  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—A,B,I,O  
 DeMent Labs., New Flidner Bldg., Portland 5, Ore.—I,O  
 Dielectric Materials Co., 5315 N. Ravenswood Ave., Chicago 40, Ill.—AB  
 Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.—E,K,N,U  
 DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.—J,U,V  
 Dolph Co., John C., Monmouth Junction, N.J.—A,D,G,H,Q,T,X,Y,Z  
 Dow Corning Corp., P.O. Box 592, Midland, Mich.—H,Q,R,V,W,X,AB  
 DuPont de Nemours & Co., E.L. N.W. cor. 10th & Market Sts., Wilmington 98, Del.—A,D,I,L,M,U,X  
 Durez Plastics & Chemicals, 1926 Walck Rd., N. Tonawanda, N.Y.—G,Q,R  
 Electrochemical Industries, Jacques St., Worcester 3, Mass.—M  
 Electro-Technical Products, Div. Sun Chemical Corp., 113 E. Centre St., Nutley, N.J.—H,AB  
 Emerson & Cuming, 869 Washington St., Canton, Mass.—A,G,H,M,Q,R,Y,AB  
 Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, R.I.—J  
 Fidelity Chemical Products Corp., 470 Frelinghuysen Ave., Newark 5, N.J.—U,X  
 Forman Co., B. G., 238 William St., New York 38, N.Y.—G,H,Q,R,T  
 Freeport Sulphur Co., Port Sulphur, La.—K  
**Gates & Co., Geo. W., Hempstead Turnpike & Tumble Ave., Franklin Sq., L.I. N.Y.—O**  
**General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—A,B,C,D,E,F,G,H,I,K,L,M,N,O,Q,T,U,V,X,Y,AA**  
**GENERAL ELECTRIC CO.**, Chemical Div., 1 Plastics Ave., Pittsfield, Mass.—B,G,H,R,X,AB  
 Glyco Products Co., 26 Court St., Brooklyn 2, N.Y.—G,H,Q,T,Y,Z  
 Goldsmith Bros., Smelting & Refining Co., 111 N. Wabash Ave., Chicago 2, Ill.—E,K,N  
 Hayes Labs. Inc., C. W., 60 Chandler St., Springfield 4, Mass.—R,C,D,I,M,Q,T,AA  
 Helder Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J.—Q,AA  
 Hi-Q Div., Aerovox Corp., Olean, N.Y.—G  
 Hitest Chemical Corp., 722 64 St., Brooklyn, N.Y.—T  
 Houghton Labs., Inc., 322 Bush St., Olean, N.Y.—A,R,C,D,G,H,L,M,O,R,T,X,Y  
 Imperial Radar & Wire Corp., 4342 Bronx Blvd., New York 66, N.Y.—K  
 Industrial Devices, Edgewater, N.J.—T  
 Insul X Co., Water St., Ossining, N.Y.—B,D,G,H,K,L,Q,T,X  
 Insulation Mfrs. Corp., 565 W. Washington Blvd., Chicago 6, Ill.—A,B,G,H,Q,T,X,Y,AB  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—D,F,M,N  
 Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N.J.—D,G,H,L,Q,X  
 Javex, Box 646, Redlands, Calif.—G,H,M,Q,R,T,Y

Jeffrona Lab., 1629 N. Salina St., Syracuse, N.Y.—U  
 J F D Mfg. Co., 6101-16th Ave., Brooklyn 4, N.Y.—V  
 Johnson Mfg. Co., 600 1st Ave., N., Mount Vernon, Io.—E,N  
**KELLOGG CO., M.W., CHEMICAL MFG. Div., Ft. of Danforth Ave., Jersey City, N.J.—H,K,Q**  
 Kocour Co., 3504 W. 48 Pl., Chicago 32, Ill.—Y,Z  
 Lacquer & Chemical Corp., 214 40th St., Brooklyn 32, N. Y.—A,B,C,D,H,L,M,Q,T,U,X,Y,Z,AA  
 Lake Chemical Co., 3052 W. Carroll Ave., Chicago 12, Ill.—E,N,Q  
 Lawter Chemicals, Inc., 3550 Touhy Ave., Chicago 45, Ill.—I,J,L,O  
 Linick Chemical Co., 59 E. Madison St., Chicago 3, Ill.—A,E,K,M,N  
 Litton Eng'g. Labs., 1049 Britton Ave., San Carlos, Calif.—W  
 Lukens Steel Co., Coatesville, Pa.—Q,R,AB  
 Mackay Inc., A.D., 198 Broadway, New York 38, N.Y.—K,O  
**MELPAR, INC.**, 452 Swann Ave., Alexandria, Va.—R  
**Merix Chemical Co.**, 1021 E. 55 St., Chicago 15, Ill.—H,K,M,Q,S,T,U,V,Z  
**MICO INSTRUMENT CO.**, 80 Trowbridge St., Cambridge 38, Mass.—E,N  
 Micro-Circuits Co., New Buffalo, Mich.—A,F,H,L,M,Q,S,T  
 Minn. Mining Mfg. Co., St. Paul 6, Minn.—R  
 Minnesota Rubber & Gasket Co. 3630 Wooddale Ave., Minneapolis 16, Minn.—Q,S,AB  
 Mitchell Rand Companies, 51 Murray St., New York 7, N.Y.—G,H,P,R,X,Y,Z,AB  
 Molding Specialists, Inc., 52 Islin St., Yonkers 2, N.Y.—G,R  
 Mover Co. C. P., 908 Chicago Ave., Chicago 22, Ill.—A,B,C  
 National Coil Co., P. O. Box 1237, Sheridan, Wyo.—Q  
 National Lead Co., 111 Broadway, New York 6, N.Y.—E,L,N,X  
 National Research Corp., Equipment Div., 70 Memorial Dr., Cambridge 42, Mass.—Q,W  
 National Vulcanized Fibre Co., Md. Ave. & Berch St., Wilmington 99, Del.—AB  
 Neo-Sil Corp., 26 Cornelison Ave., Jersey City 4, N.J.—A,B,F,H,S,Y  
 Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.—K  
 Nye, Inc., Wm. F., P. O. Box 927, New Bedford, Mass.—V  
 Paragon-Revolute Corp., 77 South Ave., Rochester 4, N.Y.—J  
 Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill.—A,B  
 Philadelphia Quartz Co., 1146 Public Ledger Bldg., Phila. 6, Pa.—A,K  
 Phillips Mfg. Co., 2816 Aldrich Ave., S., Minneapolis 8, Minn.—E  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—I,O  
 Ramsell Mfg. Co., 420 Market St., San Francisco, Calif.—Q,T  
 Randolph Products Co., 13th St., Carlstadt, N.J.—D,L,Q,T,AA  
 Reilly Tar & Chemical Corp., 1615 Merchant Bank Bldg., Indianapolis, Ind.—D,P,Q,Y  
 Rollon Rubber Products, Inc., 1805 Jerome Ave., Bronx 58, N.Y.—S,AB  
 Ruby Chemical Co., 68 McDowell St., Columbus 8, Ohio—E,N  
 Sa-T-Flux Co., Box 64, Collegeville, Pa.—E,N  
 Sauereisen Cements Co., 1045 N. Canal St., Pittsburgh 15, Pa.—A,B,C,G,H,Q,T,X  
 Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—G,H  
 Standard Metals Corp., 262 Broad St., N. Attleboro, Mass.—E  
**SUPERIOR FLUX & MFG CO.**, 1302 Ontario St., Cleveland 13, Ohio—E,K,N  
 St. Regis Paper Co., Paneltye Div., 230 Park Ave., New York, N.Y.—AB  
 Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.—AB  
 Switzer Bros., 4732 St. Clair Ave., Cleveland 3, Ohio—D,I,O  
 Taylor Fibre Co., Norristown, Pa.—AB  
 Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—K,R,U  
 Tempil Corp., 11 W. 25 St., New York 11, N.Y.—L  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—E,N,Y,AA  
 U.S. Radium Corp., 535 Pearl St., New York 7, N.Y.—I,O  
 Vacuum Metals Corp., 70 Memorial Dr., Cambridge 42, Mass.—T  
 Verflex Corp., 305 N. Jav St., Rome, N.Y.—AB  
 Vorac Co., Route 17 at Meadow Rd., Rutherford, N.J.—D,E,L,M,N,Q  
 White Rock Mfg. Co., White Rock, S.C.—L  
 William & Co. Willimantic, Conn.—H  
 Zophar Mills Inc., 112 26 St., Brooklyn 32, N.Y.—A,B,G,H,P,Q,T,Y,Z

Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—D,H,N  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—L  
 Aerolux Light Corp., 653 11 Ave., New York 36, N.Y.—D  
 Aeronautical Communications Equip., Inc., 3090 Douglas Rd., Miami 33, Fla.—A  
 Aeronautical Electronics, Raleigh-Durham Airport, P. O. Box 6043, Raleigh, N.C.—B  
 Aeronautical Radio Mfg. Co., 155 1st St., Mineola, N.Y.—A  
 Air Associates Inc., 511 Joyce St., Orange, N.J.—A,B,D,H  
 Aircraft Armaments, 4415 Reistertown Rd., Baltimore 15, Md.—L  
**AIRCRAFT RADIO CORP.**, Box 150, Boonton N.J.—A  
 Allied Int'l Inc., 230 Park Ave., New York 17, N.Y.—D,E,I  
**ALDEN PRODUCTS CO.**, 117 N. Main St., Brockton 64, Mass.—E  
**ALTEC LANSING CORP.**, 9356 Santa Monica Blvd., Beverly Hills, Calif.—B  
 American Communications Corp., 306 Broadway, New York 7, N.Y.—C,D  
 American Electronizing Corp., 2040 Colo. Ave., Santa Monica, Calif.—B,D,I,N  
 Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.—D,G,N  
 Applied Science Corp. of Princeton, P. O. Box 44, Princeton, N.J.—L  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—L  
 Audio & Video Products, 730 5 Ave., New York 19, N.Y.—E,L  
 Austin Co., 76 9 Ave., New York 11, N.Y.—L  
 Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—B,C,J  
 Babcock Radio Eng'g. Inc., 7942 Woodley Ave., Van Nuys, Calif.—D  
 Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio—L  
 Barber Labs., Alfred W., 32-44 Francis Lewis Blvd., Flushing 58, N.Y.—D  
 Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—C,D,I,K,M,N  
 Bassett, Inc., Rex, 1314 N.E. 17 Court, Fort Lauderdale, Fla.—G  
 Beam Instruments Corp., 350 5th Ave., New York 1, N.Y.—H  
 Bell Aircraft Corp., Buffalo 5, N.Y.—A  
 Bell Sound Systems, 555 Marion Rd., Columbus 7, Ohio—D  
 Bendix Aviation Corp., 11600 Sherman Way, N. Hollywood, Calif.—L  
**BENDIX RADIO DIV., BENDIX AVIATION CORP.**, Towson 4, Md.—A,J,N  
 Berger Communications, 109-01 72 Rd., Forest Hills, L.I., N.Y.—A,D,I  
**BOGART MFG CORP.**—315 Seigel St., Brooklyn 6, N.Y.—H  
 Bogen Co., David, 29 9th Ave., New York 14, N.Y.—D,I  
 Breleo Electronics Corp., 55 Vandam St., New York 13, N.Y.—G  
 Bristol Co., Waterbury 20, Conn.—L  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,C,E,K,L  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—C,H,I,N  
 Bunnell & Co., J.H., 81 Prospect St., Brooklyn 1, N.Y.—C,E,J,M  
 Carad Corp., 93 Leland Ave., San Francisco 28, Calif.—C  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—L  
 Century Electronics, Div. Century Metalcraft Corp., 14806 Oxnard, Van Nuys, Calif.—H  
 C.G.S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—H,M  
 Collins Radio Co., Cedar Rapids, Ia.—A  
 Communication Accessories Co., Hickman Mills, Mo.—C,J,M  
 Communication Devices Co., 2331 12 Ave., New York 27, N.Y.—A,B,D,I,K,N  
 Communications Corp., 300 Greco Ave., Coral Gables, Fla.—B,G,N  
 Conn. Marine Instrument Co., Essex, Conn.—G,N  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—D,M,N  
 Continental Electronics Ltd., 302 Oakland St., Brooklyn 22, N.Y.—M

CROSBY LABS., INC., Box 233, Robbins Lane, Hicksville, L.I., N.Y.—C,D,M,O,P  
 Crown Eng'g, 3821 Commercial N. E., Albuquerque, N.M.—L  
 Dayton Aviation Radio & Equip., Dayton Municipal Airport, Vandalia, Ohio—A  
 Dean Electronics, 35 5th Ave., B'klyn. N.Y.—I  
 DeMornay-Bonardi Inc., 3223 Burton Ave., Burbank, Calif.—H  
 Dollar Co. Robert, Communications Equip. Div., 50 Drumm St., San Francisco, Calif.—M  
 DUMONT LABS. INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—N  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—A,B,D,G,H,I,J,N  
 ELECTRICAL TOWER SERVICE, 206 S. Washington St., Peoria 2, Ill.—H  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—N  
 Electronic Eng'g. Co., 362 W. Bowery St., Akron 7, Ohio—N  
 Electronic Research Co., 11550 39 St., N. E., Seattle 55, Wash.—N  
 Electro-Mechanical Research, Inc., 64 Main St., Ridgefield, Conn.—L  
 Electro Vision Lab., 4227 Francis Lewis Blvd., Bayside 61, N.Y.—L  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—N  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—D  
 El-Tronics, Inc., 5th & Noble Sts., Phila. 23, Pa.—B,C,D,G  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—H  
 Eng'g. Research Assoc., Inc., Div., Remington Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—B,H,K  
 Erco Radio Labs., Stewart Ave., Garden City, N.Y.—B,D,G,M,N  
 Espey Mfg. Co., 528 E. 72nd St., New York 21, N.Y.—A,B,C,D,E,F,G,H,I,J,K,L,N  
 Executone Inc., 415 Lexington Ave., New York 17, N.Y.—D  
 Farmers Eng'g. & Mfg. Co., Irwin, Pa.—C,D  
 Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—A  
 Federal Telecommunication Labs., 500 Washington Place, Nutley, N.J.—C,D  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—A,B,C,H, J,O,P  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—C,D,I,J,N  
 Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.—G  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—A,B,C,D,H,I,L,N  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—B,D,G,N  
 Garod Radio Corp., 70 Washington St., Brooklyn 1, N.Y.—A,B  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—B,C,D,G,I  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—C,L  
 GENERAL ELECTRIC CO., Electronics Div., Syracuse, N.Y.—A,D,E,H,I,N,O  
 GENERAL PRECISION LAB., INC., 63 Bedford Rd., Pleasantville, N.Y.—H  
 General Railway Signal, 801 West St., Rochester 2, N.Y.—A,G,J  
 G & M Equip. Co., 7315 Varna Ave., N. Hollywood, Calif.—A,B,I,K,N  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—E  
 Hallicrafters Co., 4401 W. 5 Ave., Chicago 24, Ill.—D,I,J,M  
 HAMMARLUND MFG. CO., 460 W. 34 St., New York 1, N.Y.—D,L  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—C,D,F,I,J,L,M,N  
 Harvey-Wells Electronics, North St., Southbridge, Mass.—D,I,N  
 Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles, Calif.—I,N  
 Hogan Labs., Inc., 155 Perry St., New York 14, N.Y.—E  
 Hudson American Corp., 25 W. 43 St., New York, N.Y.—G  
 Ivanhoe Electronics Labs., 14238 S. LaSalle St., Chicago 27, Ill.—N  
 Int'l Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—A,D,L  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—A  
 Jefferson, Ray, 40 E. Merrick Rd., Freeport, N.Y.—G  
 Kaar Eng'g. Corp., 2995 Middlefield Rd., Palo Alto, Calif.—G,N  
 Kane Electronics Corp., 81 Willoughby St., Brooklyn 1, N.Y.—A,D,G  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—D,H  
 Kinetix Inst. Co., 902 Broadway, New York 10, N.Y.—L  
 KOLLSMAN INSTRUMENT CORP., 80-08 45 Ave., Elmhurst 73, N.Y.—A,D  
 Lavoie Labs., Inc., Margerville, N.J.—I,N  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—A,B,D,H,I,N  
 Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—C,G,H,K,L,M  
 Leonard Electric Products Co., Inc., 67 34 St., Brooklyn 32, N.Y.—H  
 Link Radio Corp., 152 W. 17 St., New York 11, N.Y.—D,G,I,N  
 Lynch Carrier Systems, Inc., 96 Jessie St., San Francisco 5, Calif.—C,K,L,M  
 Lysco Mfg. Co., 1401 Clinton St., Hoboken, N.J.—G,N

MAGNAVOX CO., Fort Wayne 4, Ind.—A  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—K  
 Marconi's Wireless Telegraph, 23 Beaver St., New York 4, N.Y.—A,B,G,N  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—G  
 Maxson Corp., W.L., 460 W. 34th St., New York 1, N.Y.—A,H  
 Metrotype Corp., 525 W. 76 St., Chicago 20, Ill.—L  
 MICROWAVE ASSOCIATES, 22 Cummington St., Boston 15, Mass.—H  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—B,I  
 Mitchell Industries, Box 17, Mineral Wells, Texas—A,I,J  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—D,G,I,N  
 Motorola Inc., 4545 W. Augusta Blvd., Chicago, Ill.—C,D,H,I,J,L,N,O  
 National Aeronautical Corp., 180 S. Main St., Ambler, Pa.—A  
 National Electronics Labs., 1713 Kalorama Rd., N.W., Washington 9, D.C.—N  
 Nestor Eng'g. Co., 24 Chestnut St., Rutherford, N.J.—J,M  
 N. American Aviation, 12214 Lakewood Blvd., Downey, Calif.—O  
 Northeastern Eng'g. Inc., So. Bedford St., Manchester, N.H.—E,I,L,M,N  
 Northern Radio Co., 147 W. 22 St., New York 11, N.Y.—G,O  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—B,L  
 N.R.K. MFG. & ENG'G. CO., 4601 W. Addison St., Chicago 41, Ill.—H  
 Oberline Ltd., 6411 Hollywood Blvd., Hollywood 28, Calif.—C  
 Orthon, 196 Albion Ave., Paterson, N.J.—B  
 Pacific Mercury TV Mfg. Co., 5955 Van Nuys Blvd., Van Nuys, Calif.—I  
 Pearce-Simpson, Inc., 3023 Coral Way, Miami 34, Fla.—G  
 Penn Industrial Instrument Corp., 4110 Haverford Ave., Phila. 4, Pa.—L  
 PHILCO CORP., Gov't & Industrial Div., 4700 Wissahickon Ave., Phila. 44, Penna.—H,O  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—D,E  
 Plastics & Electronics Co., Inc., 272 Northland Ave., Buffalo 8, N.Y.—I  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—H  
 Pratt, Albert, 1939 N. 18 St., Milwaukee 5, Wisc.—N  
 Press Wire Mfg. Co., 155 W. Main St., Rockville, Conn.—A,B,E,G,H,L,M  
 Radar-Electronics Inc., 229 W. 28 St., New York 1, N.Y.—A,I,L  
 RADIO CORP. OF AMERICA, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J. D,H,I,N,O  
 RADIO ENG'G. LABS., 36-40 37 St., L.I.C. 1, N.Y.—H  
 Radio Frequency Labs., Inc., Boonton, N.J.—M  
 Radiomarine Corp. of America, 75 Varick St., New York, N.Y.—G  
 RADIO RECEPTOR CO., 84 N. 9 St., Brooklyn 11, N.Y.—A,D  
 Radio Spec. Mfg. Co., 2023 S.E. 6 Ave., Portland 14, Ore.—D,N  
 Radiotron, Inc., Box Q, Melbourne, Fla.—L  
 Railway Communications Inc., Raytown, Mo.—C,J  
 RAYTHEON MFG. CO., Waltham 54, Mass.—B,G,H,O  
 Remco Mfg. Co., 545 N. La Salle St., Chicago 10, Ill.—D,L  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—A,G,H,I  
 Resdel Eng'r., 2351 Riverside Dr., Los Angeles 39, Calif.—A,H,L,N  
 Rich Electronics, Inc., 212 N.W. 8 Ave., Miami 36, Fla.—G  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—D  
 Rosen Eng'g. Products, Inc., Raymond 32nd & Walnut Sts., Phila. 4, Pa.—L  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—L  
 Slat & Associates, Claude C., 11370 W. Olympic Blvd., Los Angeles 64, Calif.—G  
 Smith-Meeker Eng'g. Co., 157 Chambers St., New York 7, N.Y.—A,D,G,J  
 Sonar Radio Corp., 3050 W. 21 St., Brooklyn 24, N.Y.—A,B,D,G,J  
 Southern Electric & Transmission Co., 3127 Holmes St., Dallas, Texas—C,H,L,M  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas  
 Sparton Radio TV, 2400 E. Ganson St., Jackson, Mich.—L  
 Specialty Assembling, 79 Clifton Pl., Brooklyn 38, N.Y.—A,I,N  
 Spera Electronics Labs., 37-10 33rd St., Long Island City, N.Y.—C,D,K,N  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—G  
 Stelma, Inc., 389 Ludlow St., Stamford, Conn. D M  
 Stratford Pen Corp., 44 W. 28 St., New York, N.Y.—A  
 Stromberg-Carlson Co., Rochester 3, N.Y.—C,D,G,I,J,N  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,C,G,H,K  
 TEJECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—D,L  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—A,D,G,H,N

Telescreen Corp., 36 Grove St., New Canaan, Conn.—H  
 Telex, 1633 Eustis St., St. Paul 1, Minn.—I  
 Times Facsimile Corp., 540 W. 58th St., New York 19, N.Y.—E  
 T.L.G. Electric Corp., 31 W. 27 St., New York 1, N.Y.—A,B,C,M  
 Torngren Co., C. W., 236 Pearl St., Somerville, Mass.—H  
 Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—A,B,D,G,H,I,K,M,N  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—A,L  
 U.S. Tower Co., 219 Union Trust Bldg., Petersburg, Va.—H  
 Univex, 102 Warren St., New York, N.Y.—A  
 Waveline, Passaic Ave., Caldwell, N.J.—H  
 Webster Electric Co., 1900 Clark St., Racine, Wisc.—D  
 Weisen Electric Co., 1221 Wade St., Cincinnati 14, Ohio—A  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—D,J,N  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—B,C,F,H,I,N  
 Western Sound & Electric Lab., 805 S. 5 St., Milwaukee 4, Wisc.—I  
 WESTINGHOUSE ELECTRIC CORP., 2519 Wilkens Ave., Baltimore 3, Md.—H,J,O  
 Weston Lab., Inc., Oak Hill Rd., Harvard, Mass.—H  
 Westrex Corp., 111 8 Ave., New York 11, N.Y.—K,M  
 Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.—H  
 Wheeler Insulated Wire Co., 150 E. Aurora St., Waterbury, Conn.—D  
 White Industries, 421 W. 54 St., New York 19, N.Y.—A  
 Wickes Eng'r. & Const. Co., 12 St. & Ferry Ave., Camden, N.J.—B,D,M,N  
 Wilcox Electric Co., 1400 Chestnut St., Kansas City 1, Mo.—A  
 Williams Ship-Radio Co., 4366 Mentone St., San Diego 7, Calif.—G

## 21—COMPUTERS

Analog ..... A  
 Analog-to-digital converters ..... G  
 Computer auxiliary equipment ..... H  
 Digital ..... B  
 Electronic ..... C  
 Input equipment ..... D  
 Output equipment ..... E  
 Memory drums ..... F

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena, Calif.—A,B  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—A,B,C  
 Aircraft Armaments, 4415 Reistertown Rd., Baltimore 15, Md.—A,B,C  
 American Electroengineering Corp., 2040 Colo. Ave., Santa Monica, Calif.—C  
 American Hydromath Corp., 145 W. 57th St., New York 19, N.Y.—A  
 American Machine & Foundry Co., 1085 Commonwealth Ave., Boston, Mass.—A,B,C  
 Anelex Corp., 53 State St., Boston 9, Mass.—A,B,C,D,E,H  
 Applegate Co., 1816 Grove St., Boulder, Colo.—D  
 Applied Science Corp. of Princeton, P. O. Box 44, Princeton, N.J.—A,B,C,D,E,H  
 Arlin Products, Inc., 13541 Auburn Ave., Detroit 23, Mich.—C  
 Arma Corp., Roosevelt Field, Garden City, N.Y.—A,B  
 Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, N.Y.—A,C  
 Atlas Metal Stamping Co., Castor & Kensington Aves., Phila 24, Pa.—C,D  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—B,C,D,E,H  
 Audio & Video Products Corp., 730 5th Ave., New York 19, N.Y.—D,E,F,H  
 Aurex Corp., 1117 N. Franklin St., Chicago 11, Ill.—F  
 Austin Co., 76 9th Ave., New York 11, N.Y.—A,B,C,D,E  
 Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif.—C  
 Benson-Lehner Corp., 2340 Sawtelle Blvd., Los Angeles 64, Calif.—A,B,C,D,E  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, INC., 2200 Wright Ave., Richmond, Calif.—A,B,C,E  
 Boeing Airplane Co., P. O. Box 3107 Seattle 14, Wash.—A  
 BOGART MFG. CORP., 315 Seigel, B'klyn, N.Y.—A  
 Bristol Eng'r. Corp., Lincoln & Pond Sts., Bristol Pa.—C,D,E  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio.—F  
 BURROUGHS ADDING MACHINE CO., 511 N. Broad St., Philadelphia 23, Pa.—B,C,D,E, F,H  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—A,B  
 Clary Multiplier Corp., 406 Junipero St., San Gabriel, Calif.—A,B,C,D,E  
 Codetypor Labs., 550 5th Ave., New York 19, N.Y.—C

Color TV Inc., 973 E. San Carlos Ave., San Carlos, Calif.—B,C  
 Computer Corp. of America, 149 Church St., New York, N.Y.—A  
 Computer Research, Hawthorne, Calif.—B  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—A,B,C,H  
 Corning Glass Works, P.O. Box 544, Corning, N.Y.—F  
 Curtiss Wright Corp., 631 Central Ave., Carlstadt, N.J.—A  
 Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md.—A,C  
 Detectron Co., 5631 Cahuenga Blvd., N. Hollywood, Calif.—C  
 Digital Instrument Co., 212 Almeria Ave., P.O. Box 1345, Coral Gables, Fla.—B,C  
 Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—D  
 Douglas Aircraft, Santa Monica, Calif.—H  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—A,C  
 Echert-Mauchly Div., Remington Rand Co., 2300 W. Alleghany Ave., Philadelphia 29, Pa.—B,H  
 Electro-Mechanical Research, Inc., 64 Main St., Ridgefield, Conn.—A  
 Electronic Associates, Long Branch, N.J.—A,D,E,H  
 Electronic Computer Corp., 265 Butler St., Brooklyn 17, N.Y.—B,H  
 Electrotech Corp., 15601 Arrow Hwy., Azusa, Calif.—C  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A,C  
 Eng'g. Research Associates, Div. Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—A,B,C,D,E,F,H  
 Ferranti Electric, Inc., 30 Rockefeller Plaza, New York 20, N.Y.—B,D,E,F  
 FORD INSTRUMENT CO., Div. Sperry Corp., 31-10 Thomson Ave., Long Island City 1, N.Y.—A,H  
 FREED ELECTRONICS & CONTROLS CORP., 200 Hudson St., New York 13, N.Y.—B,C  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—A  
 General Magnetics, Inc., 135 Bloomfield Ave., Bloomfield, N.J.—A  
 Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif.—D,E  
 Goodyear Aircraft Corp., Akron 16, Ohio—A  
 Gurly W., 514 Fulton St., Troy, N.Y.—D  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—A,B  
 Hanson-Gorrill-Biran, One Continental Hill, Glen Cove, N.Y.—A,D,E  
 Hogan Labs., Inc., 155 Perry St., New York 14, N.Y.—B  
 HUGHES AIRCRAFT, Culver City, Cal.—A,B,H  
 Industrial Control Co., Straight Path & Arlington Ave., Wyandanch, N.Y.—A  
 Industrial Electronic Engrs., 3973 Lanker-shim Blvd., N. Hollywood, Calif.—C,D,E,F  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—F  
 International Business Machines Co., 50 Broadway, New York, N.Y.—B,H  
 Int'l Telemeter Corp., 2000 Stoner Ave., Los Angeles 25, Calif.—B,C,H  
 iq Industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—B,C  
 Jacobs Instrument Co., 4718 Bethesda Ave., Bethesda 14, Md.—A,B,C,D,E,H  
 Kalbfell Labs., Inc., 1090 Morena Blvd., San Diego 10, Calif.—A,C,D  
 KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—A,B,C  
 Laboratory for Electronics, 75 Pitts St., Boston, Mass.—A,B,C  
 Land-Air, Inc., 440 W. Superior St., Chicago 10, Ill.—C,F  
 Las-Lab, 316 W. Saratoga St., Baltimore 1, Md.—A  
 Librascope Inc., 1607 Flower St., Glendale 1, Calif.—A,B,C,F  
 Logistics Research Inc., 141 S. Pacific Ave., Redondo Beach, Calif.—B,D,E,F  
 MacDonald Co., W.S., 33 University Rd., Cambridge 38, Mass.—B,F  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—F  
 Magnetics, Inc., Box 230-T, Butler, Pa.—D,F  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,B,C,D,E  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—C  
 Maxson Corp., W.L., 460 W. 34 St., New York 1, N.Y.—A,B,C  
 METPAR, 452 Swann Ave., Alexandria, Va.—A,C  
 Minnesota Electronics Corp., 47 W. Water St., St. Paul 1, Minn.—A,B,C  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—C  
 National Instrument Co., 23 E. 26 St., New York 10, N.Y.—C  
 Northeastern Eng'g. Corp., So. Bedford St., Manchester, N.H.—C  
 Oregon Corvek Co., 1005 N.W. 16th Ave., Portland, Ore.—A  
 Phila., Scientific Glass Co., 4 Eckard Ave., Abington, Pa.—C  
 Philbrick Researches, Inc., Geo. A., 230 Congress St., Boston 10, Mass.—A,C,D  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—B,C,D,E,F,H  
 Radar-Electronics Inc., 229 W. 28th St., New York 1, N.Y.—C



RAYTHEON MFG. CO., Waltham 54, Mass.—B,C,D,E,H  
 Resdel Eng'r., 2351 Riverside Dr., Los Angeles 39, Calif.—C  
 Reeves Instrument Corp., 215 E. 91 St., New York, N.Y.—A  
 Rich-Roth Labs., 1240 Main St., Hartford 3 Conn.—A,B,C  
 Rockwell Eng'r. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—C  
 Ruska Instrument Corp., 4607 Montrose Blvd., Houston 6, Texas—A  
 Seay Instrument Co., 6521 N. Lamar Blvd., Austin 5, Texas—A,C  
 Servo Corp. of America, 2020 Jericho Turnpike, New Hyde Park, L.I., N.Y.—A  
 Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y.—A  
 Shoup Eng'g. Co., 221 E. Cullerton St., Chicago 16, Ill.—F  
 Special Instruments Lab., 1003 Highland Ave., Knoxville, Tenn.—E  
 Specialties, Inc., Skunks Misery Rd., Syosset, L.I., N.Y.—A,C  
 Sperry Gyroscope Co., Great Neck, L.I., N.Y.—A,B,H  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—A,B,C  
 Streeter-Amet Co., 4101 Ravenswood Ave., Chicago 13, Ill.—A,B,C,D  
 Tally Co., 159 Carlton Ave., B'klyn, N.Y.—C  
 Tally Register Corp., 5300 14 Ave., NW Seattle 7, Wash.—D,E  
 Technitrol Eng'g. Co., 2751 N 4 St., Phila. 33, Pa.—B,C,F  
 Technology Instrument Corp., 53 Main St., Acton, Mass.—A  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—C  
 Telecomputing Corp., 133 E. Santa Anita Ave., Burbank, Calif.—D,E,G,H  
 Teleregister Corp., 157 Chambers St., New York 7, N.Y.—A,B,C,D,E,F,H  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—E  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—C  
 Tracelab, 130 High St., Boston 10, Mass.—B  
 Transmitter Equipment Mfg. Co., 345 Hudson St., New York 14, N.Y.—A,B,C  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—A,B,C,D,E,F  
 Underwood Corp., Park Ave. & 33rd St., New York, N.Y.—B,H  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—A,B,C  
 Videon Electronic Corp., 222 E. Ohio St., Indianapolis, Ind.—A  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—B,C,D,E,F,H  
 Wang Laboratories, 296 Columbus Ave., Boston 16, Mass.—B,E  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio—A,B,C

## 22—CONNECTORS

Connectors, anode ..... A  
 Connectors, antenna ..... B  
 Connectors, cable ..... C  
 Connectors, coaxial cable ..... D  
 Connectors, interlock ..... E  
 Connectors, jack & telephone ..... F  
 Connectors, microphone ..... G  
 Connectors, power ..... H  
 Connectors, pressurized ..... I  
 Connectors, R-F ..... J  
 Connectors, tube ..... K  
 Patch cords ..... L  
 Plugs ..... M

## TERMINALS & JACK PANELS

Jack Panels ..... N  
 Junction Boxes ..... O  
 Terminals ..... P

Aerolite Electronics Corp., 507 26 St., Union City, N.J.—A,B,C,F,G,K,L,M,N,O,P  
 Aeronautical Radio Mfg. Co. 155 1 St., Mineola, N.Y.—B,C,D,F,G,M,O  
 Airtron Inc., 1109 W. Elizabeth Ave., Linden, N.J.—D  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton, Mass.—A,B,C,D,E,F,G,H,K,L,M,N,O,P  
 Allied Industries, 1023 S. 21 St. Louisville 10, Ky.—D,J  
 AMERICAN LAVA CORP., Chattanooga 5, Tenn.—P  
 American Machine & Fdry. Co., Electronics Div., 1085 Commonwealth Ave., Boston, Mass.—O

AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—A,B,C,D,G,H,I,J,L,M,P  
 American Radio Hardware Co., 152 Mac-Quisten Pkwy. S., Mt. Vernon, N.Y.—B,C,D,F,G,L,M,I,J,P  
 ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—B,D  
 Arey Machine Co., 38 Long Ave., Hillside 5, N.J.—C,E,F,G,H,L,M,N,O  
 Associated Eng'g. Corp. of Boston, 38 Euston Rd., Brighton 35, Mass.—H,L,M  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—C,H  
 Audio Equip. Sales, 153 W. 33 St., New York 1, N.Y.—F,G,L,M,N  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—L,M,N,P  
 Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—F,G,K,M  
 Automatic Metal Products Corp., 315 Berry St., Brooklyn 11, N.Y.—B,C,D,I,J,M  
 Baer Co., N. S., 1 Montgomery St., Hillside 5, N.J.—N  
 BENDIX AVIATION CORP., SCINTILLA MAGNETO DIV., Sherman Ave., Sidney, N.Y.—C  
 Birnbach Radio Co., 145 Hudson St., New York 13, N.Y.—F,M  
 Blaco Mfg. Co., 6541 Euclid Ave., Cleveland 3, Ohio—B  
 Blair Co., J. P., 89 Union St., Mineola, N.Y.—D  
 Blazon Mfg., 6021 Dempster St., Morton Grove, Ill.—B,J  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—B,C,J  
 BREEZE CORP., 41 S. 6 Ave., Newark, N.J.—D,H,N  
 Brecco Electronics Corp., 55 Vandam St., New York 13, N.Y.—F,G  
 Brillhart Plastic Corp., Box 31, Old Country Rd., Mineola, L.I., N.Y.—P  
 Brookhaven Electronics Corp., 450 7 Ave., New York 1, N.Y.—B,C,D,I,J,M  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—B,D,M,P  
 Buchanan Electrical Products Corp., 236 Route 22, Hillside, N.J.—C,P  
 BUD RADIO INC., 2118 E. 55 St., Cleveland 3, Ohio—C,G,F,M,N,O  
 Buggie & Co., H. H., 726 Stanton St., Toledo 4, Ohio—C,D,F,H,I,J,L,M  
 Burndy Eng'r. Co., Norwalk, Conn.—C,D,H,I,P  
 Cambridge Thermionic Corp., 445 Concord Ave., Cambridge 38, Mass.—P  
 Camburn Inc., 32-40 57 St., Woodside 77, N.Y.—B,C,D,H,M  
 Cannon Electric Co., 3209 Humboldt St., Los Angeles 31, Calif.—C,D,F,G,H,I,L,M,P  
 Capitol Stage Lighting Co., 527 W. 45 St., New York 36, N.Y.—C,M,O  
 Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—H,M  
 Carter Parts Co., 213 Institute Pl., Chicago 10, Ill.—F,G,N  
 Chester-Morton Electronics Corp., 10 St. & Morton Ave., Chester, Pa.—D,J,L  
 Chicago Tool & Eng'g. Co., 8383 S. Chicago Ave., Chicago 17, Ill.—B,C  
 CINCH MFG. CO., 1026 S. Homan Ave., Chicago 24, Ill.—A,B,C,E,F,G,H,J,K,M,N,O,P  
 CINEMA ENG'G. CO., Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—F,G,L,M,N,P  
 Circle Mfg. Co., P.O. Box 152, Little Falls, N.J.—D  
 Citation Products Co. 233 E. 146 St., New York 51, N.Y.—F,M,N,P  
 Coaxial Connector Co., 35 N. 2 Ave., Mt. Vernon, N.Y.—B,C,D,I,J,L,M,N,O  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—F,G,M,N,O,P  
 CONSTANTIN & CO., L. L., Rt. 46, Lodi, N.J.—M  
 Continental Connector Corp., 30-30 Northern Blvd., Long Island City 1, N.Y.—I,L,M,P  
 Continental Electronics Ltd., 302 Oakland St., Brooklyn 22, N.Y.—M  
 Cordware Eng'g., 2195 42 Ave., Oakland 1, Calif.—B  
 Costelow Co., J. A., 125 Kansas Ave., Topeka, Kan.—C,D,F,G,H,I,J,L,M,N,O,P  
 Cubic Corp., 2841 Canon St., San Diego 6, Calif.—J  
 Cutler-Hammer Inc., 436 N. 12 St., Milwaukee 1, Wisc.—E,M  
 DAGE ELECTRONICS CORP., 69 N. 2 St., Beech Grove, Ind.—C,D  
 Dante Electric Mfg. Co., P. O. Box 6, Bantam, Conn.—B,C,H,P  
 Decatur Electronic Industries, 1620 Decatur St., Brooklyn 27, N.Y.—E,L,N,O  
 DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N.Y.—C,E,H,I,M  
 Dialight Corp., 60 Stewart Ave., Brooklyn 37, N.Y.—G  
 Diamond Mfg. Co., 7 North Ave., Wakefield, Mass.—D,F,J  
 Dorn Equip. Corp., 88 Broad St., Boston 10, Mass.—L  
 Dorne & Margolin, 30 Sylvester St., Westbury, N.Y.—B  
 Eagle Electric Mfg. Co., 23-10 Bridge Plaza, S., Long Island City, N.Y.—M  
 EBY INC., H. H., 4700 Stenton Ave., Philadelphia 44, Pa.—C,E,F,H,M,P  
 EITEL-McCULLOUGH, INC., 798 San Mateo Ave., San Bruno, Calif.—K  
 Elco Corp., 190 W. Glenwood Ave., Philadelphia, Pa.—C,E,F,G,H,K,L,M,P

Electromatic Mfg. Corp., 88 University Pl., New York 3, N.Y.—C  
Electro Precision Prod. Inc., 119 St. & 20 Ave., College Point, N.Y.—D,I,J  
Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—P  
Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis, Mo.—J  
Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—M,N,O  
Ericson Mfg. Co., 5209 Euclid Ave., Cleveland 3, Ohio—M  
FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—C  
Federal Screw Products Inc., 224 W. Huron St., Chicago 10, Ill.—P  
Flader Inc., Frederic, 583 Division St., N. Tonawanda, N.Y.—B  
Garde Mfg. Co., Providence 3, R.I.—P  
Gee-Lar Mfg. Co., 1330 10 Ave., Rockford, Ill.—B,M  
General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—A,B,C,E,F,P  
GENERAL CERAMICS & STEATITE CORP., Keasbey, N.J.—P,AAA  
GENERAL ELECTRIC CO., MONOWATT Dept., 95 Hathaway St., Providence 7, R.I.—I,O  
GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—C,D,J,L,M,P  
GENERAL R-F FITTINGS Co., 702 Beacon St., Boston 15, Mass.—B,C,I,J  
Glaser-Steers Corp., 2 Main St., Belleville, N.J.—C,M  
Hallett Mfg. Co., 1601 W. Florence Ave., Inglewood, Calif.—C,D  
Heldor Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J.—P  
HERMETIC SEAL PRODUCTS CO., 33 S. 6 St., Newark 7, N.J.—M,P  
Hubbell Inc., Harvey, State St. & Bostwick Ave., Bridgeport, Conn.—E,F,G,M  
Hughes & Phillips, P. O. Box 686, Encino, Calif.—O  
Ideal Industries, 3316 Park Ave., Sycamore, Ill.—C  
Imperial Radar & Wire Co., 4342 Bronx Blvd., New York 66, N.Y.—B,C,D  
Industrial Devices, Edgewater, N.J.—J,P  
INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—B,C,F,G,M, O,P  
Janco Corp., 3111 Winona Ave., Burbank, Calif.—B,F,L,O  
Javex, Box 646, Redlands, Calif.—B,M,O,P  
Jerrold Electronics Corp., 26 & Dickinson Sts., Philadelphia 46, Pa.—C,D  
J F D Mfg. Co., 6101 16 Ave., Brooklyn 4, N.Y.—B,F,G,M  
Jiffy Clip Mfg. Co., 128 Clinton Ave., Huntington, N.Y.—P  
JOHNSON CO., E. F., Waseca, Minn.—C,D, K,P  
Johnson & Hoffman Mfg. Co., 31 E. 2 St., Mineola, L.I., N.Y.—P  
JONES DIV., HOWARD B. CINCH MFG CORP., Chicago 24, Ill.—C,F,M  
Joy Mfg. Co., 4235 Clayton Ave., St. Louis 10, Mo.—H  
Karp Metal Products Co., 211 63 St., Brooklyn, N.Y.—O  
KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—N  
Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—A,F,G,M,N,P  
Kings Electronics Co., 40 Marbledale Rd., Tuckahoe, N.Y.—C,D,J  
Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—B,D,J  
Kliegl Bros., 321 W. 50 St., New York 19, N.Y.—H,L,M  
Kelton Electric Mfg. Co., 123 N. J. R. R. Ave., Newark 5, N.J.—C,O,P  
Kulka Electric Mfg. Co., 633 S. Fulton Ave., Mt. Vernon, N.Y.—M,P  
Land-Air, Inc., 440 W. Superior St., Chicago 10, Ill.—B,D,M  
Lapp Insulator Co., 27 Gilbert St., Le Roy, N.Y.—J  
Larson Co., C. O., Ave. G & C & N. W. RR., Sterling, Ill.—B  
LEGRY CO., S. 158 W. 99 St., New York 25, N.Y.—F,G,M,N,P  
Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—L,M,N  
Lundey Associates, 694 Main St., Waltham 54, Mass.—P  
Lynn Electronic Research Co., 9 W. Magnolia Blvd., Burbank, Calif.—E,M,N,P  
Malco Tool & Mfg. Co., 4025 W. Lake St., Chicago 24, Ill.—P  
MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—F,G,M  
Mandex Mfg. Co., 2608 W. 16 St., Chicago 8, Ill.—A,C,E,K,N,P  
Mark Products Co., 3547-49 Montrose Ave., Chicago 18, Ill.—B  
Marlin Electric Co., 1750 N. Campbell Ave., Chicago 47, Ill.—M,P  
Mendelsohn Speedgun Co., 457 Bloomfield Ave., Bloomfield, N.J.—D,J  
Methode Mfg. Corp., 2021 W. Churchill St., Chicago 47, Ill.—C,K,M  
Microdot Div., Felts Corp., 1826 Fremont Ave., S. Pasadena, Calif.—B,C,D,G,H,I,M  
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—J,M  
Molded Insulation Co., 335 E. Price St., Philadelphia 44, Pa.—F,G,I,M,O,P  
Morse Co., F. W., 1300 Soldiers Field Rd., Boston, Mass.—H

Mosley Electronics, Inc., 8622 St. Charles Rock Rd., St. Louis 14, Mo.—B  
MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—P  
NATIONAL CO., 61 Sherman St., Malden 48, Mass.—A,K,P  
Neomatic, Inc., 9010 Bellanca Ave., Los Angeles 45, Calif.—K,M  
Neo-Sil Corp., 26 Cornelson Ave., Jersey City 4, N.J.—I,M,P  
Neptune Electronic Co., 433 Broadway, New York 13, N.Y.—D,E,F,G,N,O,P  
Perinoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—F,G  
Perma-Power Co., 4727 N. Damen Ave., Chicago 25, Ill.—A,P  
Petroff, P. A., 127 Water St., New York 5, N.Y.—B,C,F,G,M  
Pioneer Electronics Corp., 24 Saunders St., Salem, Mass.—C  
Pix Mfg. Co., 22 Bedford St., Newark 3, N.J.—C,P  
Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—B  
Precision Associates, 354 Cumberland St., Brooklyn 17, N.Y.—N,O  
PRODELIN, 307 Bergen Ave., Kearny, N.J.—D  
Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—B  
Rajah Co., 53 Locust Ave., Bloomfield, N.J.—P  
RAYPAR INC., 7800 W. Addison St., Chicago 34, Ill.—E  
RADIO CORP. OF AMERICA, RCA VICTOR DIV., Eng'g. Products Div., Camden 2, N.J.—D,G,L,N  
RCA TUBE DEPT., 415 S. 5 St., Harrison, N.J.—A,K  
Remler Co., 2101 Bryant St., San Francisco 10, Calif.—G,H,I,L,M  
Research Instrument Co., 233 Broadway, New York 7, N.Y.—N,P  
Rhode Island Insulated Wire Co., 50 Burnham Ave., Cranston, R.I.—C  
Rich Electronics Inc., 212 N. W. 8 Ave., Miami 36, Fla.—O  
Riverside Metal Co., 1 Pavilion Ave., Riverside, N.J.—I  
Rodale Mfg. Co., Emmaus, Pa.—M  
Rofan Co., Topsfield, Mass.—B,C,D,F,G,H,I,J, L,M,N,P  
Runzel Cord & Wire Co., 4723-31 Montrose Ave., Chicago 41, Ill.—C,L  
Schweber Electronics, 122 Herricks Rd., Mineola, L.I., N.Y.—D  
Screw Corp. of America, 103 Park Ave., New York 17, N.Y.—P  
Sealelectro Corp., 186 Union Ave., New Rochelle, N.Y.—P  
Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—P  
Selectar Industries, 401 E. 138 St., New York 54, N.Y.—B,C,D,J,L,M,N  
Sherman Mfg. Co., H. B., 22 Barney St., Battle Creek, Mich.—C,P  
Smith, Inc., Herman H., 436 18 St. Brooklyn 15, N.Y.—A,B,C,D,E,L,M,P  
Specialty Assembling, 79 Clifton Pl., Brooklyn 38, N.Y.—N,O,P  
Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—C  
Sperti Faraday, Inc., 1077 Celestial St., Cincinnati 2, Ohio—P  
Standard Electric Time Co., 119 Logan St., Springfield, Mass.—L,M,N  
Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—F,J,L,M  
Star Expansion Products Co., 147 Cedar St., New York 6, N.Y.—M  
States Co., 19 New Park Ave., Hartford, Conn.—P  
Staver Co., 41-51 N. Saxon Ave., Bay Shore, N.Y.—A,J,P  
Stone City, P. O. Box 351, Bedford, Ind.—P  
Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.—P  
Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.—I,P  
Switchcraft, Inc., 1328 N. Halsted St., Chicago, Ill.—F,G,M,N  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—B,C,D,F,G,H,I,L,M,N,O,P  
Technicraft Labs. Inc. Thomaston-Waterbury Rd., Thomaston, Conn.—J  
Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—O  
Tele-Matic Industries, Inc., 1 Joralemon St., Brooklyn 2, N.Y.—A,P  
Teletronic Labs., 1835 W. Rosecrans Ave., Gardena, Calif.—D  
Telex, 1633 Eustis St., St. Paul, Minn.—L,M  
Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—C,D,F,G,H,L,M,N,O,P  
Torwico Electronics, 967 Frelinghuysen Ave., Newark 5, N.J.—P  
Trim Inco, Libertyville, Ill.—F,G,N  
Titeflex, Inc., 500 Evinghuysen Ave., Newark 5, N.J.—B,C,M,O  
TV Development Corp., 2024 McDonald Ave., Brooklyn 23, N.Y.—B,C,D,G  
Ucinite Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.—A,B, C,D,F,K,M,P  
United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.—A,K,M,P  
U. S. Eng'g. Co., 521 Commercial St., Glendale 3, Calif.—P  
U.S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—B,C,D,E,F,G,H,J,P  
United Transformer Co., 150 Varick St., New York 13, N.Y.—B

Univex Corp., 102 Warren St., New York 7, N.Y.—B,C,D,P  
Vaco Products Co., 317 E. Ontario St., Chicago 11, Ill.—P  
Wade Electric Products Co., 211 Jacob, Sturgis, Mich.—C,O,P  
Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—P  
Walton Electronics Inc., 911 N. Larrabee St., Chicago 10, Ill.—A,E,P  
Welch Electric Co., 1221 Wade St., Cincinnati 14, Ohio—F,G  
Western Electronic Enterprises, 3348 W. Comp-ton Blvd., Gardena, Calif.—C,D  
Western Int'l. Co., 45 Vesey St., New York 7, N.Y.—B,C,D,F,G,H,I,L,M  
Western Mfg. Co., 1400 W. 22 St., Kearney, Neb.—D,H,J,M  
Weymouth Instrument Co., 1440 Commercial St., E. Weymouth 89, Mass.—D  
Whitaker Cable Corp., 1301 Burlington Ave., N. Kansas City 16, Mo.—C,P  
White Industries, 421 W. 54 St., New York 19, N.Y.—O  
Whitso, Inc., 9330 Byron St., Schiller Park, Ill.—F  
Willard Storage Battery Co., 1220 Huron Rd., Cleveland, Ohio—P  
Winchester Electronics Inc., 15 Crescent St., Gleason, Conn.—F,G,I,M,P  
Wood Co., A. M., 11938 E. Garvey Blvd., El Monte, Calif.—C,D,M,P  
Zierick Mfg. Corp., Beechwood & Rockdale Aves., New Rochelle, N.Y.—P

### 23—CONTROL EQUIPMENT, COMMUNICATIONS

Controls, broadcast input ..... A  
Controls, frequency ..... B  
Controls, illumination ..... C  
Controls, motor & generator ..... D  
Controls, photoelectric ..... E  
Controls, photographic ..... F  
Controls, power level ..... G  
Controls, remote radio ..... H  
Controls, tower lighting ..... I  
Controls, ventilation ..... K  
Tuners, automatic ..... J

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—D,E,F,H  
Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—A  
Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—B,E,F,K  
Aeronautical Radio Mfg. Co., 155 First St., Mineola, N.Y.—H  
Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—H  
ALTEC LANSING CORP., 9356 Santa Monica Blvd., Beverly Hills, Calif.—A  
American Electroengineering Corp., 2040 Colo. Ave., Santa Monica, Calif.—H  
ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—E,F  
A.R.F. Products, 7627 Lake St., River Forest, Ill.—H  
Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, N.Y.—B  
Atlas Metal Stamping Co., Castor & Kensington Aves., Philadelphia 24, Pa.—B,J  
Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—A  
Automatic Switch Co., 391 Lakeside Ave., Orange, N.J.—H  
Autotron Co., 128 W. Main St., Danville, Ill.—E,F,I  
Bar-Ray Products, 209 25 St., Brooklyn 32, N.Y.—F  
Bassett, Inc., Rex, 1314 N.E. 17 Court, Fort Lauderdale, Fla.—H  
Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif.—H  
BERKELEY SCIENTIFIC DIV. BECKMAN INSTRUMENTS INC., 220 Wright Ave., Richmond, Calif.—B,D,E,F  
BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—B  
Bolsley Corp. of America, 118 E. 25 St., New York 10, N.Y.—E,F  
Bristol Co., The, Waterbury 20, Conn.—G  
Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,B,C,E,G,H  
Bulova Watch Co., 630 5 Ave., New York, N.Y.—B  
Central Scientific Co., 1700 W. Irving Park Rd., Chicago, Ill.—B  
C.G.S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—H,J  
CINEMA ENG'G. CO., Div Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—A  
Clark Controller Co., 1146 E. 152 St., Cleveland 10, Ohio—D  
Clary Multiplier Corp., 403 Junipero St., San Gabriel, Calif.—G  
Codetypelabs., 550 Fifth Ave., New York 19, N.Y.—H  
Communications Co., 300 Greco Ave., Coral Gables, Fla.—H  
Croname, Inc., 3701 Ravenswood Ave., Chicago 13, Ill.—J  
Cutler-Hammer, Inc., 436 N. 12 St., Milwaukee 1, Wisc.—B,D,E,K  
Daven Co., 191 Central Ave., Newark 4, N.J.—A,B,G

Deitz Co., S. J., 38 River Edge Rd., River Edge, N.J.—E  
 Delco Radio Div., General Motors Corp., Kokomo, Ind.—J  
 Denrad Mfg. Co., 310 W. Woodard St., Denison, Tex.—A,E,H  
 De-Tec-Tronic Labs. Inc., 1711 Terra Cotta Pl., Chicago 14, Ill.—E  
 Diatren Co., 3327 Dixie Dr., Houston, Tex.—B  
 Dorn Equip. Corp., 88 Broad St., Boston 10, Mass.  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—A,B  
 DUMONT LABS. INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—F  
 Eagle Signal Corp., 202 20 St. Moline, Ill.—D  
 Edgerton, Germeshausen & Grier, Inc., 160 Brookline Ave., Boston 15, Mass.—E,F  
 Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.—B  
 Electric Eye Equip. Co., 6 W. Fairchild St., Danville, Ill.—E  
 Electrodyne Co., Norwood, Mass.—E  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—E  
 Electronic Research, 11550 39 St., N.E., Seattle 55, Wash.—E,H  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—E  
 Electro-Physics Co., 287 Broadway, New York 7, N.Y.—E,F  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—D,E  
 Electrotech Corp., 15601 Arrow Hwy., Azusa, Calif.—H  
 Electro Vision Lab., 4227 Francis Lewis Blvd. Bayside 61, N.Y.—E,F  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—H  
 El-Tronics, Inc., 5th & Noble Sts., Philadelphia 23, Pa.—E  
 Eng'g. Research & Devel. Co., Addison, Ill.—E  
 Eng'g. Research Associates, Div. Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—J  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—A,E  
 Ernst Norrman Labs., Williams Bay, Wis.—B  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,H,J  
 FAIRCHILD CAMERA & INSTRUMENT Corp., Robbins Lane, Syosset, N.Y.—E,F  
 Filters, Inc., 30 Sagamore Hill Dr., Port Washington, N.Y.—B,D  
 Franklin Control Corp., 1975 S. Allis St., Milwaukee 7, Wisc.—D  
 Gables Eng'g. Inc., 247 Greco Ave., Coral Gables, Fla.—H



Gardner Lab. Inc., Henry A., 4723 Elm St., Bethesda 14, Md.—E  
 GATES RADIO CO., Quincy, Ill.—H  
 Gavco Corp., 540 E. 80 St., New York, N.Y.—F  
 General Communications, Box 169, Fort Atkinson, Wisc.—A  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B,D,E,G,J,K  
 Haledy Electronics Co., 57 William St., New York 5, N.Y.—B,E  
 HAMMARLUND MFG. CO., 460 W. 34 St., New York 1, N.Y.—H  
 Hansen Co., Wm., 165 Silverbrook Ave., Niles, Mich.—E  
 Hanson-Gorill-Brian, Inc., 1 Continental Hill, Glenn Cove, N.Y.—E  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—H  
 Hastings Instrument Co., Hampton, Va.—G,H  
 Hughey & Phillips, P. O. Box 686, Encino, Calif.—E,H,I  
 Induction Motors Corp., 55-15 37 Ave., Woodside 77, N.Y.—D  
 Industrial Electronics Co., Hanover St., Hanover Mass.—E  
 Inet, 8655 S. Main, Los Angeles, Calif.—G  
 Instrument Devel. Labs. Inc., 163 Highland Ave., Needham Heights 94, Mass.—E  
 Int'l. Electronics Corp., 147 Parkhouse St., Dallas 2, Texas—A  
 iq industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—E  
 Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass.—F  
 Joy Mfg., Oliver Bldg., Pittsburgh 22, Pa.—K  
 Lavoie Labs. Inc., Morganville, N.J.—J  
 Lear Inc., 1196 W. Pico Blvd., Los Angeles 64, Calif.—J  
 Logistics Research 141 S. Pacific Ave., Redondo Beach, Calif.—E  
 Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill.—E,H  
 Lynch Carrier Systems, Inc., 96 Jessie St., San Francisco 5, Calif.—H

Lysco Mfg., 1401 Clinton St., Hoboken, N.J.  
 Machine O'Mat Co., Inc., 1631 S. Michigan Ave., Chicago, Ill.—E  
 McLean Eng'g. Labs., 260 Nassau St., Princeton, N.J.—K  
 MacKenzie Products Co., 141 Brewery St., New Haven, Conn.—B  
 Mag-Electric Products Inc., 14405 Crenshaw Ave., Gardiner, Calif.—D  
 Magnetic Amplifiers Inc., 632 Tinton Ave., New York 55, N.Y.—D,E,G  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—E,H  
 Master Appliance Mfg. Co., 4 & Ontario Sts., Racine, Wis.—D  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—H  
 Metrotype Corp., 525 W. 76 St., Chicago 20, Ill. B,D  
 Micro Balancing, Inc., 191 Herrick Rd., Garden City Park, N.Y.—C,I  
 Modelectric Products Corp., Asbury Park, N.J.—D  
 Montgomery Mfg. Co., Owensville, Ind.—A  
 Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill.—H  
 Muckle Mfg. Co., Owatonna Minn.—K  
 Multi-Trop Lab., 4624 Washington Blvd., Chicago 44, Ill.—E  
 National Instrument Co., 23 E. 26 St., New York 10, N.Y.—J  
 North American Model Products, 9802 Warwick Rd., Warwick, Va.—H  
 Northeastern Eng'g. Corp., So. Bedford St., Manchester, N.H.—H  
 Oberline Ltd., 6411 Hollywood Blvd., Hollywood 28, Calif.—A  
 O'Brien Electric Corp., 6514 Santa Monica Blvd., Hollywood 38, Calif.—A,E  
 Ohmite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill.—D  
 Petroff, Peter A., 127 Water St., New York 5, N.Y.—H  
 Philamon Labs. Inc., 5717 3 Ave., Brooklyn 20, N.Y.—B  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—C,E  
 Photobell Co., 116 Nassau St., New York 38, N.Y.—E,I  
 Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—E,F,J  
 Pioneer Patents & Products Co., 3720 N. New England Ave., Chicago 34, Ill.—D  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—B,E  
 Radar-Electronics Inc., 229 W. 28 St., New York 1, N.Y.—B,E  
 Radio Corp. of America, RCA Victor Div. Front & Cooper St., Camden 2, N.J.—A  
 RAYTHEON MFG. CO., Waltham 54, Mass.—D  
 Regulator Eng'g. & Devel. Co., 11545 W. Jefferson Blvd., Culver City, Calif.—B  
 Rich Electronics Inc., 212 N. W. 8 Ave., Miami 36, Fla.—H  
 Riverbank Labs., Batavia Ave.—P. O. Box 65, Geneva, Ill.—B  
 Robinette Co., W. C., 802 Fair Oaks Ave., S. Pasadena, Calif.—B  
 Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—C,E,F  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—E  
 Ryan Industries, 19159 John R. St., Detroit 3, Mich.—H  
 Scott Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—A  
 Servo-Tek Products Co., 1086 Goffe Rd., Hawthorne, N.J.—D  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—A  
 Spar Eng'g. & Devel. Inc., South & Paxson Ave., Wyncote, Pa.—H  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—F  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A  
 Tech Labs., 120 Hillcrest Ave., Leonia, N.J.—A  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—H  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—H  
 Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—E  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—B,D,E,F,H  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—J  
 United Electric Controls Co., 85 School St., Watertown 75, Mass.—D  
 Univex Corp., 102 Warren St., New York 7, N.Y.—E  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—E,F  
 Vickers Electric Div., Vickers, Inc., 1835 Locust St., St. Louis 3, Mo.—D  
 Welch Electric Co., 1221 Wade St., Cincinnati 14, Ohio—E  
 Weltronic Co., 19500 W. 8 Mile Rd., Detroit 19, Mich.—D  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—H  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—E  
 Westrex Corp., 111 8 Ave., New York 11, N.Y.—H  
 Wickes Eng'g. & Construction Co., 12 & Ferry Ave., Camden 4, N.J.—H  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—A,B  
 Worner Electronic Devices, Rankin, Ill.—C,E,I,K

### Voltage-Power-DB Ratios

-db		db	+db	
Voltage Ratio	Power Ratio	db	Voltage Ratio	Power Ratio
1.0000	1.0000	0	1.000	1.000
.9772	.9550	.2	1.023	1.047
.9550	.9120	.4	1.047	1.096
.9333	.8710	.6	1.072	1.148
.9120	.8318	.8	1.096	1.202
.8913	.7943	1.0	1.122	1.259
.7943	.6310	2.0	1.259	1.585
.7079	.5012	3.0	1.413	1.995
.6310	.3981	4.0	1.585	2.512
.5623	.3162	5.0	1.778	3.162
.5012	.2512	6.0	1.995	3.981
.4467	.1995	7.0	2.239	5.012
.3981	.1585	8.0	2.512	6.310
.3548	.1259	9.0	2.818	7.943
.3162	.1000	10.0	3.162	10.000
.2512	.06310	12.0	3.981	15.85
.1995	.03981	14.0	5.012	25.12
.1585	.02512	16.0	6.310	39.81
.1259	.01585	18.0	7.943	63.10
10 <sup>-1</sup>	10 <sup>-2</sup>	20.0	10	10 <sup>2</sup>
3.162 x 10 <sup>-2</sup>	10 <sup>-3</sup>	30.0	3.162 x 10	10 <sup>3</sup>
10 <sup>-2</sup>	10 <sup>-4</sup>	40.0	10 <sup>2</sup>	10 <sup>4</sup>
3.162 x 10 <sup>-3</sup>	10 <sup>-5</sup>	50.0	3.162 x 10 <sup>2</sup>	10 <sup>5</sup>
10 <sup>-3</sup>	10 <sup>-6</sup>	60.0	10 <sup>3</sup>	10 <sup>6</sup>
3.162 x 10 <sup>-4</sup>	10 <sup>-7</sup>	70.0	3.162 x 10 <sup>3</sup>	10 <sup>7</sup>
10 <sup>-4</sup>	10 <sup>-8</sup>	80.0	10 <sup>4</sup>	10 <sup>8</sup>
3.162 x 10 <sup>-5</sup>	10 <sup>-9</sup>	90.0	3.162 x 10 <sup>4</sup>	10 <sup>9</sup>
10 <sup>-5</sup>	10 <sup>-10</sup>	100.0	10 <sup>5</sup>	10 <sup>10</sup>

Stratford Pen Corp., 44 W. 28 St., New York, N.Y.  
 Streeter-Amet Co., 4101 Ravenswood Ave., Chicago 13, Ill.—J,AB,AC,AE,AG,AI,AO,AQ  
 Struthers, Dunn Inc., 150 N. 13 St., Philadelphia 7, Pa.—AW,AAA,AAB  
 Superior Electric Co., 83 Laurel St., Bristol, Conn.—AT  
 Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—D  
 Swarouth Co., 18511 Euclid Ave., Cleveland 12, Ohio—J,K,Q,S,AB,AH  
 Synchronic Productions, 766 Broadway, Bayonne, N.J.—W  
 Taco West Corp., 525 N. Noble St., Chicago 22, Ill.—MAH  
 Tech Labs. Inc., 120 Hillcrest Ave., Leonia, N.J.—G,U  
 TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—AW  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—F,I,Q,S,AF  
 Teleregister Corp., 157 Chambers St., New York 7, N.Y.—AQ  
 Teletronics Lab., 54 Kinkel St., Westbury, L.I., N.Y.—P  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—AV,AAB  
 Thermo Instrument Co., P. O. Box 336, Belmont, Calif.—N,Q,AH  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,B,T,V,X,Y,AC,AD,AO,AQ,AS,AT,AU,AV,AW,AX,AZ,AAA,AAB  
 Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland 3, Ohio—AW  
 Timetrol Co., 2919 Gladstone Ave., Rockford, Ill.—AP,AW,AX,AAA  
 Todd-Tran Corp., 156 Gramatan Ave., Mt. Vernon, N. Y.—C  
 Tork Clock Co., 1 Grove St., Mt. Vernon, N.Y.—AW,AAA  
 Torsion Balance Co., Monhegan St., Clifton, N.J.—E,P,AO  
 Tracerlab, Inc., 130 High St., Boston 10, Mass.—I,Q,S,AX  
 Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—AE,AT  
 Trans-Sonics Inc., Bedford Airport, Bedford, Mass.—AB,AE,AH,AG  
 Ulanet Co., George, 413 Market St., Newark 5, N.J.—AH,AAB

Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—D,W,AE,AL,AS,AT,AV,AAA  
 Ultrasonic Eng'g. Co., P. O. Box 46, Maywood, Ill.—AL  
 United Electric Controls, 85 School, Watertown 75, Mass.—A,M,Q,V,W,AB,AH,AM  
 U. S. Testing Co., 1415 Park Ave., Hoboken, N.J.—P  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—AT  
 Univex Corp., 102 Warren St., New York 7, N.Y.—X  
 Vacuum-Electronic Eng'g. Co., 86 Denton Ave., New Hyde Park, L.I., N.Y.—AM,AU  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—AM,AAA  
 Valverde Labs., 252 Lafayette St., New York 12, N.Y.—AH  
 Varo Mfg., 1801 Walnut, Garland, Tex.—AT  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—X,Y,Z,AE,AQ,AR,AAA  
 Veeder-Root Inc., 70 Sargeant St., Hartford 2, Conn.—A,Q,V  
 Vickers Electric Co., Vickers, Inc., 1835 Locust St., St. Louis 3, Mo.—V  
 Vocaline Co. of America Inc., Coulter St., Saybrook, Conn.—AV,AW,AX,AZ,AAA  
 Wakmann Watch Co., 15 W. 47 St., New York 36, N.Y.—AV,AW,AY,AAA  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—AQ,AV,AAA  
 Wang Laboratories, 296 Columbus Ave., Boston 16, Mass.—AQ  
 Weksler Thermometer Corp., 49 W. 32 St., New York 1, N.Y.—AB,AH,AM  
 Welch Electric Co., 1221 Wade St., Cincinnati, Ohio—D,G,AZ  
 Weltronic Co., 19500 W. 8 Mile Rd., Detroit 19, Mich.—V,AP,AS,AT,AV,AAA  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—B  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—A,H,N,O,X  
 Worner Electronic Devices, Rankin, Ill.—B,C,E,O,X,AF,AN,AZ  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio—Z,AB,AE  
 Wood Counter Lab., N., 5491 Blackstone Ave., Chicago 15, Ill.—AQ  
 Yellow Springs Instrument Co., P. O. Box 106, Yellow Springs, Ohio—AV,AW,AX

MacKenzie Products Co., 141 Brewery St., New Haven, Conn.—H,I  
 Mandex Mfg. Co., 2608 W. 16th St., Chicago 8, Ill.—H  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—B  
 Methode Mfg. Corp., 2021 W. Churchill St., Chicago 47, Ill.—G  
 MIDLAND MFG. CO., 3155 Fiberglass Rd., Kansas City 15, Mo.—B  
 Miller Labs., A.E., 9226 Hudson Blvd., N. Bergen, N.J.—B,D,F,H  
 Monitor Products Co., 815 Fremont Ave., S. Pasadena, Calif.—B,H  
 Moseley Electronics, Inc., 8622 St. Charles Rock Rd., St. Louis 14, Mo.—G  
 National Electronic Mfg. Corp., 42-08 Vernon Blvd., L.I.C. 1, N.Y.—H  
 Nebel Lab., R. E., 1104 Lincoln Pl., Brooklyn 13, N.Y.—B,H  
 Pan American Trade Devel. Corp., 2 Park Ave., New York 16, N.Y.—B  
 Polytech Devices, Inc., 1180 E. Grand St., Elizabeth, N.J.—B,D,F,H  
 Precise Devel. Corp., 999 Long Beach Rd., Oceanside, L.I., N.Y.—I  
 Precision Piezo Service, 427 Mayflower St., Baton Rouge, La.—B  
 Radio Frequency Labs., Boonton, N.J.  
 Radio Specialty Mfg. Co., 2023 S.E. 6th Ave., Portland 14, Ore.—B  
 RAYPAR INC., 7300 W. Addison St., Chicago 34, Ill.—I  
 REEVES-HOFFMAN CORP., 145 Cherry St., Carlisle, Pa.—B,D  
 Remeler Co., 2101 Bryant St., San Francisco 10, Calif.—H  
 Schutter Mfg. Co., Carl W., 80 E. Montauk Highway, Lindenhurst, N.Y.—H,I  
 Scientific Radio Products Inc., 215 S. 11 St., Omaha 8, Nebr.—B  
 Scientific Radio, 4301 Sheridan St., Hyattsville, Md.—B  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—E  
 SHURE BROS., 225 W. Huron St., Chicago 10, Ill.—E  
 Standard Crystal Co., 1714 Locust St., Kansas City, Mo.—B  
 STANDARD PIEZO CO., Carlisle, Pa.—B  
 Tallon Co., 159 Carlton Ave., Brooklyn 5, N.Y.—B,C  
 Valpey Crystal Corp., 1274 Highland St., Holliston, Mass.—B,D,H  
 Webster Electric Co., 1900 Clark St., Racine, Wisc.—E  
 Wright Electronic Devel. Co., 1519 McGee St., Kansas City 8, Mo.—B

## 25—CRYSTALS & ACCESSORIES

### CRYSTALS

Crystals, barium titanate ..... A  
 Crystals, quartz ..... B  
 Crystals, rochelle salt ..... C  
 Crystals, tourmaline ..... D

### CRYSTAL ACCESSORIES

Crystal cartridges ..... E  
 Crystal electrodes ..... F  
 Crystal sockets ..... G  
 Holders ..... H  
 Probes ..... I

Aeronautical Electronics, Inc., Raleigh-Durham Airport, Raleigh, N.C.—B  
 Aeronautical Radio Mfg. Co., 155 1st St., Mineola, N.Y.—B,G,H  
 Alden Products Co., 117 N. Main St., Brockton 64, Mass.—G,H  
 American Lava Corp., Chattanooga 5, Tenn.—A,H  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—G  
 American Radio Hardware Co., 152 MacQuesten Parkway S., Mt. Vernon, N.Y.—I  
 Anderson Labs., 39 Talcott Rd., W. Hartford 10, Conn.—I  
 Astatic Corp., 250 Harbor St., Conneaut, Ohio—E  
 Bassett, Rex Inc., 1314 N.E. 17 Court, Ft. Lauderdale, Fla.—B  
 Bendix Aviation Corp., 11600 Sherman Way, N. Hollywood, Calif.—A  
 BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa.—B  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—I  
 BOMAC LABS., INC., Salem Rd., Mass.—J,K  
 Bram Chemical Co., 820 65 Ave., Philadelphia 26, Pa.—A,B,D  
 Branson Instruments, Inc., 430 Fairfield Ave., Stamford, Conn.—B  
 Breon Labs., 1520 Evergreen Rd., Williamsport, Pa.—B,F,H  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—E  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—A,B,C,F  
 Burwood Corp., 4921 Exposition Blvd., Los Angeles, Calif.—B  
 CENTRALAB, DIV. OF GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wisc.—A,G,H  
 CINCH MFG. CO., 1026 S. Homan Ave., Chicago 24, Ill.—G  
 Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—B

Coil Winders, Inc., New York Ave., Westbury, L.I.—H  
 Communication Devices Co., 2331 12 Ave., New York City 27, N.Y.—B  
 Computer Research Corp., 3348 W. El Segundo Blvd., Hawthorne, Calif.—G  
 CONSTANTIN & CO., L.L., Rt. 46, Lodi, N.J.—F,G  
 Continental Electronics Ltd., 302 Oakland St., Brooklyn 22, N.Y.—H  
 Cryco Inc., 1138 Mission St., S. Pasadena, Calif.—B,H  
 Dallons Labs., 5066 Santa Monica Blvd., Los Angeles 29, Calif.—B  
 DeMornay-Bonardi, Inc., 3223 Burton Ave., Burbank, Calif.—H  
 Diamond Drill Carbon Co., 53 Park Row, New York 38, N.Y.—B  
 Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—H  
 DX RADIO PRODUCTS INC., 2300 W. Armitage Ave., Chicago 47, Ill.—B  
 EBY INC., HUGH H., 4700 Stenton Ave., Philadelphia 44, Pa.—G  
 Eidson Electronic Co., 1902 N. 3rd St., Temple, Tex.—B  
 Elco Corp., 190 W. Glenwood Ave., Philadelphia 40, Pa.—G  
 Electronic Assemblies Co., 122 W. 5th St., Kansas City 5, Mo.—F,H  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—E,F  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—H,I  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,B,D  
 Erie Resistor Corp., 644 W. 12 St., Erie, Pa.—A  
 F & M Sales, Inc., 1054 Cahuenga Blvd., Hollywood 38, Calif.—F  
 Gasket Eng'g. Co., 2444 Charlotte St., Kansas City 8, Mo.—F  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—B  
 GULTON MFG CO., 212 Durham Ave., Metuchen, N.J.—A,B,C,I  
 Hansell, Inc., U. 50 Liberty St., Westerly, R.I.—A  
 HERMETIC SEAL PRODUCTS CO., 33 S. 6th St., Newark 7, N.J.—H  
 Hudson American Corp., 25 W. 43 St., New York, N.Y.—B  
 Hunt Corp., 453 Lincoln St., Carlisle, Pa.—B  
 Isolantite Mfg. Corp., Warren Ave., Stirling, N.J.—H  
 JOHNSON CO., E. F., WASECA, MINN.—G  
 Kemtron Electron Products 23 Brown St., Salem, Mass.—J,K,L  
 Keystone Electronics Co., 114 Manhattan Ave., Stamford, Conn.—B  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—G,I  
 Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—I  
 KNIGHTS CO., JAMES, Sandwich, Ill.—B,H

## 26—DETECTORS

Detectors, crystal ..... A  
 Detectors, fire ..... B  
 Detectors, flaw ..... C  
 Detectors, gas ..... D  
 Detectors, impedance ..... E  
 Detectors, leak ..... F  
 Detectors, lie ..... O  
 Detectors, metal ..... G  
 Detectors, null ..... H  
 Detectors, radiation ..... I  
 Detectors, resistance ..... J  
 Detectors, smoke ..... K  
 Detectors, standing wave ..... L  
 Detectors, vibration ..... M  
 Detectors, water leak ..... N

Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—C,D,G,H,M  
 Aerolux Light Corp., 653 11 Ave., New York 36, N.Y.—I  
 Alco Mfg. Co., 4011 Cuming St., Omaha 3, Nebr.—I  
 Amperex Electronic Corp., 230 Duff Ave., Hicksville, Long Island, N.Y.—I  
 Andrew Corp., 363 E. 75 St., Chicago 19, Ill.—L  
 Anton Electronic Labs., 1226T Flushing Ave., Brooklyn 37, N.Y.—I  
 Arenberg Ultrasonic Lab., 94 Green St., Jamaica Plain 30, Mass.—C,G  
 Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, N.Y.—E  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—I  
 Atomlab Inc., 489 5 Ave., New York 17, N.Y.—I  
 Babaco Alarm Systems, Inc., 723 Washington St., New York 14, N.Y.—M  
 Barker & Williamson Inc., 237 Fairfield Ave., Upper Darby, Pa.—H  
 Barton Electronics, Inc., 955 Asylum Ave., Hartford 5, Conn.—C,K  
 Berkshire Laboratories, 586 Beaver Pond Rd., Lincoln, Mass.—A,H  
 Bogart Mfg. Corp., 315 Seigel St., Brooklyn 6, N.Y.—A,E,L  
 Brillmayer Labs. Inc., E.W., 86 Fulton St., New York 7, N.Y.—G  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—D,H,I,L  
 Brown Electro-Measurement Corp., 4635 S.E. Hawthorne Blvd., Portland 15, Ore.—H

BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—L,M  
 Century Geophysical Co., 3406 W. Washington Blvd., Los Angeles 18, Calif.—C,G  
 Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—I  
 Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—I  
 Combustion Control Corp., 720 Beacon St., Boston 15, Mass.—B  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—F,I,M  
 Consolidated Vacuum Corp., 735 Ridge Rd. W., Rochester 3, N.Y.—F  
 Dage Electronics Corp., 69 N. 2 St., Beech Grove, Ind.—B,K  
 DeMornay-Bonardi, Inc., 3223 Burton Ave., Burbank, Calif.—L  
 Detect-O-Ray Co., 2622 N. Halsted St., Chicago 14, Ill.—K  
 Detection Co., 5631 Cahuenga Blvd., N. Hollywood, Calif.—G,I,N  
 Diatron Co., 3327 Dixie Dr., Houston 21, Texas—C,G  
 Dice Co., J.W., 1 Engle St., Englewood, N.J.—C,G  
 Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—H  
 Dorne & Margolin, 30 Sylvester St., Westbury, N.Y.—L  
 Edison, Inc., Thomas A., 93 Lakeside Ave., W. Orange, N.J.—B  
 Electro-Mechanical Research, 64 Main St., Ridgefield, Conn.—G  
 Electro-Medical Lab., 1 Hoof-print Trail, South Woodstock, Vt.—O  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—C,K  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—B,K  
 EL-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—B,I  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A  
 Erwood, Inc., 1770 W. Berteau Ave., Chicago 13, Ill.—F,M  
 Ess Instrument Co., 96 S. Washington Ave., Bergenfield, N.J.—K  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,B  
 Fenwal Inc., Pleasant St., Ashland, Mass.—B  
 Fisher Research Lab., Inc., 1961 University Ave., Palo Alto, Calif.—F,G,N  
 Flett Lab., 3711 Marshall Rd., Drexel Hill, Pa.—B,I  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—H  
 GATES & CO., GEO. W., Hempstead Turnpike & Lucille Ave., Franklin Square, Long Island, New York—F,N  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—C,F,K,M  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—A  
 GENERAL PRECISION LAB., INC., 63 Bedford Rd., Pleasantville, N.Y.—L  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—H,I,M  
 Georator Corp., Manassas, Va.—I  
 Glens Falls Lab., Inc., 284 Glen St., Glens Falls, N.Y.—I  
 Gow-Mac Instrument Co., 22 Lawrence St., Newark 5, N.Y.—D  
 GULTON MFG. CO., 212 Durham Ave., Metuchen, N.J.—A,C,G,M  
 G.W. Associates, P. O. Box 2263, El Segundo, Calif.—L  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—H,L  
 Impact-O-Graph Corp., 1900 Euclid Bldg., Cleveland 15, Ohio—M  
 Industrial Test Equip. Co., 55 E. 11 St., New York 3, N.Y.—H  
 Industrial Transformer Corp., Gouldsboro, Pa.—H  
 Instrument Devel. Labs., Inc., 163 Highland Ave., Needham Heights 94, Mass.—D  
 Int'l. Research & Devel. Corp., 1027 W. 5 Ave., Columbus 8, Ohio—M  
 iq Industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—B,C,F,G,H,J,K  
 Jerrold Electronics Corp., 26 & Dickinson Sts., Philadelphia 46, Pa.—A  
 Johnson-Williams, Ltd., Box 6, Station A., Palo Alto, Calif.—D  
 Kemtron Electron Products, 23 Brown St., Salem, Mass.—A  
 Land-Air, Inc., 440 W. Superior St., Chicago 10, Ill.—B  
 Liston-Becker Instrument Co., 649 Hope St., Springdale, Conn.—D  
 Litton Engineering Labs., 1049 Brittan Ave., San Carlos, Calif.—L  
 Lord-Taber Co., 40 Ontario St., Canandaigua, N.Y.—B  
 Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill.—C,K,N  
 McNeill Eng'g. Co., 4057 W. Van Buren St., Chicago 24, Ill.—K  
 MacDonald Co., W.S., 33 University Rd., Cambridge 38, Mass.—H  
 Mackay Inc., A.D., 198 Broadway, New York 38, N.Y.—A  
 Magnaflex Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.—C,F,G,N  
 Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y.—F,K  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—I  
 MAICO CO., 21 N. 3 St., Minneapolis, Minn.—O



Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—E,I  
 Massa Labs., Inc., 5 Flottler Rd., Hingham, Mass.—M  
 Master Appliances, Inc., 1600 Factory Ave., Marion, Ohio—F  
 MB Mfg. Co., 1060 State St., New Haven 11, Conn.—M  
 Menlo Research Lab., P. O. Box 522, Menlo Park, Calif.—C,F,I,N  
 Microtran Co., Div., Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach 93, N.Y.—G,H,M  
 MICROWAVE ASSOCIATES, 22 Cummington St., Boston 15, Mass.—A  
 Microwave Devel. Labs., 220 Grove St., Waltham, Mass.—A,L  
 MIDLAND MFG. CO., 3155 Fiberglass Rd., Kansas City 15, Mo.—A  
 MILLIVAC INSTRUMENT CORP., 444 2 St., Schenectady, N.Y.—H  
 Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.—D  
 Minn.-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.—H  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—F,G,I,K  
 National Research Corp., Equip. Div., 70 Memorial Dr., Cambridge 42, Mass.—F  
 New London Instrument Co., P. O. Box 189, New London, Conn.—I  
 N. R. K. MFG. & ENG'G. CO., 4601 W. Addison St., Chicago 41, Ill.—A,L  
 Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.—I  
 Nuclear Measurements, 2460 N. Arlington Ave., Indianapolis 18, Ind.—I  
 Nuclear Research Corp., 2563 Grays Ferry Ave., Philadelphia 46, Pa.—C,G,I  
 Nuclear Research & Devel. Co., 6425 Etzel Ave., St. Louis 14, Mo.—A,C,G,I  
 Nucleonic Co. of America, 497 Union St., Brooklyn 31, N.Y.—I  
 Ohmart Corp., 2347 Ferguson Rd., Cincinnati 38, Ohio—H,I  
 Peschel Electronics, Inc., 13 Garden St., New Rochelle, N.Y.—F  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—A  
 Phoenix Precision Instrument Co., 3803 N. Fifth St., Philadelphia 40, Pa.—B,K  
 Photobell Co., 116 Nassau St., New York 38, N.Y.—C,F,K,N  
 Photocon Research Products, 421 N. Foothill Blvd., Pasadena 8, Calif.—C,G  
 Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—K  
 POLYTECHNIC RESEARCH & DEVEL., 55 Johnson St., Brooklyn 1, N.Y.—A,E,L  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—I  
 Precision Radiation Instruments, 2235 S. LaBrea, Los Angeles 16, Calif.—I  
 Press Wireless Mfg. Co., 155 W. Main St., Rickville, Conn.—L  
 Radiation Counter Labs., 5122 W. Grove St., Skokie, Ill.—I  
 Radioactive Products, 443 W. Congress, Detroit 26, Mich.—I  
 RADIO RECEPTOR CO., 84 N. 9 St., Brooklyn 11, N.Y.—A  
 RAYTHEON MFG. CO., Waltham, Mass.—D  
 Raytheon TV & Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill.—I  
 R-C Scientific Instrument, 307 Culver Blvd., Playadale, Calif.—I  
 Research Electronics Labs., Roslyn, Pa.—D,F  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—B,C,G,I,M  
 Ripley Co., 1 Factory St., Middletown, Conn.—K,L  
 Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—M  
 Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—H,M  
 Servo Corp. of America, 2020 Jericho Turnpike, New Hyde Park, L.I., N.Y.—I  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Colingdale, Pa.—E,H,J  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—L  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Tex.—M  
 Sperry Products Inc., Shelter Rock Rd., Danbury, Conn.—C,G  
 Standard Electronic Research Corp., 2 East End Ave., New York 21, N.Y.—C,G,I  
 Technical Operations, Inc., 6 Schouler Court, Arlington 74, Mass.—C,G,I  
 Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—H,I  
 Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—L  
 Tracerlab, Inc., 130 High St., Boston 10, Mass.—F,I  
 Transistor Products Inc., 55 Union St., Brighton 35, Mass.—A  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—C,G

Universal Mfg. Co., 410 Hillside Ave., Hillside, N.J.—A,L  
 Univex Corp., 102 Warren St., New York 7, N.Y.—I  
 Vacuum-Electronic Eng'g. Co., 86 Denton Ave., New Hyde Park, L.I., N.Y.—F  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—H,L  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—I,M  
 Victory Eng'g. Corp., Springfield Rd., Union, N.J.—D  
 Waveline, Inc., Passaic Ave., Caldwell, N.J.—L  
 Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—I  
 Weston Labs., Inc., Oak Hill Rd., Harvard, Mass.—L  
 Whittington Pump & Engineering Corp., 1126 Prospect St., Indianapolis 3, Ind.—F  
 Wood Counter Lab., N., 5491 Blackstone Ave., Chicago 15, Ill.—I  
 Worner Electronic Devices, Rankin, Ill.—C,K

## 27—DIALS & FRONT PANEL ACCESSORIES

Belts .....	A
Chains .....	B
Crystals .....	C
Decalcomanias .....	D
Dials, complete .....	E
Dials, telephone .....	F
Drives, worm .....	G
Escutcheons .....	H
Faceplates .....	I
Faces .....	J
Knobs, metal .....	K
Knobs, molded .....	L
Knobs, wood .....	M
Lights, dial .....	N
Lights, dial assembly .....	O
Lights, jewel pilot .....	P
Lights, panel .....	Q
Locks, dial .....	R
Locks, shaft .....	S
Nameplates .....	T
Pointers, dial .....	U
Rubbers, drive .....	V
Scales .....	W
Springs, knob .....	X
Tabs .....	Y

Ackerman Engravers, 75 Warren St., New York 7, N.Y.—I  
 Acromark Co., 9 Morrell St., Elizabeth 4, N.J.—E,T,W  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—N,O,P,Q  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass.—K,L,N,O,P,Q  
 Alina Corp., 401 Broadway, New York 13, N.Y.—U  
 Allied Allegri Machine Co., 141 River Rd., Nutley 10, N.J.—E  
 Allied Engraving & Stamping Co., 161 Ellicott St., Buffalo 3, N.Y.—E,T  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—E  
 American Laubscher Corp., 333 W. 52 St., New York 19, N.Y.—E,T,U,W  
 American Radio Hdwe. Co., 152 MacQuisten Pkwy. S., Mt. Vernon, N.Y.—K,L,M,N,O,P,Q  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—H  
 American Wood Working Co., 1682 N. Lowell Ave., Chicago 39, Ill.—M,T  
 Augat Bros. Inc., 33 Perry Ave., Attleboro, Mass.—R  
 Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—F  
 AVERY ADHESIVE LABEL CORP., 1616 S. Calif. Ave., Monrovia, Calif.—D,T,Y  
 Belock Instrument Co., College Point, N.Y.—E  
 Birnbach Radio Co., 145 Hudson St., New York 13, N.Y.—U  
 Bodnar Industries, 19 Railroad Ave., New Rochelle, N.Y.—I  
 BORG EQUIP. DIV., GEORGE W. BORG CORP., 120 S. Main St., Janesville, Wis.—E,U  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—E,J,K,T  
 Brady Co., W. H., 727 W. Glendale Ave., Milwaukee 12, Wis.—D,T,Y  
 Brillhart Plastic Corp., Box 31, Old Country Rd., Mineola, L.I., N.Y.—L,N,Q  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—D,H,L,X  
 BUD RADIO INC., 2118 E. 55 St., Cleveland 3, Ohio—S  
 CINCH MFG. CO., 1026 S. Homan Ave., Chicago 24, Ill.—X  
 Citation Products Co., 233 E. 146 St., New York 51, N.Y.—R,S  
 Colorvision Plastics, 247 Atlantic Ave., Boston 10, Mass.—E,I,J,T  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—F  
 Corning Glass Works, P. O. Box 544, Corning, N.Y.—T,W



Croname, Inc., 3701 Ravenswood Ave., Chicago 13, Ill.—E,H,R,T,W  
 Daven Co., 191 Central, Newark 4, N.J.—L  
 Delco Radio Div., General Motors Corp., Kokomo, Ind.—K  
 DIALIGHT CORP., 60 Stewart Ave., Brooklyn 37, N.Y.—N,O,P,Q  
 Dietz Co., H. G., 12-16 Astoria Blvd., Long Island City 2, N.Y.—T  
 Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio—L  
 Dorn Equip. Corp., 88 Broad St., Boston 10, Mass.—P,Q  
 Drake Mtg. Co., 1713 W. Hubbard St., Chicago 22, Ill.—N,O,P,Q  
 DuMONT LABS. INC., ALLEN B., Instrument Div., 760 Bloomfield Ave., Clifton, N.J.—L,W  
 Duramark, Inc., 2 Secatong Ave., Port Washington, N.Y.—Y  
 EBY INC., H. H., 4700 Stenton Ave., Philadelphia 44, Pa.—L  
 Electromatic Mfg. Corp., 88 University Pl., New York 3, N.Y.—K,L  
 Electronic Assemblies Co., 122 W. 5 St., Kansas City 5, Mo.—K,T  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—N,O,P,Q  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—T  
 Emeloid Co., 1239 Central Ave., Hillside, N.J.—E,F,H,L,O,T,U,W  
 ERCA Tool Die & Stamping Co., 19 Ash St., Brooklyn 22, N.Y.—T  
 Federal Screw Products Inc., 224 W. Huron St., Chicago 10, Ill.—L,N,O,P,Q  
 Gee-Lar Mfg. Co., 1330 10 Ave., Rockford, Ill.—L,K,X  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—A,C,K,L,N,O,P,Q,U,V,X  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—N,O,P,S  
 GENERAL ELECTRIC CO., LAMP DIV., Nela Park, Cleveland 12, Ohio—N,Q  
 General Products Corp., Union Springs, N.Y.—L  
 GENERAL RADIO CO., 275 Mass Ave., Cambridge 39, Mass.—E,L  
 Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.—F,H,L,T  
 Gurley, W. & L. E., 514 Fulton St., Troy, N.Y.—I,W  
 HELIPOT CORP., 916 S. Meridian Ave., S. Pasadena, Calif.—C,E,L,U  
 HEMINWAY & BARTLETT MFG. CO., 500 5 Ave., New York 36, N.Y.—A  
 Herzog Miniature Lamp Works, 12-23 Jackson Ave., Long Island City, N.Y.—P,Q  
 Hetherington, Inc., Sharon Hill, Pa.—Q  
 Hopp Press Inc., 460 W. 34 St., New York 1, N.Y.—H,T,W  
 Hudson Lamp Co., 528 Elm St., Arlington, N.J.—N,Q  
 Industrial Devices, Edgewater, N.J.—P  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—E,H,U  
 Insulating Fabricators of New England Inc., 69 Grove St., Watertown 72, Mass.—T  
 JOHNSON CO., E. F., Waseca, Minn.—E,L,N,M,O,P,Q  
 Karp Metal Products, 211 63 St., Brooklyn, N.Y.—J  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—F,N,P,Q  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—R,S  
 Keystone Watch Case Div., Riverside Metal Co., 1 Pavilion Ave., Riverside, N.J.—H  
 Kurz-Kasch, Inc., 1420 S. Broadway, Dayton 1, Ohio—L  
 Labelon Tape Co., 450 Atlantic Ave., Rochester 3, N.Y.—D  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—K  
 Long Inc., T. J., 215 Stonehinge Lane, Carle Place, L.I., N.Y.—T  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—I,L  
 Metalcraft, Inc., 1619 S. Federal Ave., Mason City, Iowa—T  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—T  
 Meyercord Co., 5323 W. Lake St., Chicago 45, Ill.—D  
 Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—E,T  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—D,E,G,L,R,S,U  
 Miller Electric Co., P. O. Box 1827, Jacksonville, Fla.—T,W  
 Minn. Pubber & Gasket Co., 3630 Wooddale Ave., Minneapolis 16, Minn.—L  
 Molded Insulation Co., 335 E. Price St., Philadelphia 44, Pa.—K,L  
 Molding Corp. of America, 40 Church St., Pawtucket, R.I.—L  
 Molding Spec. Inc., 52 Islin St., Yonkers 2, N.Y.—L  
 NATIONAL CO., 61 Sherman St., Malden 48, Mass.—E,G,K,L,R,S,U  
 Natural Lighting Corp., 1124 E. Colo. Blvd., Glendale 5, Calif.—T  
 Neal Feay Co., 427 Olive St., Santa Barbara, Calif.—I,K,T,W  
 New Products Co., 1071 E. 54 St., Indianapolis 20, Ind.—H,I,K,L,P,Q,T,U,W,Y  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—F  
 Owens-Illinois Glass Co., Madison & St. Clair Sts., Toledo 1, Ohio—L,T  
 Oxford Electric Corp., 3911 S. Michigan Ave., Chicago 15, Ill.—N,Q

Pacific Transducer Corp., 11921 W. Pico Blvd., Los Angeles 64, Calif.—K  
 Petroff, P. A., 127 Water St., New York 5, N.Y.—A,O,X  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—L  
 PHOTOCIRCUITS CORP., Glen Cove, N.Y.—I  
 Plastic Accessories, Inc., 91 Mercer St., New York 12, N.Y.—I,T,W  
 Plasticraft Products Co., 1 Station Pl., W. Nyack, N.Y.—T,W  
 PM Industries Inc., 280 Fairfield Ave., Stamford, Conn.—L  
 Poray, Inc., 3369 W. Grand Ave., Chicago 51, Ill.—C,H,T,W  
 Ports Mfg. Co., 3265 Belmont Ave., Fresno 2, Calif.—T,W  
 Precise Measurements Co., 942 Kings Hwy., Brooklyn 23, N.Y.—W  
 PRINTLOID, INC., 93 Mercer St., New York 12, N.Y.—I,T,W  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—L  
 Ralston Record Co., 110 Cedar Ave., Pitman 15, N.J.—L  
 RAYTHEON MFG. CO., Waltham 54, Mass.—L  
 Research Instrument Co. 233 Broadway, New York 7, N.Y.—G,T,W  
 Reiner Electronics Co., 152 W. 25 St., New York 1, N.Y.—L  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—K,L  
 Republic Spec. Service, 232 Washington St., New York 7, N.Y.—D  
 Richardson Co., Lockland, Cincinnati 15, Ohio—I,L  
 Roflan Co., Topsfield, Mass.—K,L,N  
 Screw Corp. of America, 103 Park Ave., New York 17, N.Y.—K  
 Semon Bache & Co., 636 Greenwich St., New York 14, N.Y.—P  
 Sillocks-Miller Co., 10 W. Parker Ave., Maplewood, N.J.—E,F,N,U  
 Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y.—N,O,P,Q,U  
 Stemac Co., 1277 S. Cherokee St., Denver 10, Colo.—T  
 Sun Dial Corp., P.O. Box 326, Caldwell, N.J.—E,F,H,O,T,U,W  
 Switzer Bros., 4732 St. Clair Ave., Cleveland 3, Ohio—D  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—H,L,Q,T  
 Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—E,L  
 Technology Instrument Corp., 53 Main St., Acton, Mass.—E,L  
 Telectro Industries Corp., 35-16 St. Long Island City 1, N.Y.—R  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—C,D,G,H,I,K,L,N,O,P,Q,T,U,V,W,X  
 Topflight Tape Co., 116 E. Market St., York, Pa.—T,Y  
 TUNG-SOL ELECTRIC INC., 95 8 Ave., Newark 4, N.J.—N,Q  
 T-V Products Co., 152 Sandford St., Brooklyn 5, N.Y.—U  
 Ucinite Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.—N,P,Q,U  
 Ultradyne Eng'g. Labs. Inc., P. O. Box 8007, Albuquerque, N. Mex.—K  
 United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.—N,U,X  
 U. S. Eng'g. Co., 521 Commercial St., Glendale 3, Calif.—R,S,U  
 U. S. Radium Corp., 535 Pearl St., New York 7, N.Y.—E,I,T,U  
 Universal Aviation Equip. Inc., 187 Lafayette St., New York 13, N.Y.—I,Q,T,W  
 Vari-Equip. Co., 35 Grove St., White Plains, N.Y.—L  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—C,L  
 Waldom Electronics Inc., 911 N. Larrabee St., Chicago 10, Ill.—E,H,I,J,K,L,T,R,S,U,W  
 Western Color-Graphics, 39 S.E. Salmon St., Portland 14, Ore.—H,I,Q,T,W  
 White Industries Inc., 421 W. 54 St., New York 19, N.Y.—J  
 Willson Camera Co., 1401 Lawrence Rd., Havertown, Pa.—T  
 Wood Co., A. M., 11938 E. Garvey Blvd., El Monte, Calif.—E,L

## 28—DRAFTING ROOM EQUIPMENT

Drafting instruments ..... A  
 Drafting paper ..... B  
 Drafting tables ..... C  
 Electric erasers ..... D  
 Ink ..... E  
 Lighting equipment ..... F  
 Pencils & accessories ..... G  
 Reproducing machines, blueprint ..... H  
 Sensitized paper ..... I  
 Slide Rules ..... J  
 Tracing cloth ..... K

Acheson Colloids Co., 1950 Washington Ave., Port Huron, Mich.—E  
 Art Specialty Co., 3245 W. Lake St., Chicago 24, Ill.—F  
 Berger Scientific Supplies, 342 Madison Ave., New York 17, N.Y.—A,J  
 Beseler Co., Chas., 60 Badger St., Newark 8, N.J.—H  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—A  
 Bruning Co., Charles, 4700 Montrose Ave., Chicago 41, Ill.—A,B,C,D,E,F,G,H,I,J,K  
 C-Thru Ruler Co., 827 Windsor St., Hartford, Conn.—A,J  
 Dietzgen Co., Eugene, 2425 Sheffield Ave., Chicago, Ill.  
 Eagle Pencil Co., 703 E. 13 St., New York, N.Y.—G  
 Eberhard Faber Pencil Co., 37 Greenpoint Ave., Brooklyn 22, N.Y.—G  
 General Aniline & Film Corp., Ozalid Div., Johnson City, N.Y.—H,I  
 Gerber Scientific Instrument Co., 162 State St., Hartford, Conn.—C  
 Griffin Co., John, 2157 James Ave., St. Paul 5, Minn.—G  
 Kent Metal Mfg. Co., 490 Johnson Ave., Brooklyn 37, N.Y.—F  
 Keuffel & Esser, Hoboken, N.J.—A  
 Kliegl Bros., 321 W. 50 St., New York 13, N.Y.—F  
 Labelon Tape Co., 450 Atlantic Ave., Rochester 3, N.Y.—G  
 Merix Chemical Co., 1021 E. 55 St., Chicago 15, Ill.—G  
 Post Co., Frederick, 3650 N. Avondale, Chicago, Ill.—A,B,C,D,E,G,H,I,J,K  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—A,G  
 Servo-Tek Products Co., 1086 Goffle Rd., Hawthorne, N.J.—A  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—A,B,C,D,E,F,G,H,I,J,K  
 Transformer Metal Products Corp., 343 W. 26 St., New York, N.Y.—F  
 Universal Drafting Machine, 7960 Lorain Ave., Cleveland 2, Ohio—A  
 Verd-a-Ray Corp., 615 Front St., Toledo 5, Ohio—F  
 Vibroscope Co., 6 E. 39 St., New York 16, N.Y.—A  
 Williams, Brown & Earle, 904-906 Chestnut St., Philadelphia 7, Pa.

## 29—FILTERS

Antenna ..... A  
 Bandpass ..... B  
 IF ..... E  
 Interference ..... F  
 Toroidal ..... C  
 Vestigial sideband ..... G  
 Wavetrap ..... D

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—A,D  
 Acro Transformer & Mfg. Corp., 26-02 4 St., Long Island City 2, N.Y.—B  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—F  
 AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—B,D,F  
 Airdesign, Inc., 241 Fairfield Ave., Upper Darby, Pa.—B  
 Airpax Products Co., P. O. Box 137, Middle River Baltimore 20, Md.—B  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.  
 Andersen Labs. Inc., 39 Talcott Rd., W. Hartford 10, Conn.—E  
 Andrew Corp., 363 E. 75 St., Chicago 19, Ill.—A  
 Artled Co., 367 Worthington St., Springfield 3, Mass.—A,B,D  
 Astron Corp., 255 Grant Ave., E. Newark, N.J.—A,D,F  
 Atlas Coil Winders, Inc., 39 Manhattan St., Stamford, Conn.—B  
 Audio Development Co., 2833 Thirteenth Ave., So., Minneapolis 7, Minn.—B  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—B,D  
 Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N.J.—D  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—A,B,D,F

## MILITARY DESIGNATIONS of FREQUENCY BANDS

P-band—225-390 MC (133.3-76.9 cm)  
 L-band—390-1550 MC (76.9-19.3 cm)  
 S-band—1550-5200 MC (19.3-5.77 cm)  
 X-band—5200-10,900 MC (5.77-2.75 cm)  
 K-band—10,900-36,000 MC (2.75-0.834 cm)  
 Q-band—36,000-46,000 MC (0.834-652 cm)  
 V-band—46,000-56,000 MC (0.652-0.536 cm)

Bird Electronic Corp., 1800 E. 38th St., Cleveland 14, Ohio—A  
 Birnbach Radio Co., 145 Hudson St., New York 13, N.Y.—F  
**BILLEY ELECTRIC CO.**, Union Station Bldg., Erie, Pa.—E  
 Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles 34, Calif.—A,B  
**BUD RADIO INC.**, 2118 E. 55 St., Cleveland 3, Ohio—D  
 Burnell & Co., Yonkers, N.Y.  
 Carad Corp., 93 Leland Ave., San Francisco 38, Calif.—B  
 Carbonneau Industries, 100 Lexington Ave. S. W., Grand Rapids, Mich.—F  
**CENTRALAB DIV., GLOBE-UNION INC.**, 900 E. Keefe Ave., Milwaukee 1, Wisc.—F  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—B  
 CGS Laboratories, Inc., 391 Ludlow St., Stamford, Conn.—A,B,D  
 Chicago Condenser Corp., 3255 W. Armitage Ave., Chicago 47, Ill.—F  
 Chicago Electronic Eng'g. Co., 3223 Armitage Ave., Chicago 47, Ill.—B  
 Chicago Transformer, 3501 Addison St., Chicago 18, Ill.—B  
**CINEMA EN'G. CO.**, Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.  
 Coil Winders, Inc., New York Ave., Westbury, L.I., N.Y.—A,B,D,E,F  
 Collins Radio Co., 855 35 St., N.E. Cedar Rapids, Ia.—A,B  
 Communication Accessories Co., Hickman Mills, Mo.—B,F  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—B  
 Continental Electronics Mfg. Co., 4212 S. Buckner Blvd., Dallas 10, Tex.—A  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—F  
 DeCoursey Eng'g. Lab., P. O. Box 235, Los Angeles 25, Calif.—B  
 Delta Radio Co., 115 Worth St., New York 13, N.Y.—D  
 Deutschmann Corp., Tobe, Providence Highway, Norwood, Mass.—A,B,D,F  
 Dietz Design & Mfg. Co., Grandview, Mo.—B,D  
 Dorne & Margolin, 30 Sylvester St., Westbury, N.Y.—A  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—A,B,D  
 Dunkle Coil Co., 3257 W. 6 St., Los Angeles, Calif.—D  
 Eastern Electronic Products, 2 Manor House Square, Yonkers, N.Y.—A,B,D  
 Eldico of N.Y. Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—F  
 Electro Assemblies, Inc., 2935 W. Belmont Ave., Chicago 18, Ill.—B  
 Electronic Transformer Co., 207 W. 25 St., New York, N.Y.—B,D  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—A,B,D  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—B  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—E  
 Empire State Labs., 2608 Merrick Rd., Bellmore, L.I., N.Y.—B  
 EPCO Electronics, 140 Liberty St., New York, N.Y.—F  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,D  
 Fast & Co., John E., 3101 N. Pulaski Rd., Chicago 41, Ill.—F  
 Ferranti Electric Inc., 30 Rockefeller Plaza, New York 20, N.Y.—B  
 Filtron Co., Flushing, L.I., N.Y.—D,F  
**FREED TRANSFORMER CO.**, 1718 Weirfield St., Brooklyn 27, N.Y.—B  
**GENERAL ELECTRIC CO.**, Radio-TV Dept., Electronics Park, Syracuse, N.Y.—D  
 General Instrument Corp., 829 Newark Ave., Elizabeth 3, N.J.—B  
**GENERAL RADIO CO.**, 275 Mass. Ave., Cambridge 39, Mass.—B  
 Geotronic Labs., Inc., 1314 Cedar Hill Ave., Dallas 11, Texas—B  
**GERTSCH PRODUCTS.** 11846 Miss. Ave., Los Angeles 25, Calif.—B  
 Glenco Corp., Metuchen, N.J.—F  
 Grayburne Corp., 4 Radford Pl., Yonkers, N.Y.—A,D  
 Gudeman Co., 340 W. Huron St., Chicago 10, Ill.—B  
**GULTON MFG. CORP.**, 212 Durham Ave., Metuchen, N.J.—B,F  
 Hallet Mfg. Co., 1601 W. Florence, Inglewood, Calif.—F  
 Harder Co., Donald C., 3338 India St., San Diego 1, Calif.—B  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—B,D  
 Hillburn Electronic Products Co., 55 Nassau Ave., Brooklyn 22, N.Y.—A,D  
 Hindle Transformer Co., Flemington, N.J.—B  
 HI Q Div. Aerovox Corp., Olean, N.Y.—B,D,F  
 Hughey & Phillips, P. O. Box 686, Encino, Calif.—A  
 Hycor Co., 11423 Vanowen St., N. Hollywood, Calif.—B  
 Industrial Condenser Co., 3243 N. Calif Ave., Chicago 18, Ill.—F  
 Industrial Transformer, Gouldsboro, Pa.—B  
 Johnson Electronics, P. O. Box 2023, Municipal Airport, Orlando, Fla.—B,D  
 Johnson Labs., Industries, Willard Rd., Norwalk, Conn.—A,B,D  
**KELLOGG SWITCHBOARD & SUPPLY**, 79 W. Monroe St., Chicago 3, Ill.—B

# ELECTRONIC INDUSTRIES DIRECTORY

**KENYON TRANSFORMER CO.**, 840 Barry St., Bronx 59, N.Y.—B  
**JAMES KNIGHTS CO.**, Sandwich, Ill.—E  
 JFD Mfg. Co., 6101 16 Ave., B'klyn., N.Y.—A,D  
 Krohn-Hite Instrument Co., 580 Mass. Ave., Cambridge 39, Mass.—B,D  
 K-V Transformer Corp., 20 E. Franklin St., Danbury, Conn.—B,F  
 La Pointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—A  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—A,B  
 Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—B  
 Leonard Electric Products Co., 67 34 St., Brooklyn 32, N.Y.—D  
 LePace Mfg. Co., 75-19 64th St., Glendale 27, N.Y.—B  
 Lynch Carrier Systems, 96 Jessie St., San Francisco 5, Calif.—B  
 Magnatron Inc., 246 Schuyler Ave., Kearny, N.J.  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,B,D  
**MALLORY & CO., P.R.**, 3029 E. Washington St., Indianapolis 6, Ind.—F  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—A,B  
 Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.—A,B,D,F  
 Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 37, N.Y.—B  
 Microtran Co. Div. Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach, L.I., N.Y.—B  
**MIDLAND MFG. CO.**, 3155 Fiberglass Rd., Kansas City 15, Mo.—E  
 Miller Co., J.W., 5917 S. Main St., Los Angeles 3, Calif.—B,D,F  
 Milwaukee Transformer Co., 5231 N. Hopkins St., Milwaukee 9, Wisc.  
 Monitor Products Co., 815 Fremont Ave., S. Pasadena, Calif.—E  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—B  
 National Electronics Mfg. Corp., 42-08 Vernon Blvd., Long Island City 1, N.Y.—F  
 Network Mfg. Corp., 213 W. 5 St., Bayonne, N.J.—F  
 Non-Linear Systems, Box "S," Del Mar, Calif.—D  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—A,B,D,F  
**PHOTOCIRCUITS CORP.**, Glen Cove, N.Y.—A,B,D  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—A  
 Polyphase Instrument Co., 705 Haverford Rd., Bryn Mawr, Pa.—B  
 Potter Co., 1950 Sheridan Rd., North Chicago, Ill.—D,F  
**PYRAMID ELECTRIC CO.**, 1445 Hudson Blvd., N. Bergen, N.J.—F  
 Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill.—D  
 Radio Music Corp., 84 S. Water St., Port Chester, N.Y.—B,D  
 Railway Communications, Inc., Raytown, Mo.—B  
**RAYPAR, INC.**, 7800 W. Addison St., Chicago 34, Ill.  
**REEVES-HOFFMAN CORP.**, 145 Cherry St., Carlisle, Pa.—E  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—A,B,D,F  
**RAYTHEON MFG. CO.**, Waltham 53, Mass.  
 R.K. Mfg. Co., P. O. Box 112, Marion, Ill.—B  
 Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—B  
 Sickles Div., F.W., General Instrument Corp., P. O. Box 330, Chicopee, Mass.—A,D  
 Slate & Associates, Claude C., 11370 W. Olympic Blvd., Los Angeles 64, Calif.—A,B,D  
 Southern Electric & Transmission Co., 3127 Holmes St., Dallas, Texas—B  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—B  
 Sparton Radio TV, 2400 E. Ganson St., Jackson, Mich.—D  
 Specialties, Inc., Skunks Misery Rd., Syosset, L.I., N.Y.—B  
 Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—B,D  
**SPRAGUE ELECTRIC CO.**, 233 Marshall St., North Adams, Mass.—F  
 Square Root Mfg. Co., 391 Saw Mill River Rd., Yonkers, N.Y.—A,B,D  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—A,B,D  
 Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N.Y.—A,D  
 Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—A,D  
 Technicraft Labs., Inc., Thomaston-Waterbury Rd., Thomaston, Conn.  
 Telectro Industries, 35-16 37 St., Long Island City, N.Y.—F  
 Tele-Matic Industries, Inc., 1 Joralemon St., Brooklyn 2, N.Y.—A,B,D

Television Labs. Inc., 5045 W. Lake St., Chicago 44, Ill.—B  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—E  
 Thordarson-Meissner Mfg., Mt. Carmel, Ill.—F  
 Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—B  
 Torwico Electronics, 967 Frelinghuysen Ave., Newark 5, N.J.—B  
 Transformer Engineers, 161 E. California St., Pasadena 1, Calif.—B  
 Transformer Technicians, 2608 N. Cicero Ave., Chicago 39, Ill.—B  
 Trans-Sonics, Inc., Bedford Airport, Bedford, Mass.—B  
 Tri-Dex Co., P. O. Box 1207, Lindsay, Calif.—A,B  
 United Pressed Products Co., 741 W. Harrison St., Chicago 7, Ill.—A,D  
 U.S. Electronics Corp., 275 Warren St., Lyndhurst, N.J.—A,B,F  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—A,B,D  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—B,D  
 Univex Corp., 102 Warren St., New York 7, N.Y.—A  
 Valpey Crystal Corp., 1274 Highland St., Holliston, Mass.—E  
 Vanguard Electronics Co., 3384 Motor Ave., Los Angeles 34, Calif.—A,B,D  
**VECTRON, INC.**, 400 Main St., Waltham 54, Mass.—B,E  
 Vidaire Electronics Mfg. Co., 576 W. Merrick Rd., Lynbrook, Long Island, N.Y.—A,B,D  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—A,B,D  
 White Industries, Inc., 421 W. 54 St., New York 19, N.Y.—A,B  
 Wilcox Research Corp., 340 LaBrea Ave., Los Angeles 36, Calif.—D  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—B  
 Yonkers Industries, 28-30 School St., Yonkers, N.Y.—F

## 30—GAGES

**Gages, comparator . . . . . A**  
**Gages, dimension . . . . . B**  
**Gages, displacement . . . . . C**  
**Gages, fuel, electronic . . . . . D**  
**Gages, inspection, electronic . . . . . E**  
**Gages, ionization . . . . . F**  
**Gages, pirani . . . . . G**  
**Gages, pressure, electronic . . . . . H**  
**Gages, vacuum . . . . . I**

Acme Industrial Co., 200 N. Leffin St., Chicago 7, Ill.—A  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—A,B,C,D,E,H  
**AIRTRON INC.**, 1109 W. Elizabeth Ave., Linden, N.J.—D  
 Alina Corp., 401 Broadway, New York 13, N.Y.—A  
 Arlin Products, Inc., 13541 Auburn Ave., Detroit 23, Mich.—A,E  
 Aviation Eng'g Corp., 58-15 Northern Blvd. Woodside, L.I., N.Y.—D  
 Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.—H  
 Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—F  
**BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS INC.**, 2200 Wright Ave., Richmond, Calif.—E,H  
 Bourns Labs., 6135 Magnolia Ave., Riverside, Calif.—C  
 Branson Instruments Inc., 430 Fairfield Ave., Stamford, Conn.—E  
 Bristol Co., Waterbury 20, Conn.—D,I  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—D  
**BRUSH ELECTRONICS CO.**, 3405 Perkins Ave., Cleveland 14, Ohio—A,C,D,E  
 Central Sales & Mfg. Corp., Denville, N.J.—F,G,I  
 Central Scientific Co., 1700 W. Irving Park Rd., Chicago, Ill.—F,G,I  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—C  
 Clarke Instruments, 919 Jesup-Blair Dr., Silver Spring, Md.—I  
 Colvin Labs., 12 Court St., Morristown, N.J.—C  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—D,G,I  
 Consolidated Vacuum Corp., 735 Ridge Rd. W., Rochester 3, N.Y.—F,G,I  
 Control Eng'g. Corp., 560 Providence Highway, Norwood, Mass.—C,D,H  
 Defender Instrument & Regulator Co., 815 Clark Ave., St. Louis 2, Mo.—I  
 Dice Co., J. W., 1 Engle St., Englewood, N.J.—E  
 Dietz Co., H. G., 12-16 Astoria Blvd., Long Island City 2, N.Y.—H  
 DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.—A  
**EITEL-McCULLOUGH, INC.**, 798 San Mateo Ave., San Bruno, Calif.—F  
 Electric Eye Equip. Co., 6 W. Fairchild St., Danville, Ill.—E  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—E





South River Metal Products Co., 377 Old Bridge Turnpike, South River, N.J.—A,C,I,Q,S,Z,AG  
 Spaulding Fibre Co., 310 Wheeler St., Tonawanda, N.Y.—B, K, L, S, V, AG, AK, AN, Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—A,B,C,H,K,AG, Spring Packing Corp., 332 S. Michigan Ave., Chicago, Ill.—J  
 Standard Pressed Steel Co., Box 899, Jenkintown, Pa.—S,T,Y,Z  
 Star Expansion Products Co., 147 Cedar St., New York 6, N.Y.—A,B,H,I,L,S,U,AG  
 Star Fuse Co., 235 Canal St., New York 13, N.Y.—E  
 Staver Co., 41-51 N. Saxon Ave., Bay Shore, N.Y.—D,I,V,AF,AG,AM  
 Steel Co., Herman D., Lafayette Bldg., Philadelphia 6, Pa.—Z  
 Stewart Mfg. Corp., F. W., 4311 Ravenswood Ave., Chicago 13, Ill.—AA,AC  
 Stone City, P. O. Box 351, Bedford, Ind.—D, I, N,Q,AG,AI,AK,AM  
 Stronghold Screw Products, 216 W. Hubbard St., Chicago 10, Ill.—A,I,S,W,X,Y,Z,AI,AL,AM  
 Suckle Electronics Co., 22nd & Hayes Ave., Camden 5, N.J.—AA,AE  
 Swiss Jewel Co., Lafayette Bldg., Philadelphia 6, Pa.—AAS  
 Switchcraft, Inc., 1328 N. Halstead St., Chicago, Ill.—U  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—AG  
 Tallen Co., 159 Carlton Ave., B'klyn. 5, N.Y.—U  
 Technicraft Labs., Inc., Thomaston-Waterbury Rd., Thomaston, Conn.—H  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—C,H,K,AE  
 Teletronics Lab., Westbury, L.I., N.Y.—L  
 Telex, Inc., 1633 Eustis St., St. Paul, Minn.—HAN  
 Tempo T-V Products Co., 2450 Ramona Blvd., Los Angeles 33, Calif.—Q,V  
 Thompson Bremer & Co., 1640 W. Hubbard St., Chicago 42, Ill.—S,AL,AM  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,D,E,G,J,K,L,M,Q,S,T,U,X,Y,Z,AI,AJ,AK,AL,AM,AN,AO  
 THOR CERAMICS, INC., 225 Belleville Ave., Bloomfield, N.J.  
 TINNEMAN PRODUCTS, INC., P.O. Box 6688, Cleveland 1, Ohio—C,I,R,S,V  
 Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.  
 T.L.G. Electric Corp., 31 W. 27 St., New York 1, N.Y.—C  
 Torwico Electronics, 967 Frelinghuysen Ave., Newark 5, N.J.—B  
 Transcoil Corp., 107 Grand St., New York 13, N.Y.—L  
 Tricon Mfg. Co., 8008 Wallace St., Chicago 20, Ill.—G,AG  
 Tri-Dex Co., P. O. Box 1207, Lindsay, Calif.  
 T-V Products Co., 152 Sandford St., Brooklyn 5, N.Y.—C,Q,AE,AG  
 Ucinite Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.—I,M,T,U,AG  
 United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.—C,I,M,U,S,AE,AG  
 United Screw & Bolt Corp., 2513 W. Cullerton St., Chicago 8, Ill.—A,I,S,X,Y,Z,AI,AL,AM  
 U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.—B,Q,S,AB  
 Universal Specialty Co., P. O. Box 1892, Boston 5, Mass.—S  
 Univex Corp., 102 Warren St., New York 7, N.Y.—AE  
 U. S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—B,K,M,V,AA,AC,AN  
 Vector Electronic Co., 3352 San Fernando Rd., Los Angeles 65, Calif.—U  
 Vidair Electronics Mfg. Co., 576 W. Merrick Rd., Lynbrook, N.Y.—Q  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—D,E  
 Waldes Kohinoor Inc., 47-16 Austel Pl., Long Island City 1, N.Y.—V  
 Waldom Electronics, Inc., 911 N. Larrabee St., Chicago 10, Ill.—O  
 WALL MFG. CO., Grove City, Pa.—AG  
 WECKESSER CO., 5621 N. Avondale Ave., Chicago 30, Ill.—C  
 Western Gear Works, P. O. Box 182, Los Angeles, Calif.—L  
 Western Int'l. Co., 45 Vesey St., New York 7, N.Y.—D,E,U,AA,AB  
 Westfield Metal Products, Westfield, Mass.—AAS  
 WHITE & SONS, JAMES L., 374 Verona Ave., Newark 4, N.J.—C,L  
 WHITE DENTAL MFG. CO., S. S., 10 E. 40 St., New York, N.Y.—AA,AC  
 Whitehead Stamping Co., 1661 W. Lafayette Blvd., Detroit 16, Mich.—C,P,AG,AI,AK,AM  
 Willard Storage Battery Co., 1220 Huron Rd., Cleveland, Ohio—C  
 Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.—K,M,AG,AK  
 Wilson Co., H.A., U.S. Route 22, Union, N.J.—G  
 Worcester Pressed Aluminum Corp., 13 Hope Ave., Worcester, Mass.—AG  
 Wrought Washer Mfg. Co., 2275 S. Bay St., Milwaukee 7, Wisc.—AG,AI,AJ,AK,AL,AM  
 Zierick Mfg. Corp., Beechwood & Rockdale Ave., New Rochelle, N.Y.—C,AG

### 32—HEADPHONES

**Headphones, crystal** ..... A  
**Headphones, dynamic** ..... B  
**Headphones, hearing aid** ..... C  
**Headphones, magnetic** ..... D

Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—B,D  
 British Electronic Sales, 23-08 45 Rd., L.I., N.Y.—C  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—B,D  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—A  
 Cannon Co., C.F.—Springwater, N.Y.—D  
 Communication Devices Co., 2331 12 Ave., New York City 27, N.Y.—D  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—D  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,B,D  
 Ectro, Inc., 425 Sandusky St., Delaware, Ohio—A  
 GULTON MFG. CORP., 212 Duryham Ave., Metuchen, N.J.—A  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City, N.Y.—D  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—D  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—A  
 Permaflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—A,B,D  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—D  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—B,D  
 Roanwell Corp., 662 Pacific St., Brooklyn 17, N.Y.—D  
 Sears Co., M.J., 52 Clark St., Brooklyn 2, N.Y.—B,D  
 Sonotone Corp., Elmsford, N.Y.—C,D  
 Stromberg-Carlson Co., Rochester 3, N.Y.—B  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,C,D  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—D  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—B,C,D  
 Trimm, Inc., Libertyville, Ill.  
 U S Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—A,B

### 33—INDICATORS

**Indicators, antenna position** ..... A  
**Indicators, broadcast** ..... B  
**Indicators, density** ..... C  
**Indicators, detonation** ..... D  
**Indicators, dielectric constant** ..... E  
**Indicators, film thickness** ..... F  
**Indicators, fluid conductivity** ..... G  
**Indicators, fluid flow** ..... H  
**Indicators, frequency** ..... I  
**Indicators, hardness** ..... J  
**Indicators, humidity** ..... K  
**Indicators, illumination** ..... L  
**Indicators, liquid level** ..... M  
**Indicators, materials thickness** ..... N  
**Indicators, moisture** ..... O  
**Indicators, ocean depth** ..... P  
**Indicators, oxygen** ..... Q  
**Indicators, PH** ..... R  
**Indicators, photographic exposure** ..... S  
**Indicators, positioning** ..... T  
**Indicators, power level** ..... U  
**Indicators, pressure** ..... V  
**Indicators, radiation** ..... W  
**Indicators, R-F** ..... X  
**Indicators, servo** ..... Y  
**Indicators, shorted turn** ..... Z  
**Indicators, smoke & combustion** ..... AA  
**Indicators, sound level** ..... AB  
**Indicators, specific gravity** ..... AC  
**Indicators, strain** ..... AD  
**Indicators, telemetering** ..... AE  
**Indicators, temperature** ..... AF  
**Indicators, timing** ..... AG  
**Indicators, torque** ..... AH  
**Indicators, turbidity** ..... AI  
**Indicators, vacuum** ..... AJ  
**Indicators, volume** ..... AK  
**Indicators, weight** ..... AL

Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—E,G,H,K,M,N,O,T,V,Y,AD,AE,AF,AG,AH,AL  
 Aerolux Light Corp., 653 11 Ave., New York 36, N.Y.—W

Aeronautical Electronics, Raleigh-Durham Airport, P. O. Box 6043, Raleigh, N.C.—T  
 Airborne Electronics Co., Hangar 6, Metropolitan Airport, Van Nuys, Calif.—A  
 AIRKRON, INC., 1109 W. Elizabeth Ave., Linden, N.J.—H  
 Alco Mfg. Co., 4011 Cuming St., Omaha 3, Nebr.—W  
 Alina Corp., 401 Broadway, New York 13, N.Y.—L  
 Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio—A  
 American Chronoscope Corp., 316 W. 1 St., Mt. Vernon, N.Y.—AG  
 American Instrument Co., Silver Spring, Md.—K,O,R  
 American Optical Co., Instrument Div., Box A, Buffalo 15, N.Y.—J  
 Anton Electronic Labs., 1226 T Flushing Ave., Brooklyn 37, N.Y.—C,F,H,W  
 Applied Science Corp. of Princeton, P. O. Box 44, Princeton, N.J.—AE  
 Atlas Metal Stamping Co., Castor & Kensington Aves., Philadelphia 24, Pa.—A  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—W  
 Atomlab, Inc., 489 5 Ave., New York 17, N.Y.—W,AG  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—Y,AB,AE  
 Austin Co., Special Devices Div., 76 9 Ave., New York 11, N.Y.—T,Y,AE  
 Automatic Temperature Control Co., 5212 Pulaski Ave., Philadelphia 44, Pa.—F,H,K,M,N,O,V,Y,AG,AJ,AL  
 Aviation Eng'g. Corp., 58-15 Northern Blvd., Woodside, L.I., N.Y.—C,E,Y,AF  
 Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio—H,M,Q,R,V,AE,AF,AJ  
 Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.—M,P,V,AD,AG,AL  
 Barber-Colman Co., 1300 Rock St., Rockford, Ill.—AF  
 Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—I  
 Bar-Ray Products Inc., 209 25 St., Brooklyn 32, N.Y.—AF  
 Barton Electronics, Inc., 955 Asylum Ave., Hartford 5, Conn.—M,T  
 Beckman Instruments Inc., 820 Mission St., S. Pasadena 1, Calif.—R  
 Beckman & Whitley Inc., 985 San Carlos Ave., San Carlos, Calif.—D,AF  
 BENDIX AVIATION CORP., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif.—A,M,P,T,AE  
 BERKELEY SCIENTIFIC, Div. Beckman Instruments Inc., 2200 Wright Ave., Richmond, Calif.—H,I,T,V,AF,AG  
 Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.—I  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—W,X  
 Boston Auto Gage Co., 70 West St., Pittsfield, Mass.—M  
 Bourns Labs., 6135 Magnolia Ave., Riverside, Calif.—T,V,AJ  
 Branson Instruments Inc., 430 Fairfield Ave., Stamford, Conn.—F,N  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,B,E,G,I,L,T,U,X,Y,AA,AB,AD,AE,AG,AK  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—G,Z,AB,AD,AH  
 Burlington Instrument Co., Burlington, Iowa—AG  
 B/W Controller Corp., 2200 E. Maple Rd., Birmingham, Mich.—M  
 Cambridge Instrument Co., Grand Central Terminal, New York 17, N.Y.—K,Q,R  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—S  
 Central Sales & Mfg. Corp., 1 Richwood Pl., Denville, N.J.—AJ  
 Central Scientific Co., 1700 W. Irving Park Rd., Chicago, Ill.—R,AF,AJ  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—Y,AD,AE  
 Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—H,N,R,T,V,W,AD,AE,AF,AG,AH,AL  
 Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Ia.—T  
 Colvin Labs., 12 Court St., Morristown, N.J.—V  
 Combustion Control Corp., 718 Beacon St., Boston 15, Mass.—AA  
 Conn. Ltd., C. G., Elkhart, Ind.—I  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—V,W,AD,AJ  
 Consolidated Vacuum Corp., 735 Ridge Rd., W., Rochester 3, N.Y.—AJ  
 Control Eng'g. Corp., 560 Providence Hwy., Norwood, Mass.—H,T,Y,AD,AF,AL  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—A  
 Corning Glass Works, P. O. Box 544, Corning, N.Y.—W  
 Cramer Co., R. W., Box #49, Centerbrook, Conn.—AG  
 Dage Electronics Corp., 69 N. 2 St., Beech Grove, Ind.—M,T,AA,AE  
 Daven Co., 191 Central Ave., Newark 4, N.J.—I,U,AB,AK  
 Decade Instrument Co., Box 153, Caldwell, N.J.—I  
 Defender Instrument & Regulator Co., 815 Clark Ave., St. Louis 2, Mo.—V,AA,AJ  
 Deitz Co., S.J., 38 River Edge Rd., River Edge, N.J.—M



# ELECTRONIC INDUSTRIES DIRECTORY

Delaware Optical Labs, 36 Williams St., Lansdowne, Pa.—S  
De-Tec-Tronic Labs., 1711 Terra Cotta Pl., Chicago 14, Ill.—AA,AI  
Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—I  
Diatron Co., 3327 Dixie Dr., Houston 21, Tex.—I,M,Z,AD  
Dice Co., J. W., 1 Engle St., Englewood, N.J.—F,N  
Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—I,AG  
Dillon & Co., W. C., 14620 Keswick St., Van Nuys, Calif.—AF,AL  
Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio—AG  
DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.—N  
Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—T,AE  
Dubrow Development Co., 235 Penn St., Burlington, N.J.—A  
Duncan & Bayley, 785 Hertel Ave., Buffalo 7, N.Y.—Y  
ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N.J.—H,M,T,V  
Electric Design & Mfg. Co., Jefferson St., Burlington, Iowa—X  
Electric Eye Equip. Co., 6 W. Fairchild St., Danville, Ill.—N,Y,AL,AL  
Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasia, Pa.—A  
Electro-Mechanical Research, Inc., 64 Main St., Ridgefield, Conn.—AE  
Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—F,AA  
Electronic Products Co., 11 E. 3 St., Mount Vernon, N.Y.—W  
Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—AD  
Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—H,AG  
Electro-Physics Co., 287 Broadway, New York 7, N.Y.—S  
ELECTRO PRODUCTS LABS., 4501 N. Ravenswood Ave., Chicago, Ill.—D,V  
Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—K,O,AA,AF,AG  
Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.—M,S  
Ellis Associates, Box 77, Pelham, N.Y.—AD  
Ellison Draft Gage Co., 548 W. Monroe St., Chicago 6, Ill.—Q,V  
Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—I  
Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A,X  
Eng'g. Research & Devel., Addison, Ill.—D  
Eng'g. Research Associates Inc., Div. Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—T,AL  
Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—I,R,AF  
Ernst Norrman Labs., Williams Bay, Wis.—AF  
Esprey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,I,U,W,X,AE  
Ess Instrument Co., 96 S. Washington Ave., Bergenfield, N.J.—AA,AI  
Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—I  
Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—I,X,AB,AF  
Filtors, Inc., 30 Sagamore Hill Dr., Port Washington, N.Y.—I  
Fischer & Porter Co., 19 Warminister Rd., Hatboro, Pa.—C,M,V,AC,AE,AF  
Fisher Research Lab. Inc., 1961 Univ. Ave., Palo Alto, Calif.—M  
Flader Inc., Frederic, 583 Division St., N. Tonawanda, N.Y.—V  
Fordham Mfg. Co., 2220 Pearsall Ave., New York 69, N.Y.—L  
Foxboro Co., 38 Neponset Ave., Foxboro, Mass.—C,E,G,H,K,M,N,O,Q,R,T,V,AD,AF,AL,AL  
Gale Mechanisms Inc., Dorothea, 81-01 Broadway, Elmhurst, L.I., N.Y.—AG  
Gardner Lab. Inc., H. A., 4723 Elm St., Bethesda 14, Md.—F,J,N  
Gaskins Co., 1005 S. Auroraway, Wheaton, Ill.—X,AF,AG  
GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—B  
Gavco Corp., 540 E. 80 St., New York, N.Y.—H  
General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—W  
GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B,F,I,L,O,S,T,V,AD,AE,AF,AG,AH,AI,AJ,AAA  
GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—I,W,AB  
Genisco, Inc., 2238 Federal Ave., Los Angeles 64, Calif.—T,V  
Georator Corp., Manassas, Va.—W  
Giannini & Co., G. M., 590 S. Fair Oaks, Pasadena 2, Calif.—V,AE  
G-M Labs. Inc., 4300 N. Knox Ave., Chicago 41, Ill.—S  
Gorrell & Gorrell, Haworth, N.J.—M,T,AG  
Gow-Mac Instrument Co., 22 Lawrence St., Newark 5, N.J.—Q  
GULTON MFG. CO., 212 Durham Ave., Metuchen, N.J.—E,V,AD  
G. W. Associates, P. O. Box 2263, El Segundo, Calif.—X  
Haley Electronics Co., 57 William St., New York 5, N.Y.—H,M,AG  
Hanson-Gorrell-Brian, 1 Continental Hill, Glen Cove, N.Y.—Y,AF  
Hastings Instrument Co., Superhighway at Pine Ave., Hampton, Va.—H,V,AJ

Hays Corp., E. 8 St., Michigan City, Ind.—H,Q,V  
Healy-Ruff, 772 Hampden Ave., St. Paul 14, Minn.—M,V  
Herzog Miniature Lamp Works, 12-23 Jackson Ave., Long Island City, N.Y.—L  
HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—I,U  
Hoke, Inc., 136 S. Dean St., Englewood, N.J.—H  
Hughey & Phillips, P. O. Box 686, Encino, Calif.—L  
Huppert Co., K. R., 6830 Cottage Grove Ave., Chicago 37, Ill.—AF  
Industrial Control Co., Straight Path & Arlington Ave., Wyandanch, N.Y.—T,Y  
Industrial Electronics, 8060 Wheeler St., Detroit 10, Mich.—N,T,V,AD,AH,AJ,AL  
Industrial Instruments Inc., 89 Commerce Rd., Cedar Grove, N.J.—G  
Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus 12, Ohio  
Industrial Timer Corp., 115 Edison Pl., Newark 5, N.J.—AG  
Instrument Devel. Labs. Inc., 163 Highland Ave., Needham Heights 94, Mass.—L  
iq industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—E,F,G,L,M,N,O,T,AA,AG  
J-B-T INSTRUMENTS, 441 Chapel St., New Haven, Conn.—I,AF  
Kalbfell Labs. Inc., 1090 Morena Blvd., San Diego 10, Calif.—Y  
Kartron, 7882 Kartron St., Huntington Beach, Calif.—Z  
Kearfott Co., 1150 McBride Ave., Little Falls, N.J.—Y  
KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—Y,AH,AL  
Kinetix Inst. Co., 902 Broadway, New York 10, N.Y.—Y  
Kliegl Bros., 321 W. 50 St., New York 19, N.Y.—L  
Kocour Co., 3504 W. 48 St., Chicago 32, Ill.—R  
LaMotte Chemical Products Co., Baltimore 4, Md.—R  
Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—A  
Liquidepth Indicators Inc., 43-22 10 St., Long Island City 1, N.Y.—M  
Liston-Becker Instrument Co., 649 Hope St., Springdale, Conn.—Q  
Litton Eng'g. Labs., 1049 Brittan Ave., San Carlos, Calif.—AJ  
Lord-Taber Co., 40 Ontario St., Canandaigua, N.Y.—AF  
Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill.—M,AA,AG  
Magnafux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.—N  
MAGNAVOX CO., Ft. Wayne 4, Ind.—V  
Magnetic Amplifiers Inc., 632 Tinton Ave., New York 55, N.Y.—A,G,M,T,U,Y,AH  
Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—W,X,Y  
Manning, Maxwell & Moore, 250 E. Main St., Stratford, Conn.—Y  
Marconi Instruments Ltd., 23-25 Beaver St., New York 4, N.Y.—E,I,K,O,R,Y  
Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—L,S,AG  
Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—AG  
Massa Labs. Inc., 5 Fottler Rd., Hingham, Mass.—AB  
McNeill Eng'g. Co., 4057 W. Van Buren St., Chicago 24, Ill.—AA  
Menlo Research Lab., P. O. Box 522, Menlo Park, Calif.—R,W  
Micro-Circuits Co., New Buffalo, Mich.—AF  
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—I  
Minneapolis Honeywell Regulator Co., Industrial Div., 7 & Grange Sts., Philadelphia 20, Pa.—G,H,I,K,M,R,V,W,AC,AF,AJ  
Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.—Q,AA  
Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—AJ  
National Instrument Co., 23 E. 26 St., New York 10, N.Y.—A  
National Research Corp., Equip. Div., 70 Memorial Dr., Cambridge 42, Mass.—AJ  
Network Mfg. Corp., 213 W. 5 St., Bayonne, N.J.—G,X  
Northeastern Eng'g. Corp., S. Bedford St., Manchester, N.H.—P,V,Y  
Nosker Eng'g. Products, 1216 Livermore St., Yellow Springs, Colo.—AD  
Nuclear Instrument & Chem. Corp., 223 W. Erie St., Chicago 10, Ill.—W  
Nuclear Measurements, 2460 N. Arlington Ave., Indianapolis 18, Ind.—W  
Nuclear Research & Devel. Co., 6425 Etsel Ave., St. Louis 14, Mo.—W  
Nucleonic Co. of America, 497 Union St., Brooklyn 31, N.Y.—W  
Ohmart Corp., 2347 Ferguson Rd., Cincinnati 38, Ohio—C,F,M,N,W,AC,AK,AL

Oster Mfg. Co., John, 1 Main St., Racine, Wis.—Y  
Panoramic Radio Products, 10 S. 2 Ave., Mt. Vernon, N.Y.—AE  
Pantek Co., 208 42 St., Manhattan Beach, Calif.—I  
Penn Industrial Instrument Corp., 4110 Haverford Ave., Philadelphia 4, Pa.—H,M,AE,AF  
Pereny Equip. Co., 893 Chambers Rd., Columbus 12, Ohio—AF  
Petroff, P. A., 127 Water St., New York 5, N.Y.—A  
Phila. Scientific Glass Co., 4 Eckard Ave., Abington, Pa.—O,AC,AF  
Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—H,L,S,Y,AA,AD  
Photobell Co., 116 Nassau St., New York 38, N.Y.—H,AA  
Photocon Research Pro., 421 N. Foothill Blvd., Pasadena 8, Calif.—N,V  
Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—G,M,AG  
Pioneer Electronics Corp., 24 Saunders St., Salem, Mass.—AJ  
Polarizing Instrument Co., Irvington-on-Hudson, N.Y.—AD  
Polyphase Instrument Co., 705 Haverford Rd., Bryn Mawr, Pa.—AD,AH  
Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—I  
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—W  
Precision Radiation Instruments, 2235 S. La Brea, Los Angeles 16, Calif.—C,N,W  
Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia 30, Pa.—K,M,AC,AF,AJ  
Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—I,Y,AE  
Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N.Y.—R,AJ  
Pyrometer Instrument Co., 92 Portland Ave., Bergenfield, N.J.—AF  
Radioactive Products Inc., 443 W. Congress, Detroit 26, Mich.—F,M,W  
Radiation Counter Labs. Inc., 5122 W. Grove St., Skokie, Ill.—W  
RADIO CORP. OF AMERICA, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J.—B  
Rahm Instruments, 12 W. Broadway, New York 7, N.Y.—V  
RAYTHEON MFG. CO., Waltham 54, Mass.—H,P  
Remington Rand Inc., Eng'g. Research Associates Div., 1902 W. Minnehaha Ave., St. Paul, Minn.—T,AL  
Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—W,X,Y,AA,AE,AF  
Research Electronics Labs., Roslyn, Pa.—AJ  
Rhodes Inc., M. H., 30 Bartholomew Ave., Hartford 6, Conn.—AG  
Rich-Roth Labs., 1240 Main St., Hartford 3, Conn.—H,N  
Ripley Co., Middletown, Conn.—AA  
Robinette Co., W. C., 802 R. Fair Oaks Ave., S. Pasadena, Calif.—T,Y  
Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—S,Y,AF  
Ruge-de Forest Inc., 84 Mass. Ave., Cambridge 39, Mass.—V,AD,AH,AJ,AL  
Rust Industrial Co., 608 Willow St., Manchester, N.H.—T,AE  
Rutherford Electronics Co., 3707 S. Robertson Blvd., Culver City, Calif.—AG  
Rutishauser Corp., 490 S. Fair Oaks Ave., Pasadena 1, Calif.—V  
Saxl Instrument Co., Pine Hill, Harvard, Mass.—V,AD  
Schwien Eng'g. Co., 16217 Lindbergh St., Van Nuys, Calif.—AE  
Scientific Specialties Corp., Snow & Union Sts., Brighton 35, Mass.—AJ  
Sessions Clock Co., Forestville, Conn.—AG  
Scott Inc., H. H., 385 Putnam Ave., Cambridge 39, Mass.—AB  
Servo Corp. of America, 2020 Jericho Tpke., New Hyde Park, L.I., N.Y.—Y  
Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y.—Y  
Servo-Tek Products Co., 1086 Goffe Rd., Hawthorne, N.J.—A  
SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—AK  
Shoup Eng'g. Co., 221 E. Cullerton St., Chicago 16, Ill.—W,AD  
Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—V,AD  
Simmonds Aerocessories, 105 White Plains Rd., Tarrytown, N.Y.—H,M  
Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—A,X,AF  
Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—  
Sperry Products Inc., Shelter Rock Rd., Danbury, Conn.—N  
Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—Y  
Standard Electric Time Co., 119 Logan St., Springfield, Mass.—I,AG  
Standard Electronic Research Corp., 2 East End Ave., New York 21, N.Y.—F,N,AF  
Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—B,I,U  
Statham Labs., 12401 W. Olympic Blvd., Los Angeles, Calif.—V  
Stewart Instrument Co., 6507 Grand River, Detroit 8, Mich.—V  
Strandberg Eng'g. Labs., 416 W. Market St., Greensboro, N.C.—O

Streeter-Amet Co., 4101 Ravenswood Ave., Chicago 13, Ill.—H,M,R,V,Y,AD,AF,AG,AH,AK,AL  
 Sturtevant Co., P. A., Addison, Ill.—AH,AI  
 Taco West Corp., 525 W. Noble St., Chicago 22, Ill.—AF  
 Technical Operations Inc., 6 Schouler Court, Arlington, Mass.—W  
 TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—AE  
 Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—V,W  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—E,F,K,M,N,AA  
 Telrex, Inc., Neptune Hwy., Asbury Park, N.J.—A  
 Tempil Corp., 11 W. 25 St., New York 11, N.Y.—AF  
 Thermo Electric Mfg. Co., 465 Huff St., Dubuque, Iowa.—AF  
 Thermo Instru. Co., P. O. Box 336, Belmont, Calif.—K,M  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—S,AG  
 Torngren Co., C. W., 236 Pearl St., Somerville, Mass.—A  
 Torsion Balance Co., Monhegan St., Clifton, N.J.—AC,AL  
 Tracerlab, Inc., 130 High St., Boston 10, Mass.—M,N,W,AK,AL  
 Transicoil Corp., 107 Grand St., New York 13, N.Y.—Y  
 Trans-Sonics Inc., Bedford Airport, Bedford, Mass.—V,AD,AE,AF  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—I,N,P,T,Y,AB,AE  
 United Electric Controls Co., 85 School St., Watertown 75, Mass.—AF  
 United States Gauge, Div. American Machine & Metals Inc., Clymer Ave., Sellersville, Pa.—H,M,Q,V,AE,AF,AH,AJ  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—AJ  
 Vapor Recovery Systems Co., 2820 N. Alameda St., Compton, Calif.—M  
 VECTOR, INC., 400 Main St., Waltham 54, Mass.—X,Y  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—W  
 Victory Engineering Corp., Springfield Rd., Union, N.J.—M,Q  
 Vitro Corp. of America, 233 Broadway, New York 7, N.Y.—H  
 Wakmann Watch Co., 15 W. 47 St., New York 36, N.Y.—AG  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—I  
 Weksler Thermometer Corp., 49 W. 32 St., New York 1, N.Y.—K,V,AF,AJ  
 Welch Mfg. Co., W. H., 1515 Sedgwick St., Chicago 10, Ill.—C,R,S,AF,AJ  
 Weltronic Co., 19500 W. 8 Mile Rd., Detroit 19, Mich.—AG  
 Westberg Mfg. Co., 144 S. Coombs St., Napa, Calif.  
 Western Electronic Enterprises, 3348 W. Compton Blvd., Gardena, Calif.—AJ  
 Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—W  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—I,K,L,S,U  
 White & Sons, Inc., Wilfrid O., 178 Atlantic Ave., Boston 10, Mass.—P  
 Whittington Pump & Eng'g. Corp., 1126 Prospect St., Indianapolis, Ind.—AJ  
 Wickes Eng'g. & Construction Co., 12th St. & Ferry Ave., Camden 4, N.J.—AG  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—J,K,R,S,AF  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio—Y  
 Wilson & Co., G. C., 2 N. Passaic Ave., Chatham, N.J.—AG  
 Wood Co., Ash M., 11938 E. Garvey Blvd., P.O. Box 150, El Monte, Calif.—AB  
 Worner Electronic Devices, Rankin, Ill.—AA  
 Yellow Springs Instrument Co., P. O. Box 106, Yellow Springs, Ohio—E

## 34—INDUSTRIAL ELECTRONIC EQUIPMENT

Cookers, electronic ..... A  
 Cyclotrons ..... B  
 Dehydrators ..... C  
 Dielectric heating equipment ..... D  
 Electric furnaces ..... E  
 Electron microscopes ..... F  
 Electronic photoflash ..... G  
 Electroplating equipment ..... H  
 Geophysical instruments ..... I  
 Heating elements ..... J  
 Induction heating equipment ..... K  
 Infrared drying equipment ..... L  
 Ionization chambers ..... M  
 Irradiators ..... N  
 Metal flaw locators ..... O  
 Meteorological equipment ..... X  
 Nuclear equipment ..... P  
 Photographic x-ray equipment ..... Q  
 Spectrographic equipment ..... R  
 Titration apparatus ..... S  
 X-ray diffraction equipment ..... T  
 X-ray filters ..... U  
 X-ray inspection machines ..... V  
 X-ray screens ..... W

Accurate Eng'g. Co., 2005 Blue Island Ave., Chicago 8, Ill.—H  
 Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N.Y.—J  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—I,O  
 American Optical Co., Box A, Buffalo 15, N.Y.—R  
 Amglo Corp., 2037 W. Division St., Chicago 22, Ill.—G  
 Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y.—R,T  
 ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—C  
 Applied Physics Corp., 362 W. Colo. St., Pasadena 1, Calif.—M,R  
 A.R.F. Products 7627 Lake St., River Forest, Ill.—N  
 Atlas Coil Winders Inc., 39 Manhattan St., Stamford, Conn.—U  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—M,P  
 Atomlab, Inc., 489 5 Ave., New York 17, N.Y.—P  
 Austin Co., 76 9 Ave., New York 11, N.Y.—P  
 Baird Associates Inc., 33 University Rd., Cambridge, Mass.—R  
 Barber-Colman Co., 1300 Rock St., Rockford, Ill.—A  
 Bar-Ray Products Inc., 209 25 St., Brooklyn 32, N.Y.—L,M,Q  
 Bausch & Lomb Optical Co., 628 St. Paul St., Rochester, N.Y.—R  
 Beckman & Whiteley, 985 San Carlos Ave., San Carlos, Calif.—R,X  
 Bendix Aviation Corp., Cincinnati Div., 203 W. 3 St., Cincinnati 2, Ohio—P  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS INC., 2200 Wright Ave., Richmond, Calif.—P  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—B,F,P  
 Borden Eng'g. 63 Clinton Ave., New Providence, R.I.—I  
 Bowen & Co., 4712 Bethesda Ave., Bethesda Md.—I  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—G,P  
 Bracke-Seib X-Ray Co., 293 3 Ave., New York 10, N.Y.—T,V  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—I  
 Calbest Eng'g. & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—J  
 Cambridge Instrument Co., Grand Central Terminal, New York 17, N.Y.—I,M  
 Cast Optics Corp., 1010 Post Rd., Riverside, Conn.—U  
 Central Research Labs. Inc., Red Wing, Minn.—P,T  
 CENTURY ELECTRONICS, 14806 Oxnard St., Van Nuys, Calif.—N  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—I,O  
 Central Scientific Co., 1700 W. Irving Park Rd., Chicago, Ill.—E,R,S  
 Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—K,N,P  
 Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—P  
 Columbia Resistors Inc., 216 Lafayette St., New York 12, N.Y.—J  
 Consolidated Vacuum Corp., 735 Ridge Rd., W., Rochester 3, N.Y.—P  
 Cox & Co., 115 E. 23 St., New York, N.Y.—J  
 Dage Electronics Corp., 69 N. 2 St., Beech Grove, Ind.  
 Dallons Labs., 5066 Santa Monica Blvd., Los Angeles 29, Calif.  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—L,R,Q

Diatron Co., 3327 Dixie Dr., Houston 21, Tex.—D,I,K  
 Dice Co., J. W., 1 Engle St., Englewood, N.J.—O  
 Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—P  
 Dormitzer Electric & Mfg. Co., 5 Hadley St., Cambridge 40, Mass.—G  
 DuPont De Nemours & Co., E. I., 10 & Market St., Wilmington 98, Del.—U,W  
 Eagle Electric Mfg. Co., 23-10 Bridge Plaza S., Long Island City, N.Y.—J  
 Edin Co., 207 Main St., Worcester 8, Mass.—I  
 Egan, Lab., 107-56 113 St., Richmond Hill 19, N.Y.—P  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—D  
 Electric Furnace Co., Wilson St., & Penna R.R., Salem, Ohio—E  
 Electrofilm Corp., 7116 Laurel Canyon Blvd., N. Hollywood, Calif.—J  
 Electronic Eng'g. Co., 362 W. Bowery St., Akron 7, Ohio  
 Electronic Heating Corp., 66 Needham St., Newton Highlands 61, Mass.—D,K  
 Electronic Research Co., 11550 39 N.E., Seattle 55, Wash.—J,L  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—E,H,J  
 Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.—G  
 El-Tronics Inc., 5 & Noble Sts., Philadelphia 23, Pa.—M,P,S  
 Eng'g. Res'ch. & Devel. Co., Addison, Ill.—D  
 Eng'g. Research Associates, Div. Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—I  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—D,K,P  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—D,K,P  
 Eureka X-Ray Tube Corp., 3250 N. Kilpatrick Ave., Chicago 41, Ill.  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—P  
 Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.—I  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—G,M,P  
 GALBRAITH & SONS, 450 6 Ave., New York 11, N.Y.—J  
 Gamewell Co., Newton Upper Falls 64, Mass.  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B,D,E,G,J,K,R  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—P  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—P  
 Georator Corp., Manassas, Va.—I,M  
 Geotronics Labs., 1314 Cedar Hill Ave., Dallas 11, Tex.—I  
 GULTON MFG. CORP., Metuchen, N.J.—O  
 Gurley, W. & L. E., 514 Fulton St., Troy, N.Y.—I,R,X  
 Harper Electric Furnace Corp., 39 River St., Buffalo 2, N.Y.—E  
 Harwood Mfg. Co., 466 W. Superior St., Chicago 10, Ill.—G  
 Haydu Bros., Box 1226, Plainfield, N.J.—D,K  
 Heiland Research Corp., 130 E. 5 Ave., Denver 9, Colo.—G,I  
 Huggins Labs., 700 Hamilton Ave., Menlo Park, Calif.—G  
 Huppert Co., K. H., 6830 Cottage Grove Ave., Chicago 37, Ill.—E,J  
 Industrial Electronic Eng'rs., 3973 Lankershim Blvd., N. Hollywood, Calif.—D  
 Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus 12, Ohio—P  
 Inet, Inc., 8655 S. Main St., Los Angeles 3, Calif.—H  
 International Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—I  
 Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass.—I,L,R,T  
 Kaye-Halbert Corp., 3623 Eastham Dr., Culver City, Calif.  
 Kocour Co., 3504 W. 48 Pl., Chicago 32, Ill.—H  
 Las-Lab, 316 W. Saratoga St., Baltimore 1, Md.—G  
 Lee Electric & Mfg. Co., 2806 Clearwater St., Los Angeles 39, Calif.—H  
 Leitz, Inc., 468 4 Ave., New York 16, N.Y.—F  
 Lepel High Frequency Labs., 54-18 37 Ave., Woodside 77, L.I., N.Y.—K  
 Lovins Eng'g. Corp., 8203 Cedar St., Silver Springs, Md.—T  
 Lyseo Mfg. Co., 1401 Clinton, Hoboken, N.J.—H  
 MacDonald Co., W. S., 33 University Rd., Cambridge 38, Mass.—P  
 Mackay Inc., A. D., 198 Broadway, New York 38, N.Y.—P,U  
 Magnaflex Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.—O  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—P,U  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—H  
 Manson Labs., 207 Greenwich Ave., Stamford, Conn.—P,R  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—P  
 Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—K  
 Massa Labs., 5 Pottler Rd., Hingham, Mass.  
 Menlo Research Lab., P. O. Box 522, Menlo Park, Calif.—N,P  
 MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass.—I

## LOCALIZER INDEX

## FINDER

Manufacturers using the LOCALIZER INDEX are listed alphabetically. The LOCALIZER INDEX—an exclusive feature of the 1953 ELECTRONIC INDUSTRIES DIRECTORY—lists local "reps" and branch offices (names, addresses, telephone numbers, territory covered), home telephone numbers, executive personnel, trade names.

**TELE-TECH**  
 & ELECTRONIC INDUSTRIES

# ELECTRONIC INDUSTRIES DIRECTORY

Midwestern Geophysical Lab., 3401 S. Harvard, Tulsa, Okla.—I  
 Miskella Infra-Red Co., E. 73 & Grand Ave., Cleveland 4, Ohio—J,L  
 National Research Corp., Equip. Div., 70 Memorial Dr., Cambridge 42, Mass.—E  
 National Spectrographic Labs. Inc., 6300 Euclid Ave., Cleveland 3, Ohio—R  
 Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N.J.—W  
 North American Philips Co., 750 S. Fulton Ave., Mt. Vernon, N.Y.—F,T  
 Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.—M,P,AA  
 Nuclear Measurements, 2460 N. Arlington Ave., Indianapolis 18, Ind.—P  
 Nuclear Research Corp., 2563 Grays Ferry Ave., Philadelphia 46, Pa.—P  
 Nuclear Research & Devel. Co., 6425 Etzel Ave., St. Louis 14, Mo.—M,P,AA  
 Nucleonic Co. of America, 497 Union St., Brooklyn 31, N.Y.—M,P  
 Offner Electronics Inc., 5320 N. Kedzie Ave., Chicago 25, Ill.—I  
 Ohmart Corp., 2347 Ferguson Rd., Cincinnati 38, Ohio—M,P,AA  
 Opad-Green Co., 71 Warren St., New York 7, N.Y.—H  
 Orthon Corp., 196 Albion Ave., Paterson N.J.—L,W  
 Patwin Instruments Div., Patent Button Co., 41 Brown St., Waterbury 20, Conn.—X  
 Peeco Corp., 2760 Whittier Blvd., Los Angeles 23, Calif.—D  
 Pereny Equipment Co., 893 Chambers Rd., Columbus 12, Ohio—E,J  
 Peschel Electronics, 13 Garden St., New Rochelle, N.Y.—D,K  
 Phila. Scientific Glass Co., 4 Eckard Ave., Abington, Pa.—I  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—W,AA  
 Photobell Co., 116 Nassau St., New York 38, N.Y.—G  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—R  
 Precision Radiation Instruments, 2235 S. La Brea, Los Angeles 16, Calif.—I,P  
 Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.—S  
 Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N.Y.—S  
 Radioactive Products Inc., 443 W. Congress, Detroit 26, Mich.—M,P  
 Radiation Counter Labs., 5122 W. Grove St., Skokie, Ill.—M,P  
 Rapid Electroplating Process, Inc., 1414 S. Wabash Ave., Chicago 5, Ill.—H  
 RAYTHEON MFG. CO., Waltham 54, Mass.—A  
 Reeder & Co., C. M., 171 Victor Ave., Detroit 3 Mich.—R  
 Reeve Electronics Inc., 609 W. Lake St., Chicago 6, Ill.—D,K  
 Regulator Eng'g. & Devel. Co., 11545 W. Jefferson Blvd., Culver City, Calif.—H  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—D,I,K,O,P  
 Research Electronics Labs., Roslyn, Pa.—G  
 Richardson Labs., Kenneth, 254 Vincent Ave., Lynbrook, N.Y.—D  
 Ruska Instrument Corp., 4607 Montrose Blvd., Houston 6, Tex.—I  
 Sanders Associates, 137 Canal St., Nashua, N.H.—R  
 Shannon Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 46, Calif.—L,O  
 Sherman Industrial Electronics Co., 5050 Washington Ave., Belleville, N.J.—D,J,K  
 Seismograph Service Corp., P. O. Box 1590, Tulsa, Okla.—I  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—A  
 Southwestern Industrial Electronics, 2831 Post Oak Rd., Houston, Tex.—I,S  
 Sperry Products, Shelter Rock Rd., Danbury, Conn.—O  
 Standard Electronic Research Corp., 2 East End Ave., New York 21, N.Y.—V  
 Sta-Warm Electric Co., 553 N. Chestnut St., Ravenna, Ohio—D  
 Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—Q  
 Technical Operations Inc., 6 Schouler Court, Arlington 74, Mass.—O,P,Q  
 Teletronics Lab., 54 Kinkel St., Westbury, L.I. N.Y.—K  
 Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—R  
 Thompson Clock Co., H.O., 38 Federal St., Bristol, Conn.—J,L,Q,W  
 Torngren Co., C. W., 236 Pearl St., Somerville, Mass.—P  
 Tracerlab, Inc., 130 High St., Boston 10, Mass.—M,P,W  
 Triplett & Barton, P. O. Box 3128, Burbank, Calif.  
 Triumph Mfg. Co., 913 W. Van Buren, Chicago 7, Ill.—G  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—O  
 U. S. Radium Corp., 535 Pearl St., New York 7, N.Y.—W  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—M,P,AA  
 Victory Eng'g. Corp., Springfield Rd., Union, N.J.—P  
 Vulcan Electric Co., 88 Holten St., Danvers, Mass.—J  
 WALL MFG. CO., P., Erie St., Grove City, Pa.—J

Wang Labs., 296 Columbus Ave., Boston 16, Mass.—P  
 Welsh Electric Co., 1221 Wade St., Cincinnati 14, Ohio—AA  
 Weltronic Co., 19500 W. 8 Mile Rd., Detroit 19, Mich.—D,K  
 Westberg Mfg. Co., 144 S. Coombs St., Napa, Calif.  
 Western Gold & Platinum Works, 589 Bryant St., San Francisco 7, Calif.—E,J  
 Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—M,P,W,AA  
 WESTINGHOUSE ELECTRIC CORP., 2519 Wilkens Ave., Baltimore 3, Md.—D,K  
 Wilcox Research Corp., 340 N. LaBrea Ave., Los Angeles 36, Calif.—G  
 Wood Counter Lab., N., 5491 Blackstone Ave., Chicago 15, Ill.—P  
 Woodwelding, Inc., 3000 W. Olive Ave., Burbank, Calif.—D,K

## 35—INSULATION MATERIALS & COMPOUNDS

Alundum grain	A
Asbestos	B
Asphalt	C
Capacitor papers	D
Coil tape	E
Fabric	F
Fiber	G
Fiber glass	H
Friction tape	I
Insulating coatings	J
Liners, can	K
Paper	L
Plastics	M
Rubber	N
Silicon	O
Steatite	P
Synthetic resin	Q
Varnished fabric	R

Acme Folding Box Co., 149 E. 25th St., New York 10, N.Y.—K,L  
 Advanced Vacuum Products, 22 Liberty St., Stamford, Conn.—P  
 Air Associates Inc., 1231 Airway, Glendale 1, Calif.—B,I  
 Akron Rubber Co., 53 Warren St., New York 7, N.Y.—G,H,M,N,O  
 Allied Asphalt & Mineral Corp., 217 Broadway, N.Y., N.Y.—C,M  
 AMERICAN LAVA CORP., Chattanooga 5, Tenn.—C,P  
 American Wood Working Co., 1688 N. Lowell Ave., Chicago 39, Ill.—H  
 Auburn Mfg. Co., Pease Ave. & Stack St., Middletown, Conn.—B,E,G,L,M,N,O,R  
 Baer Co., N.S., 1 Montgomery St., Hillside 5, N.J.—G,H,M  
 Bakelite Co., Div. Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N.Y.—M,Q  
 Bentley-Harris Mfg. Co., Conshohocken, Pa.—H  
 Biggs Co., Carl H., 2255 Barry Ave., Los Angeles 64, Calif.—J,M  
 Birnbach Radio Co., 145 Hudson St., New York 13, N.Y.—P  
 Bishop Mfg. Corp., 10 Canfield Rd., Cedar Grove, N.J.—F,H,N  
 Biwax Corp., 3445 Howard St., Skokie, Ill.—C  
 Borthig Co., George C., P. O. Box 115 E. Rutherford, N.J.—C  
 Boruski Jr., Ernest F., 162 W. 54 St., New York 19, N.Y.—M,Q  
 Bram Chemical Co., 820 65 Ave., Philadelphia 26, Pa.—O,P,Q  
 BRAND & CO., WM., North & Valley Sts., Willimantic, Conn.—B,E,F,H,L,O,R  
 Brooks Radio & Television Corp., 84 Vesey St., New York 7, N.Y.—M  
 Cast Optics Corp., 1010 Post Rd., Riverside, Conn.—M  
 Celanese Corp. of America, 180 Madison Ave., New York 16, N.Y.—M  
 CENTRALAB, DIV., GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wisc.—P  
 Chester-Morton Electronics Corp., 10 St. & Morton Ave., Chester, Pa.—N  
 Citation Products Co., 233 E. 146 St., New York 51, N.Y.—G,M  
 Conn. Hard Rubber Co., 407 East St., New Haven 9, Conn.—F,N,O  
 Continental-Diamond Fibre Co., Newark, Del.—E,F,G,H,L,M,O,Q  
 Continental Textile & Supply, 4245 W. Armitage Ave., Chicago 39, Ill.—F,M,N,R  
 Decatur Electronic Industries Corp., 1620 Decatur St., Brooklyn 27, N.Y.—N  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—A,N

Dialetric Materials Co., 5315 N. Ravenswood Ave., Chicago 40, Ill.—H  
 Dow Corning Corp., P. O. Box 592, Midland, Mich.—O,Q  
 Du-Co Ceramics Co., Box 587, Butler, Pa.—C,D,P  
 Durex Plastics & Chemicals, 1926 Walck Rd., N. Tonawanda, N.Y.—M,Q  
 Dynakon Corp., 9623 Clinton, Cleveland, Ohio—H,M  
 Electrofilm Corp., 7116 Laurel Canyon Blvd., N. Hollywood, Calif.—J  
 Electronic Mechanics, Inc., 101 Clifton Blvd., Clifton, N.J.—M  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—B,E,H,I,L,O,R  
 Electro Technical Products, Div. Sun Chemical Corp., 113 E. Centre St., Nutley 10, N.J.—B,E,F,H,J,K,L,O,R  
 Emeloid Co., 1239 Central, Hillside, N.J.—M  
 Emerson & Cuming, 869 Washington St., Canton, Mass.—J,M  
 FORMICA CO., 4644 Spring Grove Ave., Cincinnati 32, Ohio—M,O  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—I,J,L,M,R  
 GENERAL CERAMICS & STEATITE CORP., Crows Mill Rd., Keasbey, N.J.—I,P  
 GENERAL ELECTRIC CO., CHEMICAL DIV., 1 Plastics Ave., Pittsfield, Mass.—J,M,N,O,Q,R  
 Glass Fibers Inc., 1810 Madison Ave., Toledo 2, Ohio—H  
 Goodrich Chemical Co., 2060 E. 9 St., Cleveland 15, Ohio—N  
 Haydon Products Corp., 1801 Eighth Ave., Brooklyn 15, N.Y.—H  
 HEMINWAY & BARTLETT MFG. CO., 500 5 Ave., New York 36, N.Y.—E  
 HERMETIC SEAL PRODUCTS CO., 33 S. 6 St., Newark 7, N.J.  
 Houghton Labs., Inc., 322 Bush St., Olean, N.Y.—J,M  
 Industrial Tape Corp., New Brunswick, N.J.—I  
 Insulating Fabricators of New England, 69 Grove St., Watertown 72, Mass.—G,M  
 Insulating Tube Co., 26 Cottage St., Poughkeepsie, N.Y.—M  
 Insulation Mfrs. Corp., 565 W. Washington Blvd., Chicago 6, Ill.—B,E,F,G,H,I,J,L,M,R  
 Irvington Varnish & Insulator, 6 Argyle Terr., Irvington 11, N.J.—B,F,I,J,L,M,N,O,R  
 Isolantite Mfg. Co., Warren Ave., Stirling, N.J.—D,O  
 Javex, Box 646, Redlands, Calif.—J  
 Johns-Manville, Box 60, New York, N.Y.—B  
 JOHNSON CO., E. F., Waseca, Minn.—P  
 Keasbey & Mattison Co., Ambler, Pa.—B  
 Keller Products, Inc., 41 Union St., Manchester, N.H.—H  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—G,M  
 Kirchberger & Co., M., 1425 37 St., Brooklyn 18, N.Y.—M,P  
 Laidman & Co., 1308 N. Halstead St., Chicago 22, Ill.—B,G,L,N  
 Lapp Insulator Co., 27 Gilbert St., LeRoy, N.Y.—P  
 Linde Air Products Co., Div. Union Carbide & Carbon Co., 30 E. 42 St., New York 17, N.Y.—O  
 Linick Chemical Co., 59 E. Madison St., Chicago 3, Ill.—C  
 Louthan Mfg. Co., P. O. Box 86, E. Liverpool, Ohio—P  
 Lynn Electronic Research Co., 9 W. Magnolia Blvd., Burbank, Calif.—H,M  
 Mackay Inc., A.D., 198 Broadway, New York 38, N.Y.—O  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—D,M  
 Manning Paper Co., John A., P. O. Box 328, Troy, N.Y.—L  
 Mark Products Co., 3547 Montrose Ave., Chicago 18, Ill.—H  
 Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—R,H,L  
 Mica Fabricating Co., 53 Central Ave., Rochelle Park, N.J.—B,G,H,R  
 Micro-Circuits Co., New Buffalo, Mich.—Q  
 Minerals & Insulation Co., 55 Central Ave., Rochelle Park, N.J.—B,G,H,R  
 Minn. Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.—E,F,G,H,L,M,N,Q  
 Minn. Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis 16, Minn.—N,O  
 Mitchell Rand Companies, 51 Murray, New York 7, N.Y.—B,C,E,F,H,I,J,L,M,N,O,Q,R  
 Moore Co., Howard Jr., 266 William St., New York, N.Y.—A,D,F,G,H,K,L,M,N,O,R  
 Mosinee Paper Mills, Mosinee, Wisc.—H,L  
 Mykroy Inc., Wheeling & Hintz Rds., Wheeling, Ill.—M  
 National Gasket & Washer Mfg. Co., 124 E. 25 St., New York 10, N.Y.—B,D,G,L,M,N,O,Q  
 National Vulcanized Fibre Co., Maryland Ave. & Beech St., Wilmington 99, Del.—F,G,H,M,O  
 Natvar Corp., 211 Randolph Ave., Woodbridge, N.J.—D,E,H,J,L,M,O,R  
 Neo-Sil Corp., 26 Cornelson Ave., Jersey City 4, N.J.—M,N  
 Norton Co., 1 New Bond St., Worcester 6, Mass.—A  
 Owens-Corning Fiberglass Corp., 16 E. 56 St., New York 22, N.Y.—H  
 Paramount Paper Tube Co., 616 Lafayette St., Ft. Wayne, Ind.—L



Penn Fibre & Specialty Co., 2030 E. Westmoreland St., Philadelphia 34, Pa.—G,L,M  
 Plasticraft Products Co., 1 Station Plaza, West Nyack, N.Y.—M,O  
 Polymer Corp., of Pa., 126 N. 5 St., Reading, Pa.—M  
 PRECISION PAPER TUBE CO., 2035 W. Charleston St., Chicago 47, Ill.—K,L  
 Rex Corp., 66 Lansdowne St., Cambridge 39, Mass.—L  
 Richardson Co., Lockland, Cincinnati 15, Ohio—M  
 Resistoflex Corp., 39 Planson St., Belleville 9, N.J.—M  
 Rex Corp., Hayward Rd., W. Acton, Mass.—M  
 Rogan Bros., 8031 N. Monticello, Skokie, Ill.—M  
 Rogers Corp., Goodyear, Conn.—B,D,G,H,K,L,M,Q  
 Rollon Rubber Products, 1805 Jerome Ave., Bronx 53, N.Y.—N,O  
 St. Regis Paper Co., Panelyte Div., 230 Park Ave., New York, N.Y.—M  
 Sauereisen Cements Co., 1045 N. Canal St., Pittsburgh 15, Pa.—J  
 Saxenburg Potteries, Saxenburg, Pa.—P  
 Solar Mfg. Corp., 2660 E. 46 St., Los Angeles 58, Calif.—P  
 Spaulding Fibre Co., 310 Wheeler St., Tonawanda, N.Y.—G,K,M  
 Star Porcelain Co., Muirhead Ave., Trenton 9, N.J.—P  
 Stevens Products, 86 Main St., E. Orange, N.J.—F,H,L,O,R  
 STEWARD MFG. CO. 3608 Jerome Ave., Chattanooga, Tenn.—P  
 Stone City, P. O. Box 351, Bedford, Ind.—K  
 Stone Paper Tube Co., Washington 17, D.C.—K,L,O  
 Stratoseal Mfg. Co., 3039 W. Fullerton Ave Chicago 47, Ill.—O  
 Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.  
 Taylor Fibre Co., Norristown, Pa.—G,M  
 Thompson Co., H. I., 1733 Cordova St., Los Angeles 7, Calif.—H  
 Thor Ceramics, Inc., 225 Belleville Ave., Bloomfield, N.J.—P  
 U. S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—K  
 Varflex Corp., 305 N. Jay St., Rome, N.Y.—F,H,M,O,Q,R  
 Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.—G,L,M  
 Wright & Sons Co., Wm. E., South St., W. Warren, Mass.—E

American Wood Working Co., 1682 N. Lowell Ave., Chicago 39, Ill.  
 Argyle Electronics Co., 8 W. 18 St., New York 11, N.Y.—J  
 Asheville Schoonmaker Mica Co., Box 318, Newport News, Va.—E,H  
 Bentley, Harris Mfg. Co., Hector & Lime Sts., Conshohocken, Pa.—N,P  
 Bird & Co., Richard H., 1 Spruce St., Waltham 54, Mass.  
 Birnbach Radio Co., 145 Hudson St., New York 13, N.Y.—A,C,D,J,K  
 Blaco Mfg. Co., 6541 Euclid Ave., Cleveland 3, Ohio—J  
 Blazon Mfg., 6021 Dempster St., Morton Grove, Ill.  
 BRAND & CO., WM., North & Valley Sts., Willimantic, Conn.—E,H,I,N  
 Brillhart Plastic Corp., Box 31, Old Country Rd., Mineola, L.I., N.Y.—I,J  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—A,C,J,K  
 Brooks Radio & Television Corp., 84 Vesey St., New York 7, N.Y.—I  
 Cambridge Thermionic Corp., 445 Concord Ave., Cambridge 38, Mass.—J  
 Camburn Sales & Mfg. Corp., P. O. Box 408, Battle Creek, Mich.—J  
 CENTRALAB, Div., Globe-Union Inc., 900 E. Keefe Ave., Milwaukee 1, Wisc.—A,B,C,G,I,J,M  
 Citation Products Co., 233 E. 146 St., New York 51, N.Y.—J  
 Clearbeam TV Antenna Co., 100 Prospect Ave., Burbank, Calif.—A  
 CLEVELAND CONTAINER CO., 6201 Barber-ton Ave., Cleveland 2, Ohio—O,P  
 Continental Diamond Fibre Co., Newark, Del.—E,H,I,O,P,Q  
 Corning Glass Works, P. O. Box 544, Corning, N.Y.—G,J,N  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—C,E  
 Dialectic Materials Co., 5315 N. Ravenswood Ave., Chicago 40, Ill.—I,P  
 Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.—Q  
 Du-Co Ceramics Co., Box 587, Butler, Pa.—B,C,D,I,J,L,M  
 Dynakon, 9623 Clinton, Cleveland, Ohio—A  
 EBY INC., HUGH H., 4700 Stenton Ave., Philadelphia 44, Pa.—J  
 Electronic Mechanics, Inc., 101 Clifton Blvd., Clifton, N.J.—A,B,E,J  
 Electro-Tech Equip Co., 308 Canal St., New York, N.Y.—H,K,L,P  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,B,C,G,I,J,L,N,P  
 Frenchtown Porcelain Co., 8th & Harrison Sts., Frenchtown, N.J.—C  
 Fretco, Inc., 1041 Forbes St., Pittsburgh 19, Pa.—A  
 GARDE MFG. CO., 588 Eddy St., Providence 3, R.I.—J  
 Gee-Lar Mfg. Co., 1330 10 Ave., Rockford, Ill.—A,J  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—A,J,P  
 GENERAL CERAMICS & STEATITE CORP., Crows Mill Rd., Keasbey, N.J.—B,C,G,J,L  
 General Electric Co., Chemical Div., 1 Plastics Ave., Pittsfield, Mass.—E,H,I  
 Grayhill, 561 Hillgrove Ave., La Grange, Ill.—J,K  
 Haydon Products Corp., 1801 8 Ave., Brooklyn 15, N.Y.—A,J  
 HERMETIC SEAL PRODUCTS CO., 33 S. 6 St., Newark 7, N.J.  
 Hermetite Corp., 702 Beacon St., Boston 15, Mass.—B,C,I,J  
 Illinois Electric Porcelain Co., 510 N. Pearl St., Macomb, Ill.—A,C,I,J  
 Imperial Radar & Wire Corp., 4342 Bronx Blvd., New York 66, N.Y.—A  
 Industrial Devices, Edgewater, N.J.—J,K  
 Insulating Fabricators of New England, Inc., 69 Grove St., Watertown 72, Mass.—N,P  
 Insulation Mfrs. Corp., 565 W. Washington Blvd., Chicago 6, Ill.—H,I,P  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—A,C,J  
 Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N. J.—N,O,P  
 Isolantite Mfg. Corp., Warren Ave., Stirling, N.J.—A,B,C,G,J,L  
 Javex, Box 646 Redlands, Calif.—F  
 J F D Mfg. Co., 6101-16 Ave., Brooklyn 4, N. Y.—A  
 JOHNSON CO., E. F., Waseca, Minn.—A,C  
 Kaywoff Products Co., Overton, Nebr.—K  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—K  
 Kirchberger & Co., M., 1425-37 St., Brooklyn 18, N.Y.—B,C,L  
 Laidman & Co., 1308 N. Halstead St., Chicago 22, Ill.—Q  
 Lapp Insulator Co., 27 Gilbert St., Leroy, N.Y.—A,C,F,J,M  
 Locke Dept., of General Electric Co., P.O. Box 57, Baltimore 3, Md.—A,F,G,J  
 Louthan Mfg. Co., P. O. Box 86, E. Liverpool, Ohio—C  
 Lynn Electronic Research Co., 9 W. Magnolia, Burbank, Calif.—J  
 Mansol Ceramics Co., 13 Valley St., Belleville, N.J.—B,C

Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—A  
 Mica Fabricating Co., 53 Central Ave., Rochelle Park, N.J.—E,H  
 Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—H,O,P  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—A,C,J  
 Minerals & Insulation Co., 55 Central Ave., Rochelle Park, N.J.—E,H  
 Minn. Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis 16, Minn.—I  
 Mitchell Rand Companies, 51 Murray St., New York 7, N.Y.—E,H,N,O,P  
 Moore Co., Howard J., 266 Williams St., New York, N.Y.—I,O,P  
 Mosley Electronics, 8622 St. Charles Rock Rd., St. Louis 14, Mo.—A  
 Mueller Electric Co., 1583 E. 31 St., Cleveland 14, Ohio—J,K  
 MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—C,E,H,J  
 Mykroy, Inc., Wheeling & Hintz Rds., Wheeling, Ill.—A,C,E,J  
 National Co., 61 Sherman St., Malden 48, Mass.—A,C,J  
 National Electric Products Co., 338 14 St., Ambridge, Pa.—A,F  
 National Electronic Mfg. Corp., 42-08 Vernon Blvd., Long Island City 1, N.Y.—A  
 Natvar Corp., 211 Randolph Ave., Woodbridge, N.J.—I,P  
 Neo-Sil Corp., 26 Cornelison Ave., Jersey City 4, N.J.—Q  
 Paramount Paper Tube Corp., 614 S. Lafayette St., Ft. Wayne 2, Ind.—O  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—A  
 PLASTOID CORP., 42-61 24 St., Long Island City 1, N.Y.—J  
 Polymer Corp. of Pa., 126 N. 5 St., Reading, Pa.—B,I,Q  
 PRECISION PAPER TUBE CO., 2035 W. Charleston St., Chicago 47, Ill.—O  
 Radiart Corp., 3455 Vega Ave., Cleveland 13, Ohio—A,J  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—A,K,J  
 Richards Co., Arklay St., 37 Winchester St., Newton Highlands 61, Mass.  
 Saxenburg Potteries, Saxenburg, Pa.—B,C,I,J,L  
 Schneider & Marquard, 199 S. Portland Ave., Brooklyn, N.Y.—H  
 Schuttig & Co., 9 & Kearny St., N.E. Washington 17, D.C.—C  
 Sealelectro Corp., 186 Union Ave., New Rochelle, N.Y.—J  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—B,C,G,J  
 Smith, Inc., Herman H., 436-18 St., Brooklyn 15, N.Y.—J,K  
 Solar Mfg. Corp., 2660 E. 46 St., Los Angeles 58, Calif.—C  
 Spaulding Fibre Co., 310 Wheeler St., Tonawanda, N.Y.—Q  
 Spruce Pine Mica Co., Spruce Pine, N.C.—H  
 Star Porcelain Co., Muirhead Ave., Trenton 9, N.J.—B,C  
 STEWARD MFG. CO., D.M., E. 36th St., Chattanooga, Tenn.—B,C,G,J,L  
 Stone Paper Tube Co., 900 Franklin St., N.E., Washington 17, D.C.—O  
 Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.  
 Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.—C,G,J  
 SYLVANIA ELECTRIC PRODUCTS, 1740, Broadway, New York 19, N.Y.—H  
 Syncor Products Co., 26 Irving Court, Malden 48, Mass.—A,B,C,I,J  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,C,D,E,H,I,J  
 Telex, Inc., 1633 Eustis, St. Paul, Minn.—Q  
 Thomas & Sons Co., R., Lisbon, Ohio—A,B,C,J,L  
 Thompson, Co., H.I., 1733 Cordova St., Los Angeles 7, Calif.—I  
 THOR CERAMICS, INC., 225 Belleville Ave., Bloomfield, N.J.—A,B,C,G,I,J,M  
 Torwico Electronics, 967 Frelinghuysen Ave., Newark 5, N.J.—J  
 Trilsch Co., John D., 1310 McKinney Ave., Houston, Texas.—A,M  
 Ucinite Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.—J  
 U. S. Engineering Co., 521 Commercial St., Glendale 3, Calif.—J  
 U. S. Gasket Co., 602 N. 10 St., Camden 1, N.J.—A,J,M,Q  
 U. S. Tower Co., 219 Union Trust Bldg., Petersburg, Va.—M  
 Varflex Corp., 305 N. Jay St., Rome, N.Y.—I,L,N,P  
 Western Gold & Platinum Works, 589 Bryant St., San Francisco 7, Calif.—C  
 Whitso, Inc., 9330 Byron St., Schiller Park, Ill.—J  
 William & Co., Willimantic, Conn.—I  
 WINCHARGER CORP., E. 7 at Division St., Sioux City 2, Iowa—A,M  
 Winchester Electronics, Inc., 15 Crescent St., Glenbrook, Conn.—J  
 Wind Turbine Co., E. Market St. & Penn. R.R., West Chester, Pa.—A,J,M

### 36—INSULATORS

- Insulators, antenna ..... A
- Insulators, bead ..... B
- Insulators, bearings ..... Q
- Insulators, ceramic ..... C
- Insulators, cord ..... D
- Insulators, glass bonded mica .... E
- Insulators, H.V. power line ..... F
- Insulators, metallized bushing ... G
- Insulators, mica ..... H
- Insulators, sleeve ..... I
- Insulators, standoff ..... J
- Insulators, test clip ..... K
- Insulators, thermocouple ..... L
- Insulators, tower ..... M
- Insulators, tubing, glass ..... N
- Insulators, tubing, paper ..... O
- Insulators, tubing, varnish ..... P

ACCURATE PAPER TUBE CO., 805 N. Peoria St., Chicago 22, Ill.  
 Advanced Vacuum Products, 22 Liberty St., Stamford, Conn.—C,G,I,J  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—A,J,Q  
 Aeronautical Radio Mfg. Co., 155 1st St., Mineola, N.Y.—A,C,J  
 Air Associates Inc., 1231 Airway, Glendale 1, Calif.—A  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass.—J,K  
 Allied Allegri Machine Co., 141 River Rd., Nutley 10, N.J.—O,P  
 AMERICAN LAVA CORP., Chattanooga 5, Tenn.—A,B,C,I,J,L,M  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—A,J  
 American Radio Hardware Co., 152 MacQueston Parkway S., Mount Vernon, N.Y.—K

## 37—LIGHTING EQUIPMENT & ACCESSORIES

Accessories & supplies	A
Arc lights	B
Black lights	C
Consoles, control	D
Dial lights	E
Dimmers	F
Fluorescent lights	G
Fluorescent pigment	H
Gobos	I
Incandescent lights	J
Light Meters	L
Lighting preset panels	M
Photoelectric	N
Portable lighting kits	K
Power supplies	O
Signal lights	P
Stroboscope	Q
Studio rigging	R

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—F,O  
 Acorn Electronics Corp., Box 348, Gibson City, Ill.—O  
 Acromark Co., 9 Morrell St., Elizabeth 4, N.J.—E  
 Adams Lighting Inc., 48 W. 27 St., New York 1, N.Y.—G,J  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—A,E,F  
 Aerolux Light Corp., 653 Eleventh Ave., New York 36, N.Y.—A,C,K,P  
 Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J.—G  
 A.J.F. Industries, 852 Monroe St., Brooklyn 21, N.Y.—G  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—E  
 American Communications Corp., 306 Broadway, New York 7, N.Y.—C  
 American Radio Hardware Co., 152 MacQuesten Parkway S., Mount Vernon, N.Y.—E,F  
 ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—P  
 Art Specialty Co., 3245 W. Lake St., Chicago 24, Ill.—G,J,K  
 Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—O,Q  
 Barton Electronics, 955 Asylum Ave., Hartford 5, Conn.—N  
 Baughman Co., E. J., 350 S. Central, Los Angeles 13, Calif.—A,F,G,I,J,K,L,M,N  
 CAMERA EQUIPMENT CO., 1600 Broadway, New York 19, N.Y.—B,F,K,L,O,R  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—A,I,J,K,L  
 Capitol Stage Lighting Co., 527 W. 45 St., New York 36, N.Y.—B,F,J  
 Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—O  
 Century Lighting Inc., 521 W. 43 St., New York 36, N.Y.—A,R  
 Chadsey Corp., Box 1858, Hartford 1, Conn.  
 Champion Lamp Works, 600 Broad St., Lynn, Mass.—G,J  
 Churchill Lighting Corp., 344 Franklin St., Melrose 76, Mass.—H,J  
 Citation Products Co., 233 E. 146 St., New York 51, N.Y.—E,F  
 Compeco Corp., 2251 W. St. Paul Ave., Chicago 47, Ill.—A,F,H,J  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—N,O  
 Deitz Co., S. J., 38 River Edge Rd., River Edge, N.J.—N  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—A,B,C,E,H,L,N,P  
 DeMent Laboratories, New Flidner Bldg., Portland 5, Ore.—C,H  
 DIALIGHT CORP., 60 Stewart Ave., Brooklyn 37, N.Y.—E,F,P  
 Dorn Equipment Corp., 88 Broad St., Boston 10, Mass.—P  
 Drake Mfg. Co., 1713 W. Hubbard St., Chicago 22, Ill.—E,P  
 DuMONT LABS. INC., ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—A,R  
 Eagle Electric Mfg. Co., 23-10 Bridge Plaza South, Long Island City, N.Y.—A,G,J  
 ELECTRICAL TOWER SERVICE, 206 S. Washington St., Peoria 2, Ill.—N,P  
 Electric Storage Battery Co., 42 S. 15 St., Phila. 2, Pa.—K  
 Electro-Physics Co., 287 Broadway, New York 7, N.Y.—L  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—N  
 Electro-Tech Equipment Co., 308 Canal St., New York, N.Y.—F,L,N,O  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—G  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—L  
 Ericson Mfg. Co., 5209 Euclid Ave., Cleveland 3, Ohio—K  
 Fischer & Co., R.A., 517 Commercial St., Glendale 3, Calif.—N



Gale Dorothea Mechanisms, Inc., 81-01 Broadway, Elmhurst, Long Island, N.Y.—D,F  
 Gates & Co., Geo. W., Hempstead Turnpike & Lucille Ave., Franklin Square, Long Island, N.Y.—B,C,G,J,O  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—Q  
 General Communications, Box 169, Fort Atkinson, Wisc.—D  
 GENERAL ELECTRIC CO., Construction Materials Div., 1285 Boston Ave., Bridgeport 2, Conn.—A,G,J  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—E,Q  
 GENERAL ELECTRIC CO., Nela Park, Cleveland 12, Ohio—C,H,J  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—F,L,Q  
 Georator Corp., Manassas, Va.—O  
 Glens Falls Laboratory, Inc., 284 Glen St., Glens Falls, N.Y.—C  
 Haft & Sons, 950 Kent Ave., Brooklyn 5, N.Y.  
 Harwood Mfg. Co., 466 W. Superior St., Chicago 10, Ill.—K,R  
 Herzog Miniature Lamp Works, 12-23 Jackson Ave., Long Island City, N.Y.—J  
 Hetherington, Inc., Sharon Hill, Pa.—E  
 Hub Electric Co., 2255 W. Grand Ave., Chicago 12, Ill.—D,F,G,J,K,M  
 Hudson Lamp Co., 528 Elm St., Arlington, N.Y.—E,J,N  
 Huggins Labs., 700 Hamilton Ave., Menlo Park, Calif.—B,K,N,P,O,Q  
 Hughey & Phillips, P. O. Box 686, Encino, Calif.—A  
 Ideco Div., Dresser Stacey Company, 875 Michigan Ave., Columbus 15, Ohio—A  
 Industrial Electrical Works, 1509 Chicago St., Omaha, Nebr.—K  
 Inet, Inc., 8655 S. Main St., Los Angeles 3, Calif.—O  
 Instrument Devel. Labs., 163 Highland Ave., Needham Heights 94, Mass.—N  
 Int'l. Research & Devel. Corp., 1027 W. Fifth Ave., Columbus 8, Ohio—Q  
 iq Industries, 6110 Wuisnre Blvd., Los Angeles 36, Calif.—N  
 JOHNSON CO., E. F., Waseca, Minn.—E  
 Kent Metal Mfg. Co., 490 Johnson Ave., Brooklyn 37, N.Y.—C,G,J  
 Kepco Laboratories, 131-38 Sanford Ave., Flushing 55, N.Y.—O  
 Kinetex Instrument Co., 902 Broadway, New York 10, N.Y.—E  
 Kliegl Bros., 321 W. 50 St., New York 19, N.Y.—A,B,C,D,F,G,H,I,J,K,L,M,R  
 Kulka Electric Mfg. Co., 633 S. Fulton Ave., Mount Vernon, N.Y.—A  
 Lawter Chemicals, 3550 Touhy Ave., Chicago 45, Ill.—C,H  
 Lee Electric & Mfg. Co., 2806 Clearwater St., Los Angeles 39, Calif.—O  
 Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill.—N  
 Luxor Lighting Products, Empire State Bldg., New York, N.Y.—D,G,J  
 Lysox Mfg. Co., 1401 Clinton St., Hoboken, N.J.—N  
 Mackay Inc., A.D., 198 Broadway, New York 38, N.Y.—H  
 Marco Industries Co., 207 S. Helena St., Anaheim, Calif.—E,L,P  
 Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—L  
 Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—A  
 Matchless Electric Co., 1700 Washington Blvd., Chicago 12, Ill.—E,J,P  
 Menlo Research Laboratory, P. O. Box 522, Menlo Park, Calif.—C  
 MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass.  
 Micro Balancing, Inc., 191 Herricks Rd., Garden City Park, N.Y.—N  
 Microtran Co., Div. Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach 96, N.Y.—K  
 Midco Mfg. & Distr. Co., 13 & Ky. Sts., Sheboygan, Wis.—O  
 Miller Electric Co., P. O. Box 1827, Jacksonville, Fla.—D,F,N,O,P  
 Mitchell Mfg. Co., 2525 Claybourn Ave., Chicago 14, Ill.—G  
 Mole-Richardson Co., 937 N. Sycamore Ave., Hollywood 38, Calif.—B,J  
 Montgomery Mfg. Co., Owensville, Ind.—P  
 Multi-Tron Laboratory, 4624 Washington Blvd., Chicago 44, Ill.—N  
 Natural Lighting Corp., 1124 E. Colo. Blvd., Glendale 5, Calif.—A,I,J,K  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—D,M  
 Oleson Co., Otto K., 1534 Cahuenga Blvd., Hollywood 28, Calif.—A,D,F,G,J  
 Olin Industries, Inc., Electrical Div., 275 Winchester Ave., New Haven, Conn.  
 Onan & Sons Inc., D.W., University Ave., S.E. at 25 St., Minneapolis 14, Minn.—K,O

Opad-Green Co., 71 Warren St., New York 7, N.Y.—O  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—O  
 Pacific Transducer Corp., 11921 W. Pico Blvd., Los Angeles 64, Calif.—C  
 Perkins Eng'g Corp., 345 Kansas St., El Segundo, Calif.—O  
 Phoenix Precision Instrument Co., 3803 N. Fifth St., Philadelphia 40, Pa.—A,B,C,N  
 Photobell Co., 116 Nassau St., New York 38, N.Y.—N  
 Pioneer Electronics Corp., 24 Saunders St., Salem, Mass.—A  
 Pioneer Gen-E. Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.—K  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—C,H  
 Precision Associates, 354 Cumberland St., Brooklyn 17, N.Y.—O  
 Radio Research Laboratories, 172 Front St., St. Marietta, Ohio—A,C,G  
 RAYTHEON MFG. CO., Waltham 54, Mass.—O  
 Ripley Co., 1 Factory St., Middletown, Conn.—N  
 Rockwell Engineering Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—L  
 Rolab Studios, Walnut Tree Hill, Sandy Hook, Conn.—R  
 Shannon Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 46, Calif.—C,H  
 S.O.S. Cinema Supply, 602 W. 52 St., New York 19, N.Y.—A,B,E,G,I,J,K  
 Standard Electrical Products Co., 2240 E. 3 St., Dayton 3, Ohio.—F  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—D,J,K  
 Stroblite Co., 35 W. 52 St., New York 19, N.Y.—C,H  
 Strong Electric Corp., 87 City Park Ave., Toledo 2, Ohio—B,J,O  
 Superior Electric Co., 83 Laurel St., Bristol, Conn.—F  
 Switzer Bros., 4732 St. Clair Ave., Cleveland 3, Ohio—C,H  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—C,E,F,G,J,Q  
 Tabet Mfg. Co., 254 W. Tazewell St., Norfolk 10, Va.—A,N  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—A,F,G,I,J,L,R  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—A,E,F,G,J,K,N  
 Transformer Metal Products Corp., 343 W. 26 St., New York, N.Y.—E  
 Transformer Technicians, Inc., 2608 N. Cicero Ave., Chicago 39, Ill.—O  
 Trilsch Co., John D., 1310 McKinney Ave., Houston, Texas—A,N  
 TUNG-SOL ELECTRIC INC., 95 Eighth Ave., Newark 4, N.J.—J  
 Ucinite Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.—E  
 Verd-A-Roy Corp., 615 Front St., Toledo 5, Ohio—G,J  
 Vickers Electric Div., Vickers, Inc., 1835 Locust St., St. Louis 3, Mo.—F  
 Welch Electric Co., 1221 Wade St., Cincinnati, 14, Ohio—N  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—N  
 Wickes Engineering & Construction Co., 12 St. & Ferry Ave., Camden 4, N.J.—D  
 Wilcox Research Corp., 340 La Brea Ave., Los Angeles 36, Calif.—Q  
 Williams, Brown & Earle, Inc., 904 Chestnut St., Philadelphia 7, Pa.—A,L,Q  
 WINCHARGER CORP., E. 7 at Division St., Sioux City 2, Iowa—O  
 Worner Electronic Devices, Rankin, Ill.—N

## 38—MACHINE EQUIPMENT & ACCESSORIES

Air cleaners	A
Blower units	B
Bobbins	C
Crystal lapping discs	D
Crystal saw blades	E
Drive mechanisms	F
Dies	G
Electrodes, pressure welding	H
Jigs & fixtures	I
Soldering pots	J
Vacuum tube aging racks	K

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—C  
 Airborne Electronics Co., Hangar #6, Metropolitan Airport, Van Nuys, Calif.—I  
 AIR-MARINE MOTORS, INC., 3939 Merrick Rd., Seaford, N.Y.—B  
 American Wood Working Co., 1682 N. Lowell Ave., Chicago 39, Ill.—C  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—I  
 Beaver Pipe Tools, Inc., 310 Dana Ave., Warren, Ohio—F  
 Clements Mfg. Co., 6650 Narragansett Ave., Chicago 38, Ill.—B  
 Communication Products Co., Marlboro, N.J.—A

Curran Machine Works, 20-20 Steinway St., Long Island City, N.Y.—I  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—B,D,E,I  
 DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.—E  
 Dynamic Air Eng'g. Inc., 7412 Maie Ave., Los Angeles 1, Calif.—B  
 Eastern Air Devices Inc., 585 Dean St., Brooklyn 17, N.Y.—B  
 Electro Craft Inc., 68 Jackson St., Stamford, Conn.—I  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—B  
 Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, R.I.—F,I  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—C  
 Forsberg Mfg. Co., 125 Seaview Ave., Bridgeport 1, Conn.—I  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B  
 Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif.—F  
 Gries Reproducer Corp., 780 E. 133 St., New York 54, N.Y.—C  
 Haydu Bros., Box 1226, Plainfield, N.J.—K  
 Ideal Industries, 3316 Park Ave., Sycamore, Ill.—B  
 Independent Mfg. Co., 5 Bellevue Ave., East Riverton, N.J.—I  
 Induction Motors Corp., 55-15 37 Ave., Woodside 77, N.Y.—B  
 KAHLE ENGINEERING CO., 1307 Seventh St., North Bergen, N.J.—J  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—I  
 Larson Co., Chas. O., Sterling, Ill.—I  
 Leiman Bros., 146 Christie St., Newark 5, N.Y.—B  
 Lima Electric Motor Co., Findlay Rd., Lima, Ohio—F  
 Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—F  
 Mars Eng'g & Mfg. Co., 3000 N. San Fernando Blvd., Burbank, Calif.—I  
 Master Appliance Mfg., Co., 4 & Ontario Sts., Racine, Wis.—B  
 Eng'g. Labs., 260 Nassau St., Princeton, N.J.—B  
 Multi-Tron Lab., 4642 Washington Blvd., Chicago 44, Ill.—I  
 National Gasket & Washer, 124 E. 25 St., New York 10, N.Y.—D  
 Peerless Electric Co., 1401 W. Market St., Warren, Ohio—B  
 Phila. Scientific Glass Co., Abington, Pa.—H  
 Pioneer Electric & Research, 743 Circle Ave., Forest Park, Ill.—B  
 Precision Products, 719 7 St., N.W., Washington, D.C.—D  
 Production Tool & Fixture Co., 37 W. Main St., Oyster Bay, N.Y.—I  
 RAYTHEON MFG. CO., Waltham 54, Mass.—A,F  
 Redmond Co., Owosso, Mich.—B  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—F  
 Research Instrument Co., 233 Broadway, New York 7, N.Y.—F,G,I  
 Ripley Co., 1 Factory St., Middletown, Conn.—B  
 Robinette Co., W. C., 802 Fair Oaks Ave., S. Pasadena, Calif.—F  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—F  
 Ryan Industries, 19159 John R St., Detroit 3, Mich.—I  
 Sherman Industrial Electronics Co., 5050 Washington Ave., Belleville, N.J.—AD  
 Stanat Tool & Machine Co., 47-28 37 St., Long Island City, 1, N.Y.—I  
 Standard Electric Mfg. Co., Haddon Ave., W. Berlin, N.J.—B  
 St. Warm Electric Co., 553 N. Chestnut St., Ravenna Ohio—J  
 Stone City, P. O. Box 351 Bedford, Ind.—G,I  
 Sunrise Products Co., P. O. Box 173, Hawthorne, N.J.—H,J  
 Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—G  
 Telex, Inc., 1633 Eustis St. Paul, Minn.—C  
 Torit Mfg. Co., 292 Walnut St., St. Paul Minn.—B  
 Tri-Kris Co., Walnut & Cleveland Sts., Lansdale, Pa.—I  
 Vulcan Electric Co., 88 Holton St., Danvers, Mass.—J  
 Waage Electric, Inc., 720 Colfax Ave., Kenilworth, N.J.—J  
 Whistler & Sons, Inc., S. B., 752 Military Rd., Buffalo 23, N.Y.—G

### 39—MEASUREMENT & TEST EQUIPMENT—BRIDGES

Bridges, capacitance ..... A  
 Bridges, impedance ..... B  
 Bridges, inductance ..... C  
 Bridges, resistance ..... D  
 Bridges, temperature ..... E

AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—A  
 Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—D

Austin Co., 76 9 Ave., New York 11, N.Y.—D  
 Baldwin-Lima-Hamilton, Phila. 42, Pa.—D  
 Barnes Devel. Co., 213 W. Baltimore Pike, Lansdowne, Pa.—A,D,E  
 BENDIX AVIATION, CINCINNATI DIV., 203 W. 3 St., Cincinnati 2, Ohio—D  
 Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.—D  
 BOGART MFG., 315 Seigel St., B'klyn. 6, N.Y.—B,D  
 BOONTON RADIO CORP., Boonton, N.J.—A,B,C,D  
 Borden Eng'g Co., 63 Clinton Ave., New Providence, N.J.—D  
 Bristol Co., Waterbury 20, Conn.—A,B,C,D,E  
 Bristol Eng'g. Corp., Bristol, Pa.—A,B,C  
 Brown Electro-Measurement Corp., 4635 S.E. Hawthorne Blvd., Portland 15, Ore.—A,B,C,D  
 BRUSH ELECTRONICS, 3405 Perkins Ave., Cleveland 14, Ohio—A,C,D  
 Cambridge Instrument Co., Grand Central Terminal, New York 17, N.Y.—A  
 Central Radio Co., 275 Mass. Ave., Cambridge 39, Mass.—B  
 Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.—D  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—A,B,C,D,E  
 Clippard Instrument Lab., 7390 Colerain Rd., Cincinnati 24, Ohio—A,D  
 Clough-Brengle Co., 6014 Broadway, Chicago 40, Ill.—A,C,D  
 Communication Measurements Lab., 350 Le-lan Ave., Plainfield, N.J.—D  
 Conant Labs., 6500 "O" St., Lincoln 5, Nebr.—A,B,C  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—D  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—A  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kans.—A,B,C,D,E  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—A,B,D  
 DX RADIO PRODUCTS, 2300 W. Armitage Ave., Chicago 47, Ill.—A,B  
 Electrodyne Co., Norwood, Mass.—A,D  
 Electro-Mec Lab., 19 Murray St., New York 7, N.Y.—D  
 Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—A,B,D  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—A,C,D,E  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—B  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—A,D  
 Equipment & Service, 6815 Oriole Dr., Dallas 9, Texas—B,C,D  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D,E  
 Feiler Eng'g. & Mfg., 8026 N. Monticello Ave., Skokie, Ill.—A,B,C,D  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—A,B,C,D  
 Gaskin Co., 1005 S. Aurora Way, Wheaton, Ill.—B  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—A  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,B,C,D  
 GULTON MFG. CO., 212 Durham Ave., Metuchen, N.J.—A  
 HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—A,B,C,D  
 HI Q DIV., AEROVOX CORP., Olean, N.Y.—A  
 Industrial Electronic Engr's., 3973 Lankershim Blvd., N. Hollywood, Calif.—D  
 Industrial Electronics, 8060 Wheeler St., Detroit 10, Mich.—D  
 Industrial Instruments, 89 Commerce Rd., Cedar Grove, N.J.—A,D  
 Industrial Transformer, Gouldsboro, Pa.—C  
 Jackson Electrical Instrument Co., 18 S. Patterson Blvd., Dayton 1, Ohio—A  
 MacLeon & Hanopol, 10 Roland St., Charlestown 9, Mass.—A  
 Marconi Instruments, Ltd., 23 Beaver St., New York 4, N.Y.—A,B,C,D  
 Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—D  
 MEASUREMENTS CORP., Boonton, N.J.—A,C,D  
 Metropolitan Electronics & Instruments, 106 5 Ave., New York 11, N.Y.—A,D  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—A  
 National Vulcanized Fibre Co., Wilmington, Dela.  
 Penna. Testing Lab., Doylestown, Pa.  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—D  
 Phila. Scientific Glass Co., Abington, Pa.—E  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—B  
 POLYTECHNIC RESEARCH & DEVEL. CO., 55 Johnson St., Brooklyn 1, N.Y.  
 Pyrometer Instrument Co., 92 Portland Ave., Bergenfield, N.J.—E  
 Radex Corp., 2076 Elston, Chicago 14, Ill.—B  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—D  
 Reiner Electronics Co., 152 W. 25 St., New York 1, N.Y.—D  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—A  
 Rockwell Eng'g. Co., 4063 N. N. J. St., Indianapolis 5, Ind.—E

Scott Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—A,D  
 Simmonds Aerocessories Inc., 105 White Plains Rd., Tarrytown, N.Y.—A  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—A  
 Southwestern Industrial Electronics, 2831 Post Oak Rd., Houston, Texas—A,B,C,D  
 Special Instruments Lab., 1003 Highland Ave., Knoxville, Tenn.—D  
 SPRAGUE ELECTRIC CO., 233 Marshall St., N. Adams, Mass.—A  
 Sticht Co., Herman H., 27 Park Pl., New York 7, N.Y.—D  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—A  
 Tech Labs. Inc., 120 Hillcrest Ave., Leonia, N.J.—B,D  
 Technology Instrument Corp., 533 Main St., Acton, Mass.  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—E  
 Trans-Sonics, Inc., Bedford Airport, Bedford, Mass.—D,E  
 Videon Electronic Corp., 222 E. Ohio St., Indianapolis 4, Ind.—D  
 Weston Labs., Oak Hill Rd., Harvard, Mass.—A,B,D,E

### 40—MEASUREMENT & TEST EQUIPMENT—COUNTERS

Counters, electronic ..... A  
 Counters, events-per-unit time .... B  
 Counters, frequency ..... C  
 Counters, geiger ..... D  
 Counters, impulse ..... E  
 Counters, mechanical ..... F  
 Counters, radiation ..... G  
 Counters, revolution ..... H  
 Counters, time-measuring ..... I

Acromark, 9 Morrell, Elizabeth 4, N.J.—F  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—A,B,I  
 Alco Mfg. Co., 4011 Cuming St., Omaha 3, Nebr.—D,G  
 Alina Corp., 401 Broadway, New York 13, N.Y.—I  
 American Chronoscope Corp., 316 W. 1 St., Mount Vernon, N.Y.—I  
 American Electroneering Corp., 2040 Colo. Ave., Santa Monica, Calif.—A  
 Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y.—D  
 Anton Electronic Labs., 1226 T. Flushing Ave., Brooklyn 37, N.Y.—D,G  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—A,B,C,D,E,G,H  
 Atomlab, Inc., 489 5 Ave., New York 17, N.Y.—B,D  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—A  
 Audio & Video Products, 730 5 Ave., New York 19, N.Y.—I  
 Austin Co., 76 9 Ave., New York 11, N.Y.—A,B,D,G  
 Automatic Temperature Control Co., 5212 Pulaski Ave., Philadelphia 44, Pa.—A,H  
 Autotron Co., 128 W. Main St., Danville, Ill.—A  
 Barton Electronics, 955 Asylum Ave., Hartford 5, Conn.—A  
 Bassett Inc., Rex, 1314 N.E. 17 Court, Ft. Lauderdale, Fla.—C  
 Batson Electronics, J.A., 1031 S. 27 St., Omaha, Nebr.—D,H  
 Baugham Co., E.J., 350 S. Central, Los Angeles 13, Calif.—A  
 BERKELY SCIENTIFIC DIV., BECKMAN INSTRUMENTS, INC., Richmond 3, Calif.—A,B,C,D,F,G,H,I  
 Beta Electric Corp., 333 E. 103 St., New York 29, N.Y.—H  
 Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.—C,H  
 Boesch Mfg. Co., Danbury, Conn.—A,F  
 BOGART MFG. CO., 315 Seigel St., Brooklyn 6, N.Y.—A  
 Bristol Eng'g. Corp., Bristol, Pa.—A,C,I  
 BRUSH ELECTRONICS, 3405 Perkins Ave., Cleveland 14, Ohio—B,G  
 Bunnell & Co., J. H., 81 Prospect Pl., Brooklyn 1, N.Y.—I  
 BURROUGHS ADDING MACHINE CO., 511 N. Broad St., Philadelphia 23, Pa.—A  
 Carlson & Nicholson, 497 Maynard Dr., Buffalo 21, N.Y.—I  
 Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—C  
 Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—A,B,C  
 Clebar Watch Agency, 521 5 Ave., New York 17, N.Y.—I  
 Color Television, Inc., 973 E. San Carlos Ave., San Carlos, Calif.—A  
 Consolidated Productions, Bldg. 9, Broward Int'l. Airport, Ft. Lauderdale, Fla.—B,F  
 Cramer Co., R. W., Box 49, Centerbrook, Conn.—I  
 Deagan Inc., J. C., 1770 W. Berceau Ave., Chicago 13, Ill.—C  
 Decade Instrument Co., Box 153, Caldwell, N.J.—A,B,C

Detectron Co., 5631 Cahuenga Blvd., N. Hollywood, Calif.—A,B,C,D,E,G  
 Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—A,B,C,D,E,F,G,H,I  
 Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio—I  
 Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—I  
 Dorothea Mechanisms, Inc., Gale, 81-01 Broadway, Elmhurst, L.I., N.Y.—E,I  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—A,B,C  
 Ducommun Co., M, 580 5 Ave., New York 36, N.Y.—I  
 DUMONT LABS. INC., ALLEN B., Instrument Div., 760 Bloomfield Ave., Clifton, N.J.—I  
 Durant Mfg. Co., 1950 N. Buffum St., Milwaukee 1, Wis.—A,F,H  
 Eagle Signal Corp., 202 20 St., Moline, Ill. B,E,F,H  
 Egan Lab., 107-56 113 St., Richmond Hill 19, N.Y.—D  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—A  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—A,D,F,H  
 Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.—A  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—A,B,C,D,E,G  
 Eng'g. Research Assoc. Inc., Div., Remington-Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—A,E  
 Eng'g. Research & Devel. Co., Addison, Ill.—B  
 Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, R.I.—A,F  
 Equipment & Service, 6815 Oriole Dr., Dallas 9, Texas—A,B,C,D,E,G,I  
 Ernst Norrman Labs., Williams Bay, Wis.—I  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D,E,G  
 Flett Lab., 3711 Marshall Rd., Drexel Hill, Pa.—D  
 GATES RADIO, 123 Hampshire St., Quincy, Ill.—C  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—A,C  
 GENERAL RADIO, 275 Mass. Ave., Cambridge 39, Mass.—I  
 Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif.—H  
 Georator Corp., Manassas, Va.—D  
 Glaser-Steers, Belleville, N.J.—A  
 Gorrell & Gorrell, Haworth, N.J.—B,F,I  
 Haledy Electronics, 57 William St., New York 5, N.Y.—A,B,C,F  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—A,B,C,H  
 Industrial Electronics, Hanover, Mass.—A  
 Industrial Electronic Eng'rs., 3973 Lankershim Blvd., N. Hollywood, Calif.—A,E,F  
 Int'l. Research Assoc., 2221 Warwick Ave., Santa Monica, Calif.—D  
 iq Industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—A,B  
 JAMES KNIGHTS CO., Sandwich, Ill.—C  
 J-B-T INSTRUMENTS, 441 Chapel St., New Haven, Conn.—I  
 Lektra Labs. Inc., 154 11 Ave., New York 11, N.Y.—A  
 MacKenzie Products, 141 Brewery St., New Haven, Conn.—C,I  
 Magne-Pulse Corp., 140 Nassau St., New York 38, N.Y.—A,E  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,G  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—A,I  
 Masco Products, 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—I  
 Menlo Research Lab., P. O. Box 522, Menlo Park, Calif.—D,G  
 Metrotype Corp., 525 W. 76 St., Chicago, Ill.—E  
 Minn. Electronics Corp., 47 W. Water St., St. Paul 1, Minn.—A  
 Montgomery Mfg. Co., Owensville, Ind.—I  
 New London Instrument Co., P. O. Box 189, New London, Conn.—D,G  
 North American Philips Co., Mt. Vernon, N.Y.—A  
 Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.—A,D,E,G  
 Nuclear Measurements, 2460 N. Arlington Ave., Indianapolis 18, Ind.—A,B,D,G  
 Nuclear Research Corp., 2563 Grays Ferry Ave., Philadelphia 46, Pa.—D,G  
 Nuclear Research & Devel. Co., 6425 Etzel Ave., St. Louis 14, Mo.—A,G  
 Nucleonic Co. of America, 497 Union St., Brooklyn 31, N.Y.—A,D  
 Pantek Co., 208 42 St., Manhattan Beach, Calif.—A,B  
 Phila. Scientific Glass Co., Abington, Pa.—F  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—A  
 Photobell Co., 116 Nassau St., New York 38, N.Y.—A  
 Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—A  
 Post Machinery Co., 140 Elliott St., Beverly, Mass.—A  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, L.I., N.Y.—A,B,C,E,G,H,I  
 Precision Radiation Instruments, 2235 S. La Brea St., Los Angeles 16, Calif.—D,G  
 Radar-Electronics, Inc., 229 W. 28 St., New York 1, N.Y.—A,C  
 Radioactive Products, Inc., 443 W. Congress St., Detroit 26, Mich.—A  
 R. C. Scientific Instrument Co., 307 Culver Blvd., Playa Del Rey, Calif.—D,G



Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—A,C,D,E,G  
 Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford 6, Conn.—I  
 Robinette Co., W. C., 802 Fair Oaks Ave., S. Pasadena, Calif.—I  
 Rockwell Eng'g. Co., 4063 N. N.J. St., Indianapolis 5, Ind.—I  
 Rutherford Electronics, 3707 S. Robertson Blvd., Culver City, Calif.—A,I  
 Sessions Clock Co., Forestville, Conn.—I  
 Shoup Eng'g. Co., 221 E. Cullerton St., Chicago 16, Ill.—G  
 Special Instruments Lab., 1003 Highland Ave., Knoxville, Tenn.—D,G,I  
 Standard Electric Time Co., 119 Logan St., Springfield, Mass.—A,B,C,E,H,I  
 Stewart Instrument Co., 6507 Grand River, Detroit 8, Mich.—B,E,I  
 Sticht Co., Herman H., 27 Park Pl., New York 7, N.Y.—A,H,I  
 Streeter-Amet, 4101 Ravenswood Ave., Chicago 13, Ill.—A,B,C,D,E,F,G,H  
 Technical Operations, Inc., 6 Schouler Court, Arlington, Mass.—D,G  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—A,I  
 Telecomputing Corp., 133 E. Santa Anita Ave., Burbank, Calif.—A,E,H  
 Teleregister Corp., 157 Chambers St., New York 7, N.Y.—E  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,B,C,E,F,H,I  
 Tork Clock Co., 1 Grove St., Mount Vernon, N.Y.—I  
 Tracerlab, Inc., 130 High St., Boston 10, Mass.—A,B,D,G  
 Veeder-Root, Inc., 70 Sargent St., Hartford 2, Conn.—F,H  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—D,G  
 Victory Eng'g. Corp., Union, N.J.—G  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—A,B,C,E,H,I  
 Wang Labs., 296 Columbus Ave., Boston 16, Mass.—A,E  
 Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—D,G  
 Weston Labs., Oak Hill, Harvard, Mass.—I  
 Wilson & Co., G. C., 2 N. Passaic Ave., Chatham, N.J.—I  
 Wood Counter Lab., N., 5491 Blackstone Ave., Chicago 15, Ill.—D,G  
 Yellow Springs Instrument Co., P. O. Box 106, Yellow Springs, Ohio—I

**41—MEASUREMENT & TEST EQUIPMENT—DECADE BOXES**

- Decade boxes, capacitance . . . . . A
- Decade boxes, inductance . . . . . B
- Decade boxes, resistance . . . . . C

Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—C  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—B  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A,C  
 Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.—A,C  
 CINEMA ENG'G. CO., Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—C  
 Coast Coil Co., 5352 W. Washington Blvd., Los Angeles 16, Calif.—B  
 Communication Accessories Co., Hickman Mills, Mo.—B  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—A  
 Daven Co., 191 Central Ave., Newark 4, N.J.—C  
 Decade Instrument Co., Box 153, Caldwell, N.J.  
 Electrodyne Co., Endicott St., Norwood, Mass.—A,C  
 Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—C  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—A,B,C  
 Electro-Technics, 198 Albion Ave., Paterson, N.J.—B  
 Equipment & Service, 6815 Oriole Dr., Dallas 9, Texas—C  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,C  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—A,B  
 Gaskin Co., 1005 S. Aurora Way, Wheaton, Ill.—B,C  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,B,C  
 G & M Equip. Co., 7315 Varna Ave., North Hollywood, Calif.—A,B,C

Hycor, Co., Inc., 11423 Van Owen St., N. Hollywood, Calif.—B  
 Industrial Instruments, 89 Commerce Rd., Cedar Grove, N.J.—A,C  
 Lcc Electronic Labs., Inc., 233 Dudley St., Boston 19, Mass.—A,C  
 Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—B  
 Lux Industries, Inc., 38 Argyle Park, Buffalo 22, N.Y.—G  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—A,C  
 Metropolitan Electronics & Instruments Co., 106 5 Ave., New York 11, N.Y.—A,C  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—A  
 Ohmite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill.—C  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—B  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—C  
 Precise Devel. Corp., 999 Long Beach Rd., Oceanside, N.Y.—A,B,C  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—K  
 Rochester Electronics Co., P. O. Box 227, Penfield, N.Y.—C  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—C  
 Sticht Co., Herman H., 27 Park Pl., New York 7, N.Y.—C  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—C  
 Torcoil Co., 1374 Mobile Ct., St. Louis 10, Mo.—B  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—B  
 Welch Mfg. Co., W.M., 1515 Sedgwick Ave., Chicago 10, Ill.—A,C  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—C

**42—MEASUREMENT & TEST EQUIPMENT—GENERATORS**

- Generators, A-F signal . . . . . A
- Generators, F-M signal . . . . . B
- Generators, harmonic . . . . . C
- Generators, microwave signal . . . . . D
- Generators, noise . . . . . E
- Generators, pulse . . . . . F
- Generators, R-F signal . . . . . G
- Generators, square wave . . . . . H
- Generators, sweep . . . . . I
- Generators, sync . . . . . J
- Generators, television, composite signal . . . . . K
- Generators, timing marker . . . . . L
- Generators, video signal . . . . . M

Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N.Y.—L  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—A  
 AIRCRAFT RADIO CORP., Boonton, N.J.—G  
 American Electroengineering Corp., 2040 Colo. Ave., Santa Monica, Calif.—G  
 Anderson Labs., 39 Talcott Rd., West Hartford 10, Conn.—F  
 Approved Electronic Instrument, 928 Broadway, New York 10, N.Y.—A,B,I  
 Arenberg Ultrasonic Lab., 94 Green St., Jamaica Plain 30, Mass.—L  
 A.R.F. Products, Inc., 7627 Lake St., River Forest, Ill.—B,G  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—F  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—A,H  
 Baugham Co., E. J., 350 S. Central, Los Angeles 13, Calif.—G,I,K  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, 2200 Wright Ave., Richmond 3, Calif.—F  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—D,F,G,H,I,J  
 BOONTON RADIO CORP., Intervale Rd., Boonton, N.J.—B,D,G  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol Pa.—A,B,C,D,E,F,G,H,I,J,K,L,M  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A,B,K  
 Browning Labs., Winchester, Mass.—I,L  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—A  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—G  
 BURROUGHS ADDING MACHINE CO., 511 N. Broad St., Philadelphia 23, Pa.—F  
 Carlson & Nicholson, 497 Maynard Dr., Buffalo 21, N.Y.—F  
 CENTURY ELECTRONICS, DIV., CENTURY METALCRAFT CORP., 14806 Oxnard St., Van Nuys, Calif.—D  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—L  
 CENTURY METALCRAFT, 14806 Oxnard St., Van Nuys, Calif.—G  
 Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—F

- Clough-Brengle Co., 6014 Broadway, Chicago 40, Ill.—A,G  
 Color Television Inc., 973 E. San Carlos, Calif.—A  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—A,G  
 Constable Eng'g. Co., J. M., 101-05 77 St., Ozone Park 17, N.Y.—H  
 Crown Eng'g., 3821 Commercial N. E., Albuquerque, N.M.—I  
 CRUCIBLE STEEL CO. OF AMERICA, Oliver Bldg., Pittsburgh 30, Pa.—L,M  
 Dade Bros., Old Country Rd., Mineola, L.I., N.Y.—F  
 Daven Co., 191 Central Ave., Newark 4, N.J.—A,B  
 Decade Instrument Co., Box 153, Caldwell, N.J.—A,B,G,I,K  
 DeMornay-Bonardi, 3223 Burton Ave., Burbank, Calif.—D,H,I  
 DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—D  
 Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—F,H,L  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—A,B,G,I,K  
 DUMONT LABS, INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—H,K  
 DUMONT LABORATORIES, INC., ALLEN B., 2 Main Ave., Passaic, N.J.—J  
 DX RADIO PRODUCTS, 2300 W. Armitage Ave., Chicago 47, Ill.—A,G  
 Eicor Inc., 1501 W. Congress St. Chicago 7, Ill.—A  
 Electrical & Physical Instrument Corp., 25 W. 43 St., New York 36, N.Y.—F,H  
 Electro-Mechanical Research, Inc., 64 Main St., Ridgefield, Conn.—H  
 Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—A,B,G,H,I  
 Electronic Measurements Co., Lewis St. & Maple Ave., Eatontown, N.J.—A  
 Electronic Systems Co., 578 E. 161 St., New York 56, N.Y.—F  
 Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—I  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—D,E,F  
 Electro-Tech Equipment Co., 308 Canal St., New York, N.Y.—A,B  
 Elk Electronic Labs. Inc., 333 W. 52 St., New York 19, N.Y.—A,B,E,G,H  
 El-Rad Mfg. Co., 2800 W. Cullom, Chicago 18, Ill.—F  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—F,H,I  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—B,D,F,G,M  
 Empire Devices, Inc., 38-25 Bell Blvd., Bayside 61, N.Y.—D,E,F  
 Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio—D,G  
 Equipment & Service, 6815 Oriole Dr., Dallas 9, Texas—A,B,C,D,E,F,G,H,I  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D,E,F,G,H,I,J,L,M  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—B,G  
 Federal Mfg. & Eng'g. Corp., 199 Steuben St., Brooklyn 5, N.Y.—D,G  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,E,G,H,I  
 Ferris Instrument Co., 110 Cornelia St., Boonton, N.J.—B,G  
 Ferroxcube Corp., Saugerties, N.Y.—J,K  
 Fischer, R. A. & Co., 517 Commercial St., Glendale 3, Calif.  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—A,B,G  
 GALBRAITH & SON, 450 6 Ave., New York 11, N.Y.—A  
 Gaskins Co., 1005 S. Aurora Way, Wheaton, Ill.—A,L  
 GENERAL CERAMICS & STEATITE CORP., Keasbey, N.J.—J,K  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—I  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,E,F,G,H  
 Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif.—F  
 GERTSCH PRODUCTS, 11846 Miss. Ave., Los Angeles, Calif.—G  
 G & M Equip. Co., 7315 Varna Ave., N. Hollywood, Calif.—A,B,D,F,G  
 Gorrell & Gorrell, Haworth, N.J.—L  
 Granco Products Inc., 36-17 20 Ave., Long Island City 5, N.Y.—G,K,I  
 Greibach Research & Devel. Labs, 80 Pryer Terrace, New Rochelle, N.Y.—A  
 G. W. Associates, P. O. Box 2263, El Segundo, Calif.—D  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—A,D,F,G,H,M  
 HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—A,B,E,G,H,I,K,M  
 Hycon Mfg. Co., 2961 S. Colo. Blvd., Pasadena 8, Calif.—G  
 Jackson Electrical Instrument Co., 18 S. Patterson Blvd., Dayton 1, O.—A,B,G,I,M  
 KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N.J.—D,E,F,I,L,M  
 KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—C,I  
 Krohn-Hite Instrument Co., 580 Mass. Ave., Cambridge 39, Mass.—A,H  
 Lab. for Electronics, 75 Pitts St., Boston, Mass.—D  
 Lavoie Labs. Inc., Morganville, N.J.—C,G  
 Linear Equip. Labs., Brightwater Pl., Masapequa, N.Y.—I  
 Loral Electronics Corp., 794 E. 140 St., New York 54, N.Y.—F,G  
 Lux Industries, Inc., 38 Argyle Park, Buffalo 22, N.Y.—A,D,E,F,G  
 Magnex Corp., 902-28 Van Wyck Expressway, Jamaica 18, N.Y.—F,G  
 Makepeace Co., D. E., Attleboro, Mass.  
 Manson Labs., 207 Greenwich Ave., Stamford, Conn.—F  
 Manufacturers Eng'g. & Equip., York & Mill Sts., Hatboro, Pa.—I  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—A,B,D,E,F,G,H,I  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—J  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—A,F,H  
 Maxson Corp., W.L., 460 W. 34th St., New York 1, N.Y.—D  
 MEASUREMENTS CORP., Boonton, N.J.—A,B,D,F,G,H  
 Mercury Electronic Co., Box 450, Red Bank, N.J.—A,B,D,F,G,H  
 Metropolitan Electronics & Instruments Co., 106 5 Ave., New York 11, N.Y.—A,B,C,K  
 Microlab, 301 S. Ridgewood Rd., S. Orange, N.J.—D  
 Microtran Co., Div. Crest Labs. 84-11 Rockaway Beach Blvd., Rockaway Beach, N.Y.—G  
 Mil Instrument Corp., 92-15 172 St., Jamaica 33, N.Y.—A,B,F,J,K  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—I  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—F  
 National Electronics Labs., 1713 Kalorama Rd., N.W., Washington 9, D.C.—A  
 NATIONAL MOLDITE CO., 1410 Chestnut Ave., Hillside 5, N.J.—J,K  
 New London Instrument Co., P. O. Box 189, New London, Conn.—B,D,E,G,H,I  
 Northeastern Eng'g. Corp., S. Bedford St. Manchester, N.H.—D,F  
 Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.—F,H  
 Oak Ridge Products Mfg. Div. Video Television, Inc., 92-15 172 St., Jamaica 33, N.Y.—A,B,F,J,K  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—A,B,G,K  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—D,G,K  
 POLYTECHNIC RESEARCH & DEVEL., 55 Johnson St., Brooklyn 1, N.Y.—A,B,D,E,I  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—F  
 Precise Development Corp., 999 Long Beach Rd., Oceanside, L.I., N.Y.—A,B,F,G,H,I  
 Precision Apparatus Co., 92-27 Horace Harding Blvd., Elmhurst, N.Y.—G,I  
 Pulse Techniques, Inc., 1411 Palisade Ave., W. Englewood, N.J.—A  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—A,B,G,H,I,K,M  
 RADIO CORP. OF AMERICA, RCA TUBE DEPT., 415 S. 5 St., Harrison, N.J.—I,J,K  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV. ENG'G. PRODUCTS DIV., Camden 2, N.J.—A,G,H,I,J,K  
 Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—A,B  
 Reiner Electronics Co., 152 W. 25 St., New York 1, N.Y.—H  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—D,E,F,G,H,I,J  
 Research Electronics Labs., Roslyn, Pa.—F  
 Rollin Co., 2010 N. Lincoln Ave., Pasadena 3, Calif.—B,D,G,I  
 Rutherford Electronics Co., 3707 S. Robertson Blvd., Culver City, Calif.—F,H,L  
 Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—E  
 Selector Industries, 401 E. 138 St., New York 54, N.Y.—A,G  
 Servo Corp. of America, 2020 Jericho Turnpike, New Hyde Park, L.I., N.Y.—G,I,L  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—C  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—B,G,I,M  
 Sound Apparatus Co., Sterling, N.J.—I  
 Southwestern Industrial Electronics, 2831 Post Oak Rd., Houston, Texas.—A  
 Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—F,H,I  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—I  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—J,K  
 Supreme, Inc., Greenwood, Miss.—A,B,G,K,M  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—A,B,I  
 Syntonic Instruments, Inc., 100 Industrial Rd., Addison, Ill.—F,I,L  
 Tally Register Corp., 5300 14 Ave. N. W., Seattle 7, Wash.—F,H  
 Technitrol Eng'g. Co., 2751 N. 4 St., Philadelphia 33, Pa.—F  
 Technology Instrument Corp., 53 Main St., Acton, Mass.—G  
 Tektronix, Inc., P. O. Box 831, Portland 7, Ore.—H,L  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—B,E,F,G,H,I,J,K,L,M  
 Telemarine Communications Co. 3040 W. 21 St., Brooklyn 24, N.Y.—D,F,G,I,L  
 Telesup Radio Co., 2559 W. 21 St., Chicago 8, Ill.—J,K,M  
 Telerad Mfg. Corp., 1440 Broadway, New York 18, N.Y.—D  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—M  
 Television Utilities Corp., 1315 Jericho Turnpike, New Hyde Park, L.I., N.Y.—K  
 Teletronics Lab., 54 Kinkel St., Westbury, L.I., N.Y.—A,F,L  
 TEL-INSTRUMENT CO., 50 Paterson Ave., E. Rutherford, N.J.—I,K,L  
 Telonic Instruments, 444 S. Rural St., Indianapolis 1, Ind.—I  
 Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio—A,B,G,I  
 Triumph Mfg. Co., 913 Van Buren, Chicago 7, Ill.—H  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—D  
 Videon Electronic Corp., 222 E. Ohio St., Indianapolis 4, Ind.—G  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—F,H  
 Wang Labs., 296 Columbus Ave., Boston 16, Mass.—K,M  
 Waveline, Inc., Passaic Ave., Caldwell, N.J.—D,G  
 Weinschel Eng'g. Co., 1051 Metropolitan Ave., Kensington, Md.—A  
 Weston Labs., Inc., Oak Hill Rd., Harvard, Mass.—A,D,E,F,G,H  
 Wunderlich Radio Co., 25 Ave., New York 11, N.Y.—G

### 43—MEASUREMENT & TEST EQUIPMENT—MONITORS

- Monitors, antennas phase . . . . . A
- Monitors, audio . . . . . B
- Monitors, frequency . . . . . C
- Monitors, modulation . . . . . D
- Monitors, service . . . . . E
- Monitors, video line . . . . . F
- Monitors, video off-the-air . . . . . G
- Monitors, waveform . . . . . H

- Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—A  
 ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—O  
 Baughman Co., E.J., 350 S. Central, Los Angeles 13, Calif.—F,G,H  
 BOGART MFG. CO., 315 Seigel St., Brooklyn 6, N.Y.—C  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,B,C,D,F,G,H  
 Browning Labs, Inc., 750 Main St., Winchester, Mass.—D  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—B,C,D  
 BURKE & JAMES, INC., 321 S. Wabash Ave., Chicago 4, Ill.  
 Commercial Radio Monitoring Co., P. O. Box 7037, Kansas City, Mo.—D  
 Conn Ltd., C.G., 1101 E. Beardsley, Elkhart, Ind.—C  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—B,H  
 DUMONT LABS, INC., ALLEN B., 2 Main Ave., Passaic, N.J.—C,D,F,G,H  
 Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—H  
 Eng'g Research Assoc. Inc., Div. Remington Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—H  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—B,C,D  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D,F,H  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—B,C,D,H  
 General Communications, P. O. Box 169, Fort Atkinson, Wisc.—B,F,G,H  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—C,D  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—C,D,F  
 G & M Equipment Co., 7315 Varna Ave., North Hollywood, Calif.—C  
 Hazeltine Electronics Corp., 58-25 Little Neck Pkwy., Little Neck, L.I., N.Y.—D  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—C,D  
 Int'l Electronics Corp., 147 Parkhouse St., Dallas 2, Texas—B  
 Int'l Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—F,G  
 JAMES KNIGHTS CO., Sandwich, Ill.—C,D  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—C,D  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—F,G,H  
 Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill.—C,D  
 Pickard & Burns, 240 Highland Ave., Needham, Mass.—A  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—B  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—C,F,H  
 POLYTECHNIC RESEARCH & DEVEL., 55 Johnson St., Brooklyn 1, N. Y.—C  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—A,C  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., ENG'G. PRODUCTS DIV., Camden 2, N.J.—A,B,C,D,F,G,H

Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—B  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—F,G  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A,B,C,D,F,G,H  
 Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—F  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—F,G,H  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—F  
 Television Utilities Corp., 1315 Jericho Turnpike, New Hyde Park, L.I., N.Y.—E,F,G  
 Torngron Co., C. W., 236 Pearl St., Somerville, Mass.—A  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—C  
 Waveforms, Inc., 333 6 Ave., New York, N.Y.—B  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—C,D

#### 44—MEASUREMENT & TEST EQUIPMENT— OSCILLATORS

Oscillators, audio .....A  
 Oscillators, R-F .....B  
 Oscillators, tuning fork .....C  
 Oscillators, ultrasonic .....D  
 Oscillators, video pattern .....E  
 Oscillators, video range .....F

Airborne Instruments Laboratory, 160 Old Country Rd., Mineola, N.Y.—B  
 ALCO ELECTRONICS MFG. CO., 102 Marston St., Lawrence, Mass.—A  
 American Electroneering Corp., 2040 Colo. Ave., Santa Monica, Calif.—B  
 American Time Products, Inc., 580 5 Ave., New York, N.Y.—C  
 Arenberg Ultrasonic Lab., 94 Green St., Jamaica Plain 30, Mass.—D  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—A,B  
 Biddle Co., James G., 1316 Arch St., Philadelphia 7, Pa.—C  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,B,D,E,F  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—A,D  
 Bunnell & Co., J.H., 81 Prospect St., Brooklyn 1, N.Y.—C  
 C.G.S. Laboratories, Inc., 391 Ludlow St., Stamford, Conn.—A,B,D,E  
 Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—D  
 Clough-Brengle Co., 6014 Broadway, Chicago 40, Ill.—A,B  
 Color Television Inc., 973 E. Carlos Ave., San Carlos, Calif.—A  
 Communication Measurements Lab., 350 Leiland Ave., Plainfield, N.J.—A  
 Conn Ltd., C. G., Elkhart, Ind.—A  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—A,B  
 Dage Electronics Corp., 69 N. 2 St., Beech Grove, Ind.—E  
 Daven Co., 191 Central Ave., Newark 4, N.J.—A  
 Decade Instrument Co., Box 153, Caldwell, N.J.—A,B,D,E  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—A,C  
 Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—A,B  
 Electronic Measurements Corp., 280 Lafayette St., New York 12, N.Y.—A,B,E  
 Elk Electronic Labs., 333 W. 52 St., New York 19, N.Y.—A,B  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—A  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—A  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—B  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,B  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D  
 Federal Mfg. & Eng'g. Corp., 199 Steuben St., Brooklyn 5, N.Y.—B  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,B,E  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—A  
 Galbraith & Son, 450 6 Ave., New York 11, N.Y.—A  
 Gaskins Co., 1005 S. Auroraway, Wheaton, Ill.—D  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—A  
 General Electrosonics, Inc., 32 W. 22 St., New York 10, N.Y.—D  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,B,C,D  
 Geotronics Labs., Inc., 1314 Cedar Hill Ave., Dallas 11, Texas—C  
 GERTSCH PRODUCTS, 11846 Miss. Ave., Los Angeles, Calif.—B  
 G & M Equipment Co., 7315 Varna Ave., North Hollywood, Calif.—A,B,D,E,F  
 Granco Products, Inc., 36-17 20 Ave., Long Island City 5, N.Y.—B



Greene Co., L. Charlton, 314 Washington St., Newton 58, Mass.—A  
 GULTON MFG. CORP., Metuchen, N.J.—D  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—A,B  
 HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—A,B,E  
 Huggins Labs., 700 Hamilton Ave., Menlo Park, Calif.—B  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—A  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—A,B,C,D  
 Int'l. Research Assoc., 2221 Warwick Ave., Santa Monica, Calif.—A,B  
 Jackson Electrical Instrument Co., 18 S. Patterson Blvd., Dayton 1, Ohio—A,B,E  
 Johnson Laboratories, Div. of Aladdin Industries, Inc., Willard Rd., Norwalk, Conn.—B  
 KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N.J.—B,D,E  
 Krohn-Hite Instrument Co., 580 Mass. Ave., Cambridge 39, Mass.—B  
 Laboratory for Electronics, 75 Pitts St., Boston, Mass.—B  
 Lux Industries, Inc., 38 Argyle Park, Buffalo 22, N.Y.—B  
 Lynmar Engineers, 1432 N. Carlisle St., Philadelphia 21, Pa.—B  
 Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.—D  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—B  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—A,B  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—A,B,C,D  
 MEASUREMENTS CORP., Boonton, N.J.—B  
 Mercury Electronic Co., Box 450, Red Bank, N.J.—A,B,C,D  
 Metropolitan Electronics & Instruments Co., 106 5 Ave., New York 11, N.Y.—A,B  
 Microtran Co. Div. Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach 93, N.Y.—B  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—B  
 Miller Co., J. W., 5917 S. Main St., Los Angeles 3, Calif.—B  
 Philamon Labs., Inc., 5717 3 Ave., Brooklyn 20, N.Y.—C  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—D  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—F  
 Precise Development Corp., 999 Long Beach Rd., Oceanside, L.I., N.Y.—A,B  
 Precision Associates, 354 Cumberland St., Brooklyn 17, N.Y.—A  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—B,D  
 Pulse Techniques, Inc., 1411 Palisade Ave., W. Englewood, N.J.—A  
 Radex Corp., 2076 Elston Ave., Chicago 14, Ill.—A  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—A,B,E  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., ENG'G. PRODUCTS DIV., Camden 2, N.J.—A  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—E  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—B,D  
 Rich-Roth Labs., 1240 Main St., Hartford 3, Conn.—D  
 Riverbank Labs., Batavia Ave., P. O. Box 65, Geneva, Ill.—C  
 Selector Industries, 401 E. 138 St., New York 54, N.Y.—A,B  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—A  
 Sparton Radio-TV, 2400 E. Ganson St., Jackson, Mich.—B  
 Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—A  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—B  
 Supreme, Inc., Greenwood, Miss.—A,B,E  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—A  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—E,F  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—B  
 Teletronics Lab., 54 Kinkel St., Westbury, L.I., N.Y.—A,D  
 TEL-INSTRUMENT CO., 50 Patterson Ave., East Rutherford, N.J.—B  
 Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—B  
 Triumph Mfg. Co., 913 W. Van Buren, Chicago 7, Ill.—A  
 Ultrasonic Engineering Co., P. O. Box 46, Maywood, Ill.—D  
 Varian Assoc., 990 Varian St., San Carlos 1, Calif.—B

VECTRON, INC., 400 Main St., Waltham 54, Mass.—A,B  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—F  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—A  
 Waveline, Inc., Caldwell, N.J.—B  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—B  
 Weston Labs. Inc., Oak Hill Rd., Harvard, Mass.—A,B  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—A  
 Wunderlich Radio Co., 2 Fifth Ave., New York 11, N.Y.—B

#### 45—MEASUREMENT & TEST EQUIPMENT— OSCILLOGRAPHS

Oscillographs, cathode-ray .....A  
 Oscillographs, direct writing .....B  
 Oscillographs, portable .....C  
 Oscillographs, recording .....D

Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—B,C,D  
 Authorized Mfrs. Service, 155 Spencer St., Brooklyn 5, N.Y.—D  
 Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—A,C  
 BENDIX AVIATION CORP., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif.—B  
 Benson-Lehnor Corp., 2340 Sawtelle Blvd., Los Angeles 64, Calif.  
 BERKELEY SCIENTIFIC CORP., 2200 Wright Ave., Richmond, Calif.—B  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,B,D  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A  
 Browning Labs. Inc., 750 Main St., Winchester, Mass.—A  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—B,C  
 Cambridge Instrument Co., Grand Central Terminal, New York 17, N.Y.—A  
 Central Research Labs. Inc., Red Wing, Minn.—A,B,D  
 Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.—A,D  
 Century Geophysical Corp., Tulsa, Okla.—D  
 Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—D  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—C,D  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—A  
 DUMONT LABS. INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—A,C  
 DUMONT LABS., INC., ALLEN B., 2 Main Ave., Passaic, N.J.—A,C  
 DX RADIO PRODUCTS, 2300 W. Armitage Ave., Chicago 47, Ill.—A  
 Edin Co., 207 Main St., Worcester 8, Mass.—B,C,D  
 Electro-Medical Lab. Inc., South Woodstock, Vt.—B  
 Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—A  
 Electronic Measurements Corp., 280 Lafayette St., New York 12, N.Y.—A  
 Electronic Systems Co., 578 E. 161 St., New York 56, N.Y.—A  
 Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—A  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—A  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—A  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,C  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—A,D  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—A,C  
 General Electrosonics, Inc., 32 W. 22 St., New York 10, N.Y.—A  
 G & M Equipment Co., 7315 Varna Ave., N. Hollywood, Calif.—A  
 Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.—B  
 Heiland Research Corp., 130 E. 5 Ave., Denver 9, Colo.—A,B,C,D  
 HICKOK ELEC. INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—A  
 Hycon Mfg. Co., 2961 E. Colo. Blvd., Pasadena 8, Calif.—A  
 Industrial Television, 369 Lexington Ave., Clifton, N.J.—A  
 Int'l. Electronics Corp., 137 Hudson St., New York 13, N.Y.—A  
 Jackson Elect. Instrument Co., 18 S. Patterson Blvd., Dayton 1, Ohio—A  
 KAY ELECTRIC CO., 14 Maple St., Pine Brook, N.J.—A  
 Lab. for Electronics, Inc., 75 Pitts St., Boston, Mass.—A  
 Lavoie Labs., Inc., Morganville, N.J.—A,B  
 Maurer, Inc., J. A., 37-01 31 St., Long Island City 1, N.Y.—D

Midwestern Geophysical Labs., 3401 S. Harvard, Tulsa, Okla.—C,D  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—A  
 Minn.-Honeywell Regulator Co., Industrial Div., 4428 Wayne Ave., Phila. 44, Pa.—B  
 Offner Electronics, Inc., 5320 N. Kedzie Ave., Chicago 25, Ill.—B,D  
 Panoramic Radio Products, 10 S. 2 Ave., Mount Vernon, N.Y.—A  
 Photon Instrument Co., 6516 Detroit Ave., Cleveland 2, Ohio—B,D  
 Precise Development Corp., 999 Long Beach Rd., Oceanside, N.Y.—A  
 Precise Measurements Co., 942 Kings H'way, Brooklyn 23, N.Y.—B  
 Precision Apparatus Co., 92-27 Horace Harding Blvd., Elmhurst, N.Y.—A,B  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—A,C  
 RADIO CORP. OF AMERICA, RCA TUBE DEPT., 415 S. 5 St., Harrison, N.J.—A  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., ENG'G. PRODUCTS DIV., Camden 2, N.J.—A  
 Rolab Studios, Walnut Tree Hill, Sandy Hook, Conn.  
 Sanborn Co., Cambridge 39, Mass.—B  
 Sigma Instruments, 62 Pearl St., Boston, Mass.—B  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—A  
 Sound Apparatus Co., Stirling, N.J.—B  
 Southwestern Indust. Electronics Co., 2831 Post Oak Rd., Houston, Texas.—C,D  
 Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—A  
 Supreme, Inc., Greenwood, Miss.—A  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—A  
 Syntronic Instruments, Inc., 100 Industrial Rd., Addison, Ill.—A  
 Textronix, Inc., Box 831, Portland 7, Ore.—A  
 Telechrome, Inc., 88 Merrick Rd., Amityville, L.I., N.Y.—A  
 Telecomputing Corp., Burbank, Calif.—B  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,B,C,D  
 Tinker & Razor, P. O. Box 281, San Gabriel, Calif.—A  
 Triplett Electri. Instrument Co., Harmon Rd., Bluffton, Ohio—A  
 Triumph Mfg. Co., 913 W. Van Buren, Chicago 7, Ill.—A  
 WATERMAN PRODUCTS CO., 2445 Emerald St., Philadelphia 25, Pa.—A,B,C  
 Westinghouse Electric Corp., Pittsburgh 30, Pa.—D  
 Weston Lab's, Inc., Oak Hill Rd., Harvard, Mass.—A

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—B,C,D  
 Baughman Co., E. J., 350 S. Central, Los Angeles 13, Calif.—A,B  
 Beta Electric Corp., 333 E. 103 St., New York 29, N.Y.—A,B,C,D  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—C  
 Booth Co., A, E., E., 265 S. Alexandria Ave., Los Angeles 4, Calif.—A,B,D  
 Bracke-Seib X-Ray Co., 293 3 Ave., New York 10, N.Y.—A,B,C  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—B,C,D  
 Burroughs Adding Machine Co., 511 N. Broad St., Philadelphia 23, Pa.—C  
 Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—A,B,C  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—A,B,C,D  
 C.G.S. Lab's Inc., 391 Ludlow St., Stamford, Conn.—D  
 Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—B,C,D  
 CINEMA ENGINEERING CO., DIV. AEROVOX CORP., 1510 W. Verdugo Ave., Burbank, Calif.—B  
 Communication Measurements Lab. Inc., 350 Leland Ave., Plainfield, N.J.—C,E  
 Computer Corp. of America, 149 Church St., New York 7, N.Y.—B,C,D  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—A,B,C,D  
 Consolidated Engineering Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—D  
 Curtis Wright Corp., Electronics Div., 631 Central Ave., Carlstadt, N. J.—A,B,D  
 Diatron Co., 3327 Dixie Dr., Houston 21, Texas—A,B,C,D,E  
 Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—A,C,D  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—A,B,C,D,E  
 DUMONT LABS, INC., ALLEN B., INSTRUMENT DIV., 750 Bloomfield Ave., Clifton, N.J.—D  
 Eastgag Co., 285 Columbus Ave., Boston 16, Mass.—C  
 Edin Co., 207 Main St., Worcester 8, Mass.—D  
 Eldico of N.Y. Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—A,B,C,D  
 Electronic Measurements Co., Lewis St. & Maple Ave., Eatontown, N.J.—B,C,D  
 Electronic Research Co., 11550-39 N.E., Seattle 55, Wash.—B,C,D  
 ELECTRO PRODUCTS LAB'S., INC., 4501 N. Ravenswood Ave., Chicago, Ill.—B,D  
 Electro-Tech Equipment Co., 308 Canal St., New York, N.Y.—B,C

El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—A,B,C,D  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A,B,C,E  
 Empire Devices, Inc., 3825 Bell Blvd., Bayside 61, N.Y.—C  
 Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio—D  
 Engineering Research & Development Co., Addison, Ill.—A,B,C,D  
 Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, R.I.—A,B,C,D  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,B,C  
 Espy Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D,E  
 Federal Mfg. & Eng'g. Corp., 199 Steuben St., Brooklyn 5, N.Y.—A,D  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—B,C  
 Fluke Engineering Co., John, 1111 W. Nicker-son St., Seattle 99, Wash.—A,B,C,D,E  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—A,B,D  
 Furst Electronics, 3322 W. Lawrence Ave., Chicago 25, Ill.—A,B,C,D,E  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—A,B,C,D  
 Galbraith & Son, 450 6 Ave., New York 11, N.Y.—B,C  
 Galvanic Products Corp., 110 E. Hawthorne Ave., Valley Stream, N.Y.—B  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—B,C,D  
 General Communications, Box 169, Fort Atkinson, Wisc.—B,C,D  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—A,B,C,E  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—B,C,D  
 General Electrosonics, Inc., 32 W. 22 St., New York 10, N.Y.—A,B,C,D,E  
 General Hermetic Sealing Corp., 99 E. Hawthorne, Valley Stream, N.Y.—A,B,C,D,E  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A  
 G & M Equipment Co., 7315 Varna Ave., N. Hollywood, Calif.—A,B,C,D,E  
 G.W. Associates, P. O. Box 2263, El Segundo, Calif.—C,D  
 Hastings Instrument Co., Superhighway at Pine Ave., Hampton, Va.—C  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—B,C  
 Heyer Products Co., 471 Cortlandt St., Belleville 9, N.J.—B,D  
 Hindle Transformer Co., Flemington, N.J.—D  
 HI-Q DIV., AEROVOX CORP., Olean, N.Y.—B,C  
 Hull & Co., R. O., 1300 Parsons Ct., Rocky River, Ohio—B,D  
 Industrial Electronics Co., Hanover St., Hanover, Mass.—A,B,C,D  
 Industrial Transformer, Gouldsboro, Pa.—A,B,C  
 Inet, Inc., 8655 S. Main St., Los Angeles 3, Calif.—A,B,C,D,E  
 Interelectronics Corp., 2432 Grand Concourse, Bronx 58, N.Y.—A,B,C,D,E  
 Int'l. Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—C,D,E  
 Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass.—D  
 Kalbfell Labs., Inc., 1090 Marena Blvd., San Diego 20, Calif.—C,D  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—C  
 Kepco Lab., 131-8 Sanford Ave., Flushing 55, N.Y.—A,B,C,D  
 Kinevov Inc., 116 S. Hollywood Way, Burbank, Calif.  
 Lab. for Electronics, Inc., 75 Pitts St., Boston, Mass.—B,D  
 Lambda Electronics Corp., 103-02 Northern Blvd., Corona 68, N.Y.—A,B,C,D  
 Lawn Electronics Co., Freehold, N.J.—C  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—B  
 Leeds Northrup, 4979 Stanton Ave., Philadelphia 44, Pa.—B  
 Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—D  
 Lynmar Engineers, 1432 N. Carlisle St., Philadelphia 21, Pa.—C,D  
 McColpin-Christie Corp., 3410 W. 67 St., Los Angeles 43, Calif.—B,C  
 MacLeon & Hanopol, Inc., 10 Roland St., Charlestown 29, Mass.—D  
 Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y.—C,D  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,B,C,D  
 MALLORY & CO., P.R., 3029 E. Washington St., Indianapolis 6, Ind.—B,C,D  
 Manson Labs, 207 Greenwich Ave., Stamford, Conn.—B,C,D  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—A,B,C,E  
 Marion Electrical Instrument Co., 401 Canal St., Manchester, N.H.—B  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—A,B,C  
 Menlo Research Lab., P. O. Box 522, Menlo Park, Calif.—D  
 Mercury Electronic Co., Box 450, Red Bank, N.J.—A,B,C,D,E  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—B  
 Mission-Western Engineers Inc., 132 W. Colo. St., Pasadena 1, Calif.—A,B,C,D,E

**46—MEASUREMENT & TEST EQUIPMENT—POWER SUPPLIES**

- Power supplies, AC .....A
- Power supplies, DC .....B
- Power supplies, regulated .....C
- Power supplies, special purpose . . .D
- Power supplies, variable frequency E

Accurate Eng'g. Co., 2005 Blue Island Ave., Chicago 8, Ill.—B,C,D  
 Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—A,B,C,D,E  
 Acorn Electronics Corp., Box 348, Gibson City, Ill.—A,B  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—D  
 AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—B,C  
 Ahrendt Instrument Co., 4910 Calvert Rd., College Park, Md.—B,C,D  
 Airpax Products Co., P. O. Box 137, Baltimore 2, Md.—A,B,C,E  
 ALCO ELECTRONICS MFG. CO., 102 Marston St., Lawrence, Mass.—A,B,C,D,E  
 Allied Allegri Machine Co., 141 River Rd., Nutley 10, N.J.—B,C  
 Allied Eng'g. Div., Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—D  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—B,C,D  
 American Electroneering Corp., 2040 Colo. Ave., Santa Monica, Calif.—A,C,D,E  
 American Time Products, 580 5 Ave., New York 36, N.Y.—C  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—A,B,C  
 Anton Electronic Lab's., 1226 T Flushing Ave., Brooklyn 37, N.Y.—C,D  
 Applegate & Co., C. J., 1816 Grove St., Boulder, Colo.—B,C,D  
 Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—A,B  
 Assoc. Specialties, 1751 Main St., Orefield, Pa.—B  
 Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, N.Y.—A,B,C,D  
 Atomlab, Inc., 489 5 Ave., New York 17, N.Y.—B,C,D  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—C,D  
 Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—A,B,C

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**THE 1953 ELECTRONIC INDUSTRIES DIRECTORY**

contains

**THE MOST UP-TO-DATE LIST OF MANUFACTURERS?**

Lists thousands of manufacturers in the electronic and allied industries—about a thousand more than in the next best directory listing. A great many manufacturers are listed for the first time in any directory—thanks to the tireless field investigations and constant scrutiny of new firms by the editors of TELE-TECH.



Moulic Specialties Co., 1005 W. Washington St., Bloomington, Ill.—B,C,D  
 Multi-Amp, 121 Cross, Harrison, N.J.—A,B,D  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—C,D  
 National Spectrographic Labs., Nat'l. Spectrographic Sales Corp., 6300 Euclid Ave., Cleveland 3, Ohio—A,B,C,D  
 Nestor Eng'g. Co., 24 Chestnut St., Rutherford, N.J.—B  
 Neutronic Associates, 83-56 Vietor Ave., Elmhurst 73, N.Y.—B,C,D,E  
 North American Philips Co., 750 S. Fulton Ave., Mt. Vernon, N.Y.—B  
 Northeastern Eng'g. Corp., So. Bedford St., Manchester, N.H.—A,B,C,D  
 Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill.—B,C  
 Nuclear Measurements, 2460 N. Arlington Ave., Indianapolis 18, Ind.—C  
 Nuclear Research Corp., 2563 Grays Ferry Ave., Philadelphia 46, Pa.—C  
 Nucleonic Co. of America, 497 Union St., Brooklyn 31, N.Y.—B,C,D  
 Opad-Green Co., 71 Warren St., New York 7, N.Y.—B,C,D  
 Oregon Electronic Mfg. Co., 2232 E. Burnside St., Portland 15, Ore.—A,B,C  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—A,B,C,D  
 Oster Mfg. Co., John, 1 Main St., Racine, Wis.—A,B,E  
 Owen Labs., 412 Woodward Blvd., Pasadena 10, Calif.—B,C,D  
 P C A Electronics Inc., 2180 Colorado Ave., Santa Monica, Calif.—B  
 Perkin Eng'g. Corp., 345 Kansas St., El Segundo, Calif.—B,C,D  
 Peschel Electronics Inc., 13 Garden St., New Rochelle, N.Y.—A,B,C,D  
 Philbrick Researches Inc., Geo. A., 230 Congress St., Boston 10, Mass.—B,C,D  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—D  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—A,B  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—B,C,D  
 POLYTECHNIC RESEARCH & DEVELOP. Co., 55 Johnson St., Brooklyn 1, N.Y.—B  
 Precise Measurements Co., 942 Kings Hwy., Brooklyn 23, N.Y.—A,B,C,D  
 Precision Associates, 354 Cumberland St., Brooklyn 17, N.Y.—A,B  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—B,C,E  
 Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N.Y.—C,D  
 Radar-Electronics Inc., 229 W. 28 St., New York 1, N.Y.—A,B,C,D  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., ENG'G. PRODUCTS DIV., Camden 2, N.J.—A,B,C  
 Radiation Inc., Melbourne, Fla.—C,D  
 Regulator Eng'g. & Devel. Co., 11545 W. Jefferson Blvd., Culver City, Calif.—B,C,D  
 Resdel Eng'r., 2351 Riverside Dr., Los Angeles 39, Calif.—A,B,C,D,E  
 Research Electronics Labs., Roslyn, Pa.—B,C,D  
 Rich Electronics Inc., 212 N.W. 8 Ave., Miami 36, Fla.—B,C,D  
 Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—C  
 Rutishauser Corp., 490 S. Fair Oaks Ave., Pasadena 1, Calif.—B  
 Schauer Mfg. Corp., 4500 Alpine Ave., Cincinnati 36, Ohio—B,C,D  
 Scientific Specialties Corp., Snow & Union St., Brighton 35, Mass.—B,C  
 Scott Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—B  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—B,D  
 Selector Industries Inc., 401 E. 138 St., New York 54, N.Y.—A,B,C  
 Servo Corp. of America, 2020 Jericho Tpke., New Hyde Park, L.I., N.Y.—D  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—B,D  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—D  
 Sola Electric Co., 4633 W. 16 St., Chicago 50, Ill.—A,C,D  
 Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.—A,B,C,D,E  
 Southwestern Industr. Electronics Co., 2831 Post Oak Rd., Houston, Tex.—A,B,C,D,E  
 Spellman Television Co., 3029 Webster Ave., Bronx 67, N.Y.—B,C,D  
 Spera Electronics Labs., 37-10 33 St., Long Island City, N.Y.—A,B,C,D  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—C  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A,B,C,D,E  
 Sparton Radio Television, 2400 E. Ganson St., Jackson, Mich.—B,D  
 Sticht Co., Herman H., 27 Park Pl., New York 7, N.Y.—B  
 Superior Electric Co., 83 Laurel St., Bristol, Conn.—A,B  
 Syntonic Instruments, Inc., 100 Industrial Rd., Addison, Ill.—B,C,D  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B  
 Techno Instrument Co., 6666 Lexington Ave., Los Angeles 38, Calif.—C  
 TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—B,C,D  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—A,B,D

# ELECTRONIC INDUSTRIES DIRECTORY

Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—C  
 Teletronics Lab., 54 Kinkel St., Westbury, L.I., N.Y.—A,D  
 TEL-INSTRUMENT CO., 50 Patterson Ave., E. Rutherford, N.J.—C  
 Tracerlab, Inc., 130 High St., Boston 10, Mass.—C  
 Transformer Technicians Inc., 2608 N. Cicero Ave., Chicago 39, Ill.—A,B,D  
 Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—A,B,C,D,E  
 Triumph Mfg. Co., 913 W. Van Buren, Chicago 7, Ill.—C  
 Universal Electronics Co., 2012 S. Sepulveda Blvd., Los Angeles 25, Calif.—B,C,D  
 U. S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—A,D,E  
 Varian Associates, 990 Varian St., San Carlos, Calif.—C,D  
 VECTRON INC., 400 Main St., Waltham 54, Mass.—D  
 Vickers Electric Div., Vickers Inc., 1835 Locust St., St. Louis 3, Mo.—C  
 Weston Labs. Inc., Oak Hill Rd., Harvard, Mass.—A,B,C,D  
 Wilkor Div., Aerovox Corp., 2882 Detroit Ave., Cleveland 13, Ohio—B,C  
 Willys-Overland Motors, Inc., Electronics Div., 6225 Benore Rd., Toledo, Ohio—A,B,C,D

## 47—MEASUREMENT & TEST EQUIPMENT—SPECIAL PURPOSE

Attenuators, A-F	A
Attenuators, logarithmic	B
Attenuators, R-F	C
Barreters	D
Bolometers	E
Cabinets, temperature test	F
Calibrators	G
Cameras, oscilloscope recording	H
Chronographs	I
Comparators	J
Color equipment	M
Converters, frequency	K
Delay lines	L
Filters	T
Frequency measuring equipment	N
Integrators	U
Instrument parts	V
Inverters	W
Lenses	X
Lights, neon test	Y
Locators, interference	Z
Microwave test equipment	AO
Multivibrators	AB
Optical equipment	O
Pressure measuring equipment	P
Probes	AC
Recorders, frequency response	AD
Regulators	AE
Screen rooms	AF
Specialties, capacitor	AG
Specialties, inductance	AH
Specialties, resistance	AI
Spectrographic equipment	Q
Spring testing equipment	R
Stroboscopes	AJ
Synchrosopes	AK
Thermocouples	AL
Tracers, signal	AM
Tuning forks	AN
Vibration measuring equipment	S

Ace Eng'g. & Machine Co., 3644 N. Lawrence St., Philadelphia 40, Pa.—AF  
 Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—K,L,T  
 Acme Industrial Co., 200 N. Laffin St., Chicago 7, Ill.—O  
 Acme Scientific Co., 1450 W. Randolph St., Chicago 7, Ill.—M  
 Acro Transformer & Mfg. Corp., 26-02 4 St., Long Island City 2, N.Y.—T  
 Advance Electronics Co., P. O. Box 394, Passaic, N.J.—L  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—I,J,F,S  
 Aerolux Light Corp., 653 11 Ave., New York 36, N.Y.—O,Y,AJ

AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—L,T,AI  
 Affiliated Photographic Co., 21 W. 45 St., New York 19, N.Y.—O  
 AIRTRON, INC., 1109 W. Elizabeth Ave., Linden, N.J.—AL  
 Airtronix Development Corp., 20 W. 22 St., New York 10, N.Y.—AE  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass.—L,Y  
 Amalgamated Electronics, Clinton Corners, N.Y.—AI  
 American Electroneering Corp., 2040 Colorado Ave., Santa Monica, Calif.—C,G,N,AB  
 American Instrument Co., Silver Spring, Md.—F  
 American Optical Co., Buffalo 15, N.Y.—M,O,Q,X  
 American Radio Hardware Co., 152 MacQueston Parkway S., Mount Vernon, N.Y.—AC  
 American Thermo-Electric Co., 198-11 Hollis Ave., Hollis 12, N.Y.—AK  
 American Time Products, Inc., 580 5 Ave., New York 36, N.Y.—I,AN  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—T,AE  
 Anderson Labs., Inc., 39 Talcott Rd., W. Hartford 10, Conn.—B,L,U  
 Anton Electronic Labs., 1226 T. Flushing Ave., Brooklyn 37, N.Y.—AE  
 Applegate & Co., C. J., 1816 Grove St., Boulder Colo.—AE  
 Applied Physics Corp., 362 W. Colorado St., Pasadena 1, Calif.—Q  
 Arenberg Ultrasonic Lab., 94 Green St., Jamaica Plain 30, Mass.—U  
 Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—A,I,J  
 Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—B  
 Audio-Tone Oscillator Co., 6511 Main St., Long Hill, Conn.—M,AD  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—H,K,L,S,AD  
 Austin Co., Special Devices Div., 76 9 Ave., New York 11, N.Y.—U  
 Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—Y,AJ  
 Bache & Co., Semon, 636 Greenwich St., New York 14, N.Y.—X  
 Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio—U  
 Baird Associates, Inc., 33 University Rd., Cambridge 38, Mass.—Q  
 Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.—F,G,R,S  
 Ballantine Labs., Inc., 100 Fanny Rd., Boonton, N.J.—W  
 Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—K,L,N,T  
 Bar-Ray Products, Inc., 209 25 St., Brooklyn 32, N.Y.—N  
 Bassett, Inc., Rex, 1314 N.E. 17 Ct., Fort Lauderdale, Fla.—F,N  
 Batson Electronics Corp., J. A., 1031 S. 27 St., Omaha, Nebr.—Y,AC  
 Bausch & Lomb Optical Co., 628 St. Paul St., Rochester, N. Y.—J,O,Q,X  
 Bayside Watch Tool Co., 20-02 Utopia Parkway, Whitestone 57, N.Y.—V  
 Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—AK,AL  
 Beckman & Whitley, Inc., 985 San Carlos Ave., San Carlos, Calif.—Q  
 Benson-Lehner Corp., 2340 Sawtelle Blvd., Los Angeles 64, Calif.—G  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, INC., 2200 Wright Ave., Richmond 3, Calif.—K,N,AA,AD,AO  
 Berkshire Labs., 586 Beaver Pond Rd., Lincoln, Mass.—AJ  
 BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa.—L  
 BLONDER-TONGUE LABS., INC., 526 North Ave., E. Westfield, N.J.—C  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—A,D,E,N,T,AB,AC,AK,AO  
 BOONTON RADIO CORP., Intervale Rd., Boonton, N.J.—K,AO  
 Borden Eng'g. Co., 63 Clinton Ave., New Providence, N.J.—J,AI  
 Bourns Labs., 6135 Magnolia Ave., Riverside, Calif.—P  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—O,V,AN  
 Bowser Tech. Refrigeration, Div. Bowser Inc., Terryville, Conn.—F  
 Bram Chemical Co., 820-65 Ave., Philadelphia 26, Pa.—AL  
 BREW & CO., RICHARD D., 106 Concord Ave., Belmont 78, Mass.—L  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,C,D,E,G,L,M,T,U,AA,AB,AD,AE,AH,AI,AK,AM  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—N, AG  
 Browning Labs., Inc., 750 Main St., Winchester, Mass.—G,N,AE,AK,AO  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—N,S,T,AD  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—N  
 Buhl Optical Co., 1009 Beech Ave., Pittsburgh 12, Pa.—O,X  
 Bunnell & Co., J., 81 Prospect St., Brooklyn 1, N.Y.—AN  
 BURKE & JAMES, INC., 321 S. Wabash Ave., Chicago 4, Ill.—H,O,X  
 Burnell & Co., 45 Warburton Ave., Yonkers, N.Y.—T  
 BURROUGHS ADDING MACHINE CO., 511 N. Broad St., Philadelphia 23, Pa.—AB



Calidyne Co., 751 Main St., Winchester, Mass.—G,S  
Carad Corp., 93 Leland Ave., San Francisco 23, Calif.—L,T  
Carlson & Nicholson Inc., 497 Maynard Dr., Buffalo 21, N.Y.—J  
CARTER MOTOR CO., 2644 N. Maplewood Ave., Chicago 47, Ill.—W  
Central Eng'g. Corp., 560 Providence Highway, Norwood, Mass.—P  
Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.—Q,AN  
Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—G,H,O P, S,AB,AN  
CENTURY METALCRAFT CORP., 14806 Oxnard St., Van Nuys, Calif.—Q  
C.G.S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—L  
CINEMA ENG'G. CO., Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—A,T  
Citation Products Co., 233 E. 146 St., New York 51, N.Y.—V  
Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—K,N  
Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—K,N,P,AD  
Coast Coil Co., 5352 W. Wash. Blvd., Los Angeles 16, Calif.—T  
Coil Winders, Inc., New York Ave., Westbury, L.I., N.Y.—T, AI  
Cole Instrument Co., 1320 S. Grand Ave., Los Angeles, Calif.  
Collins Radio Co., Cedar Rapids, Iowa—T  
Colortone Television Co., 238 William St., New York 38, N.Y.—N  
Columbia Technical Corp., 5 E. 57 St., New York 22, N.Y.—L  
Commercial Radio Monitoring Co., P. O. Box 7037, Kansas City, Mo.—G,N  
Communication Accessories Co., Hickman Mills, Mo.—T  
Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J.—K,AJ  
Computer Corp. of America, 149 Church St., New York 7, N.Y.—G,U  
Conant Labs., 6500 "O" St., Lincoln 5, Nebr.—V  
Conn Ltd., C. G., Elkhart, Ind.—N  
Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—K,T  
Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—G,P,Q,S  
CONTROL ENG'G., 560 Providence Highway, Norwood, Mass.—P  
Cosa Corp., 405 Lexington Ave., New York 17, N.Y.—J  
Costelow Co., John A. 125 Kansas Ave., Topeka, Kan.—A,B,C  
Cubic Corp., 2841 Canon St., San Diego 6, Calif.—D,E  
Custom Electronics Corp., 738 Speedwell Ave., Morris Plains, N.J.—G  
Dallons Labs., 5066 Santa Monica Blvd., Los Angeles 29, Calif.—P  
Dalmo Victor Co., 1414 El Camino Real, San Carlos, Calif.—AO  
Dante Electric Mfg. Co., P. O. Box 6, Bantam, Conn.—Y  
Daven Co., 191 Central Ave., Newark 4, N.J.—A,B,C,V,AI  
Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md.—S,U  
Deagan, Inc., J. C., 1770 W. Berteau Ave., Chicago 13, Ill.—N,S,AN  
Decade Instrument Co., Box 153, Caldwell, N.J.—N  
DeCoursey Eng'r. Lab., P. O. Box 235, Los Angeles 25, Calif.—T  
Delaware Optical Labs., 36 Williams St., Fernwood, Pa.—H,I,M,O,Q,V,X  
DeMornay-Bonardi, 3225 Burton Ave., Burbank, Calif.—C,N,AO  
DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—G,K  
Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—C,N  
Diatron Co., 3327 Dixie Dr., Houston 21, Texas—P  
Dice Co., J. W., 1 Engle St., Englewood, N.J.—J  
Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—G,I,N,AB  
Dillon & Co., W. C., 14620 Keswick St., Van Nuys, Calif.—R  
DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.—G,J  
Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—W,AD  
Dubrow Development Co., 235 Penn St., Burlington, N.J.—A,B,C,J,N,T,AM  
DUMONT LABS., INC., Allen B., Instrument Div., 760 Bloomfield Ave., Clifton, N.J.—G,H,L,AC,AK  
DUMONT LABS., INC., ALLEN B. 750 Bloomfield Ave., Clifton, N.J.—G,H,L,Q, AB,AC,AK  
DUMONT LABS., INC., Allen B., 2 Main Ave., Passaic, N.J.—H,N  
DX RADIO PRODUCTS CO., 2300 W. Armistage Ave., Chicago 17, Ill.—AM  
Eastern Specialty Co., 3617 N. 8 St., Philadelphia 40, Pa.—V  
Eldi Electronic Devices, 204 W. Houston St., New York 14, N.Y.—AC  
Eldico of N.Y., Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—T,Z  
Electric Design & Mfg. Co., Jefferson St., Burlington, Iowa—V  
Electric Eye Equipment Co., 6 W. Fairchild St., Danville, Ill.—AJ  
Electric regulator Corp., Pearl St., Norwalk, Conn.—AE  
Electrodyne Co., Endicott St., Norwood, Mass.—H  
Electro-Mec Lab., 19 Murray St., New York 7, N.Y.—G,AI  
Electro-Mechanical Research Inc., 64 Main St., Ridgefield, Conn.—G  
Electro-Medical Lab., Inc., South Woodstock, Vt.—I  
Electronic Devices Inc., 429 12 St., Brooklyn 15, N.Y.  
Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—AC,AM  
Electronic Systems Co., 578 E. 161 St., New York 56, N.Y.—L,T  
Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—H,P  
Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—A,B,C,AL  
Electro-Physics Co., 287 Broadway, New York 7, N.Y.—M  
ELECTRO-PRODUCTS LABS., INC., 4501 N. Ravenswood Ave., Chicago, Ill.—P  
Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—S,Y,AE,AL  
Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—AK  
Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—A,B,L,T,AH  
Elk Electronic Labs., Inc., 333 W. 52 St., New York 19, N.Y.—A,C  
Ellison Draft Gage Co., 548 W. Monroe St., Chicago 6, Ill.—P  
Elm Labs., 18 S. Broadway, Dohbs Ferry, N.Y.—N  
El-Rad Mfg. Co., 2800 W. Cullom, Chicago 18, Ill.—AB  
El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—G,I,AB,AC  
Emeloid Co., 1239 Central Ave., Hillside, N.J.—X  
Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—C,AB,AE  
Empire Devices, Inc., 38-25 Bell Blvd., Bayside 61, N.Y.—C,Z  
Empire State Labs. 2608 Merrick Rd., Bellmore, L.I., N.Y.—L,T  
Eng'g. Associates, 434 Patterson Rd., Dayton 9, Ohio—N,AK  
Eng'g. Research Associates, Inc., Div. Remington Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—L  
Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill.—O  
Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,B,C,G,N,T,AA,AF  
Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,G,K,L,N,P,T,AB,AC,AD,AK, AM,AN  
Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.—P  
FAIRCHILD CAMERA & INSTRUMENT CORP., (Potentiometer Div.), Robbins Lane, Syosset, L.I., N.Y.—H  
Federal Mfg. & Eng'g. Co., 199 Steuben St., Brooklyn 5, N.Y.—N  
Federal Telecommunication Labs., 500 Washington Pl. Nutley, N.J.—AO  
FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—A,B  
Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,C,G,H,AC,AG,AI,AK, AM  
Ferris Instrument Co., 110 Cornelia St., Boonton, N.J.—G,AO  
Field Electrical Instrument Co., 8 N. Manheim Blvd., New Paltz, N.Y.—N,AL  
Fish-Schurman Corp., 70 Portman Rd., New Rochelle, N.Y.—M,T  
Flett Laboratory, 3711 Marshall Rd., Drexel Hill, Pa.—O  
Foxboro Co., 38 Neponset Ave., Foxboro, Mass.—P,AL  
FRED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—L,T,AH  
Frequency Standards, P. O. Box 504, Asbury Park, N.J.—N  
Gardner Lab., Inc., Henry A., 4723 Elm St., Bethesda 14, Md.—M  
GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—AE  
General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—Y,AC  
GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—K,L,N,O,Q, S,V,W,AJ,AK,AL  
GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—G,N  
GENERAL ELECTRIC CO., Cleveland 12, Ohio—Y  
General Electrosonics, Inc., 32 W. 22 St., New York 10, N.Y.—Z  
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y.—L  
GENERAL PRECISION LAB., INC., 63 Bedford Rd., Pleasantville, N.Y.—C  
GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,C,E,G,H,I,J,N,O,S,T,AA, AJ,AN,AO  
General R-F Fittings Co. 702 Beacon St., Boston 15, Mass.—C,AC  
Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif.—G  
Georator Corp., Manassas, Va.—K  
GERTSCH PRODUCTS INC., 11846 Miss. Ave., Los Angeles 25, Calif.—N,AO  
Gilfillan Bros. 1815 Venice Blvd., Los Angeles 6, Calif.—AO  
G & M Equipment Co., 7315 Varna Ave., Hollywood, Calif.—N,AF,AK  
Gorrell & Gorrell, Haworth, N.J.—V  
Granco Products, Inc., 36-17 20 Ave., Long Island City 5, N.Y.—K,N  
GULTON MFG. CO., Metuchen, N.J.—L,P,S,T, AC,AG  
G. W. Associates, P. O. Box 2263, El Segundo, Calif.—C,G  
Haledy Electronics Co., 57 William St., New York 5, N.Y.—AK  
Hallett Mfg. Co., 1601 W. Florence Ave., Inglewood, Calif.—T  
Hastings Instrument Co., Superhighway at Pine Ave., Hampton, Va.—P,AC,AL  
Heiland Research Corp., 130 E. 5 Ave., Denver 9, Colo.—H  
Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—A,C,N,AA,AO  
HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—G,H, N,V  
HI-Q DIV., AEROVOX CORP., Olean, N.Y.—L,T,AI  
Hoke, Inc., 136 S. Dean St., Englewood, N.J.—P  
Hycor Mfg. Co., 2961 E. Colo. Blvd., Pasadena 8, Calif.—L,AK,AO  
Hycor Co., 11423 Vanowen St., N. Hollywood, Calif.—AH  
Impact-O-Graph Corp., 1900 Euclid Bldg., Cleveland 15, Ohio—S  
Industrial Devices, Edgewater, N.J.—Y  
Industrial Electronics, Inc., 8060 Wheeler St., Detroit 10, Mich.—G  
Industrial Television, 369 Lexington Ave., Clifton, N.J.—AC  
Instrument Development Labs., 163 Highland Ave., Needham Heights 94, Mass.—M,V  
Instrument Labs., 315 W. Walton Pl., Chicago, Ill.—G,AI  
INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City, N.Y.—A,AC,AI,AM  
International Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—C,L,P,T,U  
International Research & Devel. Corp., 1027 W. 5 Ave., Columbus 8, Ohio—S  
Jackson Electrical Instrument Co., 18 S. Patterson Blvd., Dayton 1, Ohio—G  
JAMES KNIGHTS CO., Sandwich, Ill.—N  
Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass.—O,Q,X  
Javex, Box 646, Redlands, Calif.—Y,AC  
J-B-T INSTRUMENTS, 441 Chapel St., New Haven, Conn.—N,AL  
JENNINGS RADIO MFG. CO., P. O. Box 1278, San Jose 8, Calif.—AG  
Jerrold Electronics Corp., 26 & Dickinson Sts., Philadelphia 46, Pa.—C  
Jiffy Clip Mfg. Co., 128 Clinton Ave., Huntington, N.Y.—AC  
KAY ELECTRIC CO., 14 Maple Ave., Pine Brook, N.J.—C,N,X  
KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—A,T  
Kecco Labs., 131 Sanford Ave., Flushing 55, N.Y.—AE  
Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—Y,AC  
Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—N  
Kocour Co., 3504 W. 48 Pl. Chicago 32, Ill.—J  
KOLLSMAN INSTRUMENT CORP., 80-08 45 Ave., Elmhurst 73, N.Y.—O,V  
L.A.B. Corp., 31 Union Pl., Summit, N.J.—S  
Lab. for Electronics, Inc., 75 Pitts St., Boston, Mass.—L  
Lambda Electronics Corp., 103-02 Northern Blvd., Corona 68, N.Y.—AE  
LaMotte Chemical Products Co., Baltimore 4, Md.—J  
Lampkin Labs., Inc., Rt. #1, Bradenton, Fla.—N  
Lavoie Labs., Inc., Morganville, N.J.—G,N,AK  
Lee Electronic Labs., Inc., 233 Dudley St., Boston 19, Mass.—J,Y,AC,AM  
Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—T  
LePace Mfg. Co., 75-19 64th St., Glendale 27, N.Y.—T  
Lerner Instrument & Electronics Mfg. Corp., G P O Box 620, Brooklyn 1, N.Y.—AI  
Lindgren & Associates, 4515 N. Ravenswood Ave., Chicago 40, Ill.—AF  
Linear Equipment Labs., Brightwater Pl., Massapequa, N.Y.—AC  
Litton Eng'g Labs., 1049 Brittan Ave., San Carlos, Calif.—AO  
Loral Electronics Corp., 794 E. 140 St., New York 54, N.Y.—N  
Lynmar Engineers, 1432 N. Carlisle St., Philadelphia 21, Pa.—A,C,K,L  
Lyseo Mfg. Co., 1401 Clinton St., Hoboken, N.J.—K  
MacKenzie Products Co., 141 Brewery St., New Haven, Conn.—L  
Magnafux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.—R  
Magne-Pulse Corp., 140 Nassau St., New York 38, N.Y.—L,AD  
Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y.—AE  
Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—J,O,P,V,AH  
MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—K,W  
Manufacturers Eng'g. & Equip. Corp., York & Mill Rds., Hatboro, Pa.—M  
Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—E,I,N,Q,AO  
Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—V

Massa Labs., Inc., 5 Fottler Rd., Hingham, Mass.—S  
 Master Appliances, Inc., 1600 Factory Ave., Marion, Ohio—Y  
 May Eng'g. Co., 6055 Lankershim Blvd., N. Hollywood, Calif.—L  
 MB Mfg. Co., 1060 State St., New Haven 11, Conn.—G,S  
 MEASUREMENTS CORP., Boonton, N.J.—C,E,G,W,Z,AO  
 Menlo Research Lab., P. O. Box 522, Menlo Park, Calif.—J  
 Mercury Electronic Co., Box 450, Red Bank, N.J.—A,C,AJ,AF  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—P  
 Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.—J  
 Meyer-Opticraft, Inc., 39 W. 60 St., New York 23, N.Y.—O,V,X  
 Microlab, 301 S. Ridgewood Rd., S. Orange, N.J.—C,T  
 MICROWAVE ASSOCIATES, INC., 22 Cummington St., Boston 15, Mass.—C,AO  
 Microwave Devel. Labs. Inc., 22D Grove St., Waltham 54, Mass.—C  
 Mil Instrument Corp., 92-15 172 St., Jamaica 33, N.Y.—AM  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—L,N,AK  
 Miller Co., J. W., 5917 S. Main St., Los Angeles 3, Calif.—L,T  
 MILLIVAC INSTRUMENT CORP., 444 2 St., Schenectady, N.Y.—W,AC  
 Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.—P,AL  
 Moulis Specialties Co., 1005 W. Wash. St., Bloomington, Ill.—AE  
 Murphy & Miller, Inc., 1326 S. Michigan Ave., Chicago 5, Ill.—F  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—L,T  
 National Spectrographic Labs., Inc., 6300 Euclid Ave., Cleveland 3, Ohio—J,O,Q  
 Neomatic, Inc., 9010 Bellanca Ave., Los Angeles 45, Calif.—S  
 Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N.J.—AF  
 New London Instrument Co., P. O. Box 189, New London, Conn.—G,N  
 Norrman Labs., Ernst, Williams Bay, Wis.—N  
 Northeastern Engineering, Manchester, N.H.—N,Q  
 NRK MFG. & ENG. CO., 4601 W. Addison St., Chicago 41, Ill.—AO  
 Oak Ridge Products, Mfg. Div. Video Television, Inc., 92-15 172 St., Jamaica 33, N.Y.—AM  
 Ohmite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill.—A,AI  
 Oregon Electronic Mfg. Co., 2232 E. Burnside St., Portland 15, Ore.—AC  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—A,B,C,T  
 Owen Labs., 412 Woodward Blvd., Pasadena 10, Calif.—G  
 Pacific Transducer Corp., 11921 W. Pico Blvd., Los Angeles 64, Calif.—O,X  
 Pacific Universal Products Corp., 168 Vista Ave., Pasadena 8, Calif.—H,O,X  
 Packard-Bell Co., 12333 W. Olympic Blvd., W. Los Angeles, Calif.—T  
 Pancro Mirrors, Inc., 2958 Los Feliz Blvd., Los Angeles 39, Calif.—X  
 Panoramic Radio Products, 10 S. 2 Ave., Mt. Vernon, N.Y.—AD,AO  
 Pantek Co., 208 42 St., Manhattan Beach, Calif.—AJ  
 P C A Electronics Inc., 2180 Colo. Ave., Santa Monica, Calif.—L  
 Penn Industrial Instrument Corp., 4110 Haverford Ave., Philadelphia 4 Pa.—P  
 Penna Testing Lab., Doylestown, Pa.—AG  
 Perkin Eng'g. Corp., 345 Kansas St., El Segundo, Calif.—AE  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—AI  
 Phila. Scientific Glass Co., 4 Eckard Ave., Abington, Pa.—F  
 Philamon Labs., Inc., 5717 3 Ave., Brooklyn 20, N.Y.—AN  
 Philbrick Researchers, Inc., Geo. A., 230 Congress St., Boston 10, Mass.—U  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—M  
 Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—AC  
 Pickard & Burns, 240 Highland Ave., Needham 94, Mass.—E  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—AC  
 Plastics & Electronics Co., Inc., 272 Northland Ave., Buffalo 8, N.Y.—AI  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—A,C,N,Q,AO  
 Polyphase Instrument Co., 705 Haverford Rd., Bryn Mawr, Pa.—T  
 POLYTECHNIC RESEARCH & DEVEL. CO., 55 Johnson St., Brooklyn 1, N.Y.—C,E,N,Q,AO  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—I,N,AA,AB  
 Praktica Co., 48 W. 29 St., New York 1, N.Y.—H  
 Precise Devel. Corp., 999 Long Beach Rd., Oceanside, L.I., N.Y.—A,C,AC  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—O,Q,X,AC

# ELECTRONIC INDUSTRIES DIRECTORY

Precision Apparatus Co., 92-27 Horace Harding Blvd., Elmhurst, N.Y.—AC  
 Precision Electronics, Inc., 9101 King Ave. Franklin Park, Ill.—AM  
 Precision Products, 719 7 St. N.W., Washington, D.C.—O,X  
 Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.—F,AE  
 Pyrometer Instrument Co., 92 Portland Ave., Bergenfield, N.J.—AL  
 Q-O-S Corp., 29 W. 60 St., New York 23, N.Y.—O  
 Radiatron Inc., P. O. Box Q, Melbourne, Fla.—G  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—AC,AM  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV. ENG'G. PRODUCTS DIV., Camden 2, N.J.—N,AO  
 RADIO CORP. OF AMERICA, RCA TUBE DEPT., 415 S. 5 St., Harrison, N.J.—G,AC  
 Radio Frequency Labs., Inc., Boonton, N.J.—G  
 RAYPAR INC., 7800 W. Addison St., Chicago 34, Ill.—AC  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—A,O  
 Refrigeration Systems Inc., 646 W. Wash. Blvd., Chicago 6, Ill.—F  
 Regulator Eng'g. & Devel. Co., 11545 W. Jefferson Blvd., Culver City, Calif.—AE  
 Research Electronics Labs., Roslyn, Pa.—P  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—B,C,G,K,L,N,P,S,T,U,W,Z,AB  
 R.F.I. Shielded Enclosures Corp., 3634 N. Lawrence St., Philadelphia 40, Pa.—AF  
 Richards Co., Arklay S., 37 Winchester St., Newton Highlands 61, Mass.—AL  
 Riverbank Labs., Batavia Ave., Geneva, Ill.—AN  
 Robinette Co., W. C., 802 Fair Oaks Ave., S. Pasadena, Calif.—AE  
 Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—R  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—AI  
 Rofan Co., Rt. 1 & Camp Meeting Rd., Toppsfield, Mass.—C,AC  
 Rollin Co., 2010 N. Lincoln Ave., Pasadena 3, Calif.—S  
 Ruge-DeForest Inc., 84 Mass. Ave., Cambridge, Mass.—P  
 Rutherford Electronics Co., 3707 S. Robertson Blvd., Culver City, Calif.—G,AB  
 Rutishauser Corp., 490 S. Fair Oaks Ave., Pasadena 1, Calif.—P  
 Ryan Industries Inc., 19159 John R St., Detroit 3, Mich.—S  
 Safe Flight Instrument Corp., 4 Water St., White Plains, N.Y.—S  
 Saratoga Industries, Ballston Ave., Saratoga Springs, N.Y.—T  
 Sexl Instrument Co., Pine Hill, Harvard, Mass.—P  
 Scientific Specialties Corp., Snow & Union St., Brighton 35, Mass.—O  
 Scott Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—J,S,T,U,AC  
 Semon Bache & Co., 636 Greenwich St., New York 14, N.Y.—O  
 Servo Corp. of America, 2020 Jericho Tpke., New Hyde Park, L.I., N.Y.—E,N  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—A,B,L,T,AI  
 SHIELDING, INC., Riverside Park, N.J.—AF  
 Shoup Eng'g. Co., 221 E. Cullerton St., Chicago 16, Ill.—S  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—G,P,T  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—G,AC,AL  
 Sittler Corp., 18 N. Ada St., Chicago 7, Ill.—Y  
 Sola Electric Co., 4633 W. 16 St., Chicago 50, Ill.—AE  
 Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.—K,AE  
 Sound Apparatus Co., Main St., Stirling, N.J.—AD  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Tex.—H,J,S,AH  
 Sparton Radio Television, 2400 E. Ganson St., Jackson, Mich.—N  
 Special Products Co., 9115 Brookville Rd., Silver Spring, Md.—AM  
 Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—A,B,C,AC,AF  
 Specific Products, 5864 Hollywood Blvd., Hollywood 28, Calif.—G,N  
 Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—C,T  
 Sperry Gyroscope Co., Great Neck, L.I., N.Y.—AO  
 SPRAGUE ELECTRIC CO., 233 Marshall St., N. Adams, Mass.—Z,AG  
 Square Root Mfg. Co., 391 Saw Mill River Rd., Yonkers, N.Y.—T,AH  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—AN

Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—L,P,T  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A  
 Star Expansion Products Co., 147 Cedar St., New York 6, N.Y.—V,AH  
 Sticht Co., Herman H., 27 Park Place, New York 7, N.Y.—AI  
 Stoddart Aircraft Radio Co., 6644 Santa Monica Blvd., Hollywood 38, Calif.—C,N,Z  
 Sub Zero Products, 3932 Reading Rd., Cincinnati 29, Ohio—F  
 Supreme Inc., Greenwood, Miss.—AM  
 Taco West Corp., 525 N. Noble St., Chicago 22, Ill.—AL  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—W  
 Tech Labs. Inc., 120 Hillcrest Ave., Leonia, N.J.—A,B,C  
 Technicraft Labs., Inc., Thomaston-Waterbury Rd., Thomaston, Conn.—C,G  
 Techno Instrument Co., 6666 Lexington Ave., Los Angeles 38, Calif.—S  
 TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—L,M,O,T,AB,AE,AK,AO  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—G  
 Telemarine Communication Co., 3040 W. 21 St., Brooklyn 24, N.Y.—N,AB  
 Telerad Mfg. Corp., 1440 Broadway, New York 18, N.Y.—N  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—AE  
 Teltronics Lab., 54 Kinkel St., Westbury, L.I., N.Y.—G  
 Televex Co., 217 Riverdale Ave., Yonkers, N.Y.—O  
 TEL-INSTRUMENT CO., 50 Paterson Ave., E. Rutherford, N.J.—G,L  
 Tenney Eng'g. Inc., 26 Ave. B., Newark 5, N.J.—F  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—N,O,R,V,Y,AJ,AK  
 Trad Television Corp., 1001 1 Ave., Asbury Park, N.J.—C  
 Trans-Sonics Inc., Bedford Airport, Bedford, Mass.—P  
 Ultradyne Eng'g. Labs. Inc., P. O. Box 8007, Albuquerque, N. Mex.—P  
 United Electric Controls Co., 85 School St., Watertown 75, Mass.—AE  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—L,T,AH  
 Universal Mfg. Co., Micro-Wave Div., 410 Hillside Ave., Hillside, N.J.—C  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—AL  
 Valpey Crystal Corp., 1274 Highland St., Holliston, Mass.—L  
 Varo Mfg. Co., 1801 Walnut St., Garland, Tex.—AN  
 VECTRON INC., 400 Main St., Waltham 54, Mass.—C,G,N,T,V,AO  
 Vibroscope Co., 6 E. 39 St., New York 16, N.Y.—S  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—S  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—K,P,S,AB,AE  
 Wang Labs., 296 Columbus Ave., Boston 16, Mass.—K,U  
 Warrick Co., Frederick P., 820 W. 14 Mile Rd., Clawson, Mich.—H  
 Waveline Inc., Caldwell, N.J.—C,N,AC,AO  
 Weichel Eng'g. Co., 1051 Metropolitan Ave., Kensington, Md.—C  
 Weksler Thermometer Corp., 49 W. 32 St., New York 1, N.Y.—P  
 Weltronic Co., 19500 W. 8 Mile Rd., Detroit 19, Mich.—K,AE  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—N  
 Western Instrument Co., 826 N. Victory Blvd., Burbank, Calif.—G  
 WESTINGHOUSE ELECTRIC CORP., 2519 Wilkens Ave., Baltimore 3, Md.—S  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—U,AK,AO  
 Weston Labs., Inc., Oak Hill Rd., Harvard, Mass.—C,G,N,AK  
 Wheeler Labs., Great Neck, L.I., N.Y.—AO  
 White Industries Inc., 421 W. 54 St., New York 19, N.Y.—C,T,AC  
 Wilkor Div., Aerovox Corp., 2882 Detroit Ave., Cleveland 13, Ohio—L,T,AI  
 Wilcox Research Corp., 340 La Brea Ave., Los Angeles 36, Calif.—AJ  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—A,C,L,N,T  
 Worcester Pressed Aluminum Corp., 13 Hope Ave., Worcester, Mass.—V  
 Yonkers Industries Inc., Electronic Designs Inc., (Sub.) 28 School St., Yonkers, N.Y.—AC,AI,AM

## 48—MEASUREMENT & TEST EQUIPMENT—STANDARDS

Standards, capacitance . . . . . A  
 Standards, frequency . . . . . B  
 Standards, inductance . . . . . C  
 Standards, resistance . . . . . D

AIRTRON, INC., 1109 W. Elizabeth Ave., Linden, N.J.—B  
 American Time Products, Inc., 580 5 Ave., New York 36, N.Y.—B

Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—C  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, INC., 2200 Wright Ave., Richmond 3, Calif.—B  
 BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa.—B  
 Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.—B  
 Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—B  
 Daven Co., 191 Central Ave., Newark 4, N.J.—D  
 Decade Instrument Co., Box 153, Caldwell, N.J.—B  
 DeMornay-Bonardi, 3223 Burton Ave., Burbank, Calif.—B  
 Electro-Mec Lab., 19 Murray St., New York 7, N.Y.—D  
 Elk Electronic Labs., Inc., 333 W. 52 St., New York 19, N.Y.—B  
 Ernst Norrman Labs., Williams Bay, Wis.—B  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—B,C  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B,M  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,B,C,D  
 Industrial Transformer Corp., Gouldsboro, Pa.—C  
 Lab. for Electronics, Inc., 75 Pitts St., Boston, Mass.—B  
 L & O Research & Devel. Corp., 134 N. Wayne Ave., Wayne, Pa.  
 MacLeon & Hanopol, Inc., 10 Roland St., Charlestown 29, Mass.—A,D  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—B  
 Riverbank Labs., Batavia Ave., Geneva, Ill.—B  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—D  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—D  
 Technology Instrument Corp., 53 Main St., Acton, Mass.—B  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—A  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—B  
 Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—B  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—C  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—B  
 Yonkers Industries Inc., & Electronics Designs, Inc., 28 School St., Yonkers, N.Y.—D

**49—MEDICAL ELECTRONIC EQUIPMENT**

- Anoxia photometers ..... A
- Corticle stimulators ..... B
- Diathermy equipment ..... C
- Electrocardiographs ..... D
- Electrocauterizers ..... E
- Electroencephalographs ..... F
- Electromyographs ..... G
- Electron microscopes ..... H
- Electrosedative generators ..... I
- Electroshock machines ..... J
- Fluoroscope machines ..... K
- Germicidal lamps ..... L
- Heating elements ..... M
- Hemoglobinometers ..... N
- Photographic x-ray equipment ..... O
- Psychogalvanometers ..... P
- Stethographs & stethophones ..... Q
- X-ray filters ..... R
- X-ray screens ..... S

Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N.Y.—M  
 American Diathermy Products, 11858 Miss. Ave., Los Angeles 25, Calif.—C  
 American Optical Co., Box A, Buffalo 15, N.Y.—N  
 Amperex Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y.—C  
 Arkay Co., 605 1 Ave. S. W., Rochester, Minn.—F  
 Atlas Coil Winders Inc., 39 Manhattan St., Stamford, Conn.—R  
 Audio-Tone Oscillator Co., 6511 Main St., Long Hill, Conn.—I  
 Bar-Ray Products, 209 25 St., Brooklyn 32, N.Y.—O  
 Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—D  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—D,F,G  
 Calbest Eng'g. & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—M  
 Cambridge Instrument Co., Grand Central Terminal, New York 17, N.Y.—D,G,Q  
 Cast Optics Corp., 1010 Post Rd., Riverside, Conn.—R  
 Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.—N,Q  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—D,F,G  
 Columbia Resistors Inc., 216 Lafayette St., New York 12, N.Y.—M

**RESISTOR-CAPACITOR COLOR CODES**

Color	Significant Figure	Decimal Multiplier	Tolerance %	Voltage Rating*
Black	0	1		
Brown	1	10	1*	100
Red	2	10 <sup>2</sup>	2*	200
Orange	3	10 <sup>3</sup>	3*	300
Yellow	4	10 <sup>4</sup>	4*	400
Green	5	10 <sup>5</sup>	5*	500
Blue	6	10 <sup>6</sup>	6*	600
Violet	7	10 <sup>7</sup>	7*	700
Gray	8	10 <sup>8</sup>	8*	800
White	9	10 <sup>9</sup>	9*	900
Gold		10 <sup>-1</sup>	5	1000
Silver		10 <sup>-2</sup>	10	2000
No color			20	500

\* Applies to capacitors only

Cox & Co., 115 E. 23 St., New York, N.Y.—M  
 Dallons Labs., 5066 Santa Monica Blvd., Los Angeles 29, Calif.—C  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—L,O  
 Du Pont De Nemours & Co., E. I., 10 & Market Sts., Wilmington 98, Del.—K,R  
 Eagle Electric Mfg. Co., 23-10 Bridge Plaza S., Long Island City, N.Y.—M  
 Edin Co., 207 Main St., Worcester 8, Mass.—D,F,G,P  
 Eldico of N.Y., 44-31 Douglaston Pkwy, Douglaston, L.I., N.Y.—C  
 Electrodyne Co., Endicott S., Norwood, Mass.—B,G,I  
 Electrofilm Corp., 7116 Laurel Canyon Blvd., N. Hollywood, Calif.—M  
 Electro-Medical Lab., S. Woodstock, Vt.—B,F,G,P,Q  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—A,N  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—M  
 Eng'g. Research & Devel. Co., Addison, Ill.—C  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—F  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—C,D,F,G  
 Fischer & Co., R. A., 517 Commercial St., Glendale 3, Calif.—C,I,L  
 Flett Lab., 3711 Marshall Rd., Drexel Hill, Pa.—Q  
 Gates & Co., G. W., Hempstead Tpke. & Lucille Ave., Franklin Square, L.I., N.Y.—L  
 GENERAL ELECTRIC CO., Nela Park, Cleveland 12, Ohio—L  
 General Electrosonics, Inc., 32 W. 22 St., New York 10, N.Y.—C  
 GULTON MFG. CORP., Metuchen, N.J.—D  
 Hansen Co., Wm., 165 Silverbrook Ave., Niles, Mich.—Q  
 Heiland Research Corp., 130 E. 5 Ave., Denver 9, Colo.—D  
 Huppert Co., K. H., 6830 Cottage Grove Ave., Chicago 37, Ill.—M  
 Lavoie Labs., Morganville, N.J.—G  
 Litton Eng'g. Labs., 1049 Brittan Ave., San Carlos, Calif.—E  
 Lektra Labs., 154 11 Ave., New York 11, N.Y.—B,J  
 Luckenbach & Co., Paul, 312 W 231 St., New York 63, N.Y.—C  
 Lyso Co. Mfg. Co., 1401 Clinton St., Hoboken, N.J.—C  
 Mackay Inc., A. D., 198 Broadway, New York 38, N.Y.—R  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—R  
 Maico Co., 21 N. 3 St., Minneapolis, Minn.—P,Q  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—C,D,F  
 Master Appliances, 1600 Factory Ave., Marion, Ohio—C  
 Medcraft Electronic Corp., 41-41 24 St., Long Island City 1, N.Y.  
 Mendelsohn Speedgun Co., 457 Bloomfield Ave., Bloomfield, N.J.—D  
 Menlo Research Lab., P. O. Box 527, Menlo Park, Calif.—L  
 Merix Chemical Co., 1021 E. 55 St., Chicago 15, Ill.—O  
 Microtran Co. Div. Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach 93, N.Y.—B,J  
 Miskella Infra-Red Co., E. 73 St. & Grand Ave., Cleveland 4, Ohio—M  
 Moradian High Frequency Labs., Bogota, N.J.—C,E  
 Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N.J.—S  
 New Hampshire Ball Bearings, Peterborough, N.H.—R  
 Offner Electronics, Inc., 5320 N. Kedzie Ave., Chicago 25, Ill.—F,J  
 Oregon Corvek Co., 1005 N. W. 16 Ave., Portland, Ore.—D

Orthon Corp., 196 Albion Ave., Paterson, N.J.—S  
 Pacific Transducer Corp., 11921 W. Pico Blvd., Los Angeles 64, Calif.  
 Pereny Equip. Co., 893 Chambers Rd., Columbus 12, Ohio—M  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—R  
 Photocon Research Prod., 421 N. Foothill Blvd., Pasadena 8, Calif.—N  
 Photovolt Corp., 95 Madison Ave., New York 16, N.Y.—N  
 Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N.Y.—B  
 RAYTHEON MFG. CO., Waltham 54, Mass.—M  
 R-C Scientific Instrument, 307 Culver Blvd., Playa Del Rey, Calif.—A  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—C  
 Rich-Roth Labs., 1240 Main St., Hartford 3, Conn.  
 Shannon Luminous Materials Co., 7356 Santa Monica Blvd., Hollywood 46, Calif.—L  
 Sherman Industrial Electronics Co., 5050 Washington Ave., Belleville, N.J.—M

**DO YOU KNOW THAT . . .**

**THE 1953 ELECTRONICS INDUSTRIES DIRECTORY**

contains the new, exclusive

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Standard Electronic Research Corp., 2 East End Ave., New York 21, N.Y.—J  
 Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—O  
 Teca Corp., 139 E. 23 St., New York 10, N.Y.—B,J  
 Technical Operations Inc., 6 Schouler Ct., Arlington 74, Mass.—O  
 Technitrol Eng'g. Co., 2751 N. 4 St., Philadelphia 33, Pa.—D  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—L,M,O,S  
 Tracerlab, 130 High St., Boston 10, Mass.—S  
 U. S. Radium Corp., 535 Pearl St., New York 7, N.Y.—S  
 Vulcan Electric Co., 88 Holten St., Danvers, Mass.—M  
 WALL MFG. CO., P., Erie St., Grove City, Pa.—M  
 Welch Mfg. Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.—N  
 Welsh Electric Co., 1221 Wade St., Cincinnati, 14, Ohio—A  
 Western Gold & Platinum Works, 589 Bryant St., San Francisco 7, Calif.—M  
 Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—S  
 Yellow Springs Instrument Co., P. O. Box 106, Yellow Springs, Ohio—D

# ELECTRONIC INDUSTRIES DIRECTORY

## TUBING, METAL

- Brass tubing .....AAE
- Copper tubing .....AAF
- Flexible metal hose .....AAL
- Monel tubing .....AAG
- Nickel tubing .....AAH
- Silver tubing .....AAI
- Steel tubing .....AAJ
- Tungsten tubing .....AAK

Ace Eng'g. & Machine Co., 3644 Lawrence St., Philadelphia 40, Pa.—D  
 Acheson Colloids Co., 1950 Washington Ave., Port Huron, Mich.—I,K,AJ  
 Acme Oxygen Co., 119 S. Fourth St., Harrison, N.J.—O,T,U,AQ,AU  
 Advance Electronics Co., 8510 North End Ave., Oak Park 37, Mich.—O  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—AS,AAE,AAF  
 Air Associates Inc., 1231 Airway, Glendale 1, Calif.—AAB,AAE  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass.—J  
 Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Penn.—J,M,N,AP,AT,AU  
 Allied Research & Eng'g. Inc., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—F,Z,AL,AO  
 All Star Products, Defiance, Ohio—M  
 ALPHA METALS, 56 Water St., Jersey City, N.J.—P,AC,AX,AAA,ABA,AAE  
 American Cladmetals Co., P. O. Box 544, Carnegie, Pa.—J,AP  
 American Brass Co., Waterbury 20, Conn.—S  
 American Electro Metal Corp., 320 Yonkers Ave., Yonkers 2, N.Y.—K,AJ  
 American Platinum Works, N.J.R.R. & Oliver St., Newark 5, N.J.—AAE  
 American Silver Co., 36-07 Prince St., Flushing, N.Y.—F, G, J, O, S, T, U, V, Y, Z, AA, AD, AE, AH, AJ, AK, AL, AM, AO, AP, AQ, AR, AT, AU, AW, AZ, AAD, AAL, AAW  
 American Solder & Flux Co., 2152 E. Norris St., Philadelphia 24, Pa.—AAA  
 Anchor Metal Co., 244 Boerum St., Brooklyn 6, N.Y.—K, P, W, X, Y, AC, AD, AG, AQ, AS, AX, AY, AAA, AAD  
 Antara Chemicals Div., General Dyestuff Corp., 435 Hudson St., New York 14, N.Y.—K,AA  
 Apollo Metal Works, 66 Place & S. Oak Park Ave., Chicago 38, Ill.—AT  
 Armco Steel Corp., 1683 Curtis St., Middletown, Ohio—AP  
 ARNOLD ENGR. CO., P. O. Box G, Marengo, Ill.—J,K,M,N  
 Art Wire & Stamping Co., 1 Boyden Pl., Newark 2, N.J.—AS  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—AP,AS  
 Baker & Co., 113 Astor St., Newark 5, N.J.—I,AL,AO,AAE  
 Bar-Ray Products, Inc., 209 25 St., Brooklyn 32, N.Y.—AC  
 Bart-Messing Corp., 229 Main St., Belleville 9, N.J.—G  
 Bayside Watch Tool Co., 20-02 Utopia Parkway, Whitestone 57, N.Y.—H  
 Beryllium Corp., Reading 21, Pa.—F,S  
 Bow Solder Products Co., 251 Freeman St., Brooklyn 22, N.Y.—AC,AX,AAE  
 Bram Chemical Co., 820-65 Ave., Philadelphia 26, Pa.—A, B, C, E, F, G, H, I, J, K, N, O, P, Q, S, T, U, V, W, Z, AD, AE, AF, AG, AJ, AK, AL, AM, AO, AQ, AR, AU, AV, AW, AZ, AAD, AAE, AAF, AAI, AAK, AAW  
 Bridgeport Brass Co., Bridgeport, Conn.—T,U  
 Bristol Brass Corp., 580 Broad St., Bristol, Conn.—F,T,U  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—O  
 Bucks County Enterprises, Quakertown Municipal Airport, Quakertown, Pa.—AS  
 BUD RADIO INC., 2118 E. 55 St., Cleveland 3, Ohio—AP  
 Caltron Products Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.—M  
 Carpenter Steel Co., 101 W. Bern St., Reading, Pa.—AU,AWW  
 Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.—D,F,T,U,V,AP,AAE,AAE,AAF  
 Co-Operative Industries, 100 Oakdale Rd., Chester, N.J.—AH,AAL  
 Cross Co., H., 15 Beckman St., New York 38, N.Y.—AJ,AW,AAK  
 CRUCIBLE STEEL CO. OF AMERICA, Oliver Bldg., Pittsburgh 30, Pa.—MAF  
 Cutler-Hammer Inc., 436 N. 12 St., Milwaukee 1, Wisc.—L  
 Division Lead Co., 336 W. Kinzie St., Chicago 22 Ill.—P, R, W, Y, AC, AF, AX, AY, AAA, AAB, AAC, AAD

## 50—METALS & CARBONS

- Carbon .....A
- Silver Compounds .....G
- Diamonds .....H
- Graphite .....I
- Core Materials & Magnets
- Core materials, laminated .....J
- Core materials, powdered .....K
- Magnets, electro .....L
- Magnets, permanent .....M

### METALS

- Alnico .....N
- Aluminum .....O
- Antimony .....P
- Barium .....Q
- Bearings .....R
- Beryllium .....S
- Brass .....T
- Bronze .....U
- Bronze phosphor .....V
- Cadmium .....W
- Cesium .....B
- Chromium .....C
- Cloth, wire screen .....D
- Cobalt .....E
- Copper .....F
- Die Castings .....X
- Foil .....Y
- Gold .....Z
- Iron .....AA
- Iron oxide .....AB
- Lead & alloys .....AC
- Lithium .....AD
- Magnesium & alloys .....AE
- Manganese .....AF
- Mercury .....AG
- Metal bellows .....AH
- Metallic Paint .....AI
- Molybdenum .....AJ
- Monel .....AK
- Nickel .....AL
- Platinum .....AM
- Porous bearing metals .....AN
- Sheet metal .....AP
- Silver brazing alloys .....AQ
- Silver, pure .....AO
- Spring contact metals .....AR
- Stampings .....AS
- Steel, metal coated .....AT
- Steel, stainless .....AU
- Strontium .....AV
- Tantalum .....AW
- Thermostatic metals .....AWW
- Tin & alloys .....AX
- Zinc .....AY
- Zirconium .....AZ

### SOLDER

- Aluminum solder .....AAA
- Lead-tin solder .....AAB
- Printed circuit solder .....AAC
- Silver solder .....AAD

Dixon Crucible Co., Joseph, Wayne & Monmouth Sts., Jersey City 3, N.J.—I  
 Du-Co Ceramics Co., Box 587, Butler, Pa.  
 EBY INC., HUGH H., 4700 Stenton Ave., Philadelphia 44, Pa.—AS  
 Electronic Parts Mfg. Co., 508 25 St., Union City, N.J.—AS  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—L  
 Enthoven Solders Ltd., 107 N. Water St., Rochester 4, N.Y.—P,AC,AX,AAA  
 Fansteel Metallurgical Corp., 2200 Sheridan Rd., N. Chicago, Ill.—AJ,AW,AAK  
 Farrelloy Co., 1245 N. 26 St., Philadelphia 21, Pa.—AAA,AAE  
 Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N.Y.—F, O, P, T, U, W, AC, AE, AX, AY, AAA, AAB  
 Ferricone, Inc., 16 School St., Yonkers, N.Y.—K  
 Ferroxcube Corp of America, 233 E. Bridge St., Saugerties, N.Y.—K  
 Flexonics Corp., 1315 S. 3 Ave., Maywood, Ill.—AH,AAE,AAF,AAJ,AAE  
 Forsberg Mfg., Co., 125 Seaview Ave., Bridgeport 1, Conn.—AS  
 Gale Dorothea Mechanisms, 81-01 Broadway, Elmhurst, Long Island, N.Y.—AS  
 GENERAL CERAMICS & STEATITE CORP., Keasby, N.J.—J,K  
 GENERAL ELECTRIC CO., CARBOLOY DEPT., 11177 E. 8 Mile Rd., Detroit 32, Mich.—M,N  
 GENERAL ELECTRIC CO. Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—R  
 General Magnetic Corp., 10001 Erwin Ave., Detroit 34, Mich.—L,M  
 Goldsmith Bros. Smelting & Refining Co., 111 N. Wabash Ave., Chicago 2, Ill.—G,Z,AC,AG,AM,AO,AQ,AAE  
 GRAPHITE METALLIZING CORP., 1002 Nepperham Ave., Yonkers, N.Y.—A  
 Gries Reproducer Corp., 780 E. 133 St., New York 54, N.Y.—X  
 Hallett Mfg. Co., 160 W. Florence Ave., Inglewood, Calif.—AAL  
 Handy & Harman, 82 Fulton St., New York 38, N.Y.—G,Z,AM,AO,AQ  
 Helwig Co., 2544 N. 30 St., Milwaukee, Wis.—I,R  
 HEPPNER MFG. CO., Round Lake, Ill.—M  
 HUDSON TOOL & DIE, 412 S. 14 St., Newark 7, N.J.—AS  
 Improved Seamless Wire Co., 775 Eddy St., Providence 5, R.I.—I,J,Z,AM,AO,AP,AQ  
 Indiana Steel Products, Valparaiso, Ind.—M,N  
 Instrument Specialties Co., 258 Bergen Blvd., Little Falls, N.J.—AS  
 Int'l. Nickel Co., 67 Wall St., New York 5, N.Y.—AK,AL,AP,AAE,AAH  
 Int'l. Powder & Metallurgy, 439 W. Main St., Ridgway, Pa.—F,T,U  
 Investment Casting Co., 319 Chestnut St., Newark, N.J.  
 Jarrell-Ash Co., 165 Newbury St., Boston 16, Mass.—A, B, C, E, F, I, O, P, Q, S, W, Y, Z, AA, AD, AF, AJ, AL, AM, AO, AV, AW, AY, AZ  
 Javex, Box 646, Redlands, Calif.—AS  
 Johnson Mfg. Co., 600 First Ave., N., Mount Vernon, Iowa—AAA,AAE  
 Jonston Foil Mfg. Co., 6106 S. Broadway, St. Louis 11, Mo.—Y  
 Kanthal Corp., Amelia Pl., Stamford, Conn.—O,C,AA  
 KELLOGG SWITCHBOARD & SUPPLY, 79 W. Monroe St., Chicago 3, Ill.—A  
 KESTER SOLDER CO., 4201 Wrightwood Ave., Chicago 39, Ill.—AAA,AAE  
 Keystone Carbon Co., 1935 State St., St. Marys, Pa.—R,T,U,AA,AN,AU  
 Keystone Watch Case Div., Riverside Metal Co., 1 Pavilion Ave., Riverside, N.J.—V,U,AR,AS  
 King Labs., Inc., 127 Solar St., Syracuse 4, N.Y.—Q,AS,AV  
 Kinney Co., Rosslyn Rd., Carnegie, Pa.—AT  
 Kirk & Blum, 3120 Forer St., Cincinnati 9, Ohio—AP  
 Kocour Co., 3504 W. 48 Pl., Chicago 32, Ill.—G  
 Kulite Tungsten Co., 723 Sip St., Union City, N.J.—E,AJ,AN,AAK  
 Lee Electronic Labs., 233 Dudley St., Boston 19, Mass.—AS  
 Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—K  
 Lerner Instrument & Electronics, GPO Box 620, Brooklyn 1, N.Y.—AAA,AAE  
 Lewis Spring & Mfg. Co., 2656 W. North Ave., Chicago 47, Ill.—AR,AS

## 44,000,000 Tubes, 974,000 Kinescopes, Sold in March

Cathode ray tube shipments totalled 974,154 units valued at \$23,772,801 while 44,691,200 receiving tubes worth \$29,978,827 were sold in the month, reports RTMA.  
 Sales in the first three months of 1953 totalled 122,058,756 receiving tubes valued at \$82,955,367 and 2,798,921 TV-picture tubes valued at \$67,696,464, RTMA said.

Mackay Inc., A. D., 198 Broadway, New York 38, N.Y.—A, B, C, D, E, F, I, K, O, P, Q, S, V, W, Y, Z, AA, AB, AC, AD, AE, AF, AG, AJ, AK, AL, AM, AP, AO, AR, AU, AV, AW, AX, AY, AZ, AAH, AAL, AAK, AWW  
Magnetic Core Corp., Ossining, N.Y.—K  
Magnetic Metals Co., Hayes Ave., at 21 St., Camden 1, N.J.—J  
Magnetic Powders, Inc., Box 247, Johnsonburg, Pa.—K, AA, AB  
Magnetics, Inc., Box 230-T, Butler, Pa.—J  
Makepeace Co., D.E., Attleboro, Mass.—AAD  
Malkin-Illion, 396 Colt St., Irvington 11, N.J.  
MALLORY & CO., P.R., 3029 E. Washington St., Indianapolis 6, Ind.—K, AE, AJ  
MELPAR, 452 Swann Ave., Alexandria, Va.—K  
Metal Products Co., Craighead St., Nashville 4, Tenn.—AS  
Metal Textile Corp., Roselle, N.J.—D  
Metals & Controls Corp., Gen. Plate Div., 34 Forest St., Attleboro, Mass.—F, G, J, S, V, Y, Z, AM, AO, AP, AQ, AR, AS, AAD, AAI, AWW  
Micro-Circuits Co., New Buffalo, Mich.—AI  
Milwaukee Stamping Co., 800 S. 72 St., Milwaukee 14, Wisc.—AS  
Miniature Prec. Bearings, Keene, N.H.—R  
Mitchell Rand Companies, 51 Murray St., New York 7, N.Y.—F  
Moloney Electric Co., 5090 Birtcher Ave., St. Louis, Mo.—J, K  
Multicore Sales Corp., 164 Duane St., New York, N.Y.—AAA, AAB, AAC  
National Lead Co., 111 Broadway, New York 6, N.Y.—AC, AAB, AAD  
NATIONAL MOLDITE CO., 1410 Chestnut Ave., Hillside 5, N.J.—K  
Ney Co., J.M., Hartford 1, Conn.—Z, AAD  
Osborne Products, Glen Ellyn, Ill.—  
Park Armature Co., 883 Boylston St., Boston 16, Mass.—L  
Patton-Mac Guyer Co., 201 Chapman St., Providence 5, R.I.—AS  
Permag Corp., 214 Taaffe Pl., Brooklyn 5, N.Y.—M  
Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—J, K  
Phelps Dodge Copper Products, 40 Wall St., New York 5, N.Y.—F, T, U, AA, E, AAF  
Pix Mfg., 22 Bedford, Newark 3, N.J.—AS  
Powdered Metal Products Corp., 9335 W. Belmont Ave., Franklin Park, Ill.—K, R, T, U, AA, AN  
Precision Tube Co., Church Rd. & Wissahickon Ave., North Wales, Pa.—AAE, AAF, AAG, AAH, AAJ  
Pyroferic Co., 621 E. 216 St., New York 67, N.Y.—J, K  
Quality Components, Inc., St. Marys, Pa.—K  
Rada Products Co., 2911 W. Carroll Ave., Chicago 12, Ill.—AS  
Radio Cores, Inc., 9540 Tulley Ave., Oak Lawn, Ill.—J, K  
Republic Foil & Metal Mills, 55 Triangle St., Danbury, Conn.—O, Y  
Revere Copper & Brass, 230 Park Ave., New York 17, N.Y.—F, O, T, U, V, AP, AS, AA, E, AAF, AAJ  
Reynolds Metals Co., 2000 S. 9 St., Louisville, Ky.—T  
Richardson Labs., Kenneth, 254 Vincent Ave., Lynbrook, N.Y.—L  
Rigidized Metals Corp., 658 Ohio St., Buffalo 3, N.Y.—A, F, J, O, T, U, V, Y, AA, AC, AE, AF, AK, AL, AP, AT, AU, AX, AY, AZ, AAH, AAJ  
Ruby Chemical Co., 68-70 McDowell St., Columbus 8, Ohio—AAB  
Ryerson & Son, Inc., Joseph T., Box 8000-A, Chicago 80, Ill.—AP, AU, AAJ  
St. Marys Carbon Co., State St., St. Marys, Pa.—A, I, R, AH  
Secon Metals, 228 E. 45 St., New York, N.Y.—AAD  
Semrow Products Co., 6120 N.W. Highway, Chicago 31, Ill.—D  
Sightmaster Corp., 111 Cedar St., New Rochelle, N.Y.—AN, AAA  
Sittler Corp., 18 N. Ada, Chicago 7, Ill.—A  
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—L  
SPEER CARBON CO., St. Marys, Pa.—A, I  
SPEER RESISTOR DIV., SPEER CARBON CO., St. Marys, Pa.—K  
Spincraft, Inc., 4122 W. State St., Milwaukee 8, Wisc.—AS  
STACKPOLE CARBON CO., St. Marys, Pa.—A, K  
Standard Metals Corp., 262 Broad St., North Attleboro, Mass.—J, Z, AM, AO, AQ, AR, AAD, AAF, AAI  
STEWART MFG. CO., D. M., 3608 Jerome Ave., Chattanooga, Tenn.—J  
STUPAKOFF CERAMIC & MFG. CO., Latrobe, Pa.  
Super Flow Solder, 90 State St., Albany, N.Y.—AAA, AAB, AAD  
SUPERIOR FLUX & MFG. CO., 1302 Ontario St., Cleveland 13, Ohio—AQ  
SUPERIOR TUBE CO., 2500 Germantown Ave., Norristown, Pa.—AS, AA, E, AAF, AAH, AAI, AAJ  
SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—AS  
Television Labs, Inc., 5045 W. Lake St., Chicago 44, Ill.—L  
Tempel Mfg. Co., 1939 Bryn Mawr Ave., Chicago 26, Ill.—J  
Thomas & Skinner, 1120 E. 23 St., Indianapolis 7, Ind.—C, E, J, M, N  
Thomson Clock Co., H.C., 38 Federal St., Bristol, Conn.—T, AA, E, AAJ

Tricon Mfg. Co., 8008 Wallace St., Chicago 20, Ill.—G, Z, AM, AO, AQ, AAB, AAD  
Uniform Tubes, Colleville 2, Pa.—AAE, AAF  
Vacuum Metals Corp., 70 Memorial Dr., Cambridge 42, Mass.—E, F, AA, AL, AU  
Varian Associates, 990 Varian Ave., San Carlos, Calif.—L, M  
WALL MFG. CO., P., Grove City, Pa.—AAB  
Western Gold & Platinum Works, 589 Bryan St., San Francisco 7, Calif.—G, Z, AG, AM, AO, AQ, AAD  
WESTINGHOUSE ELECTRIC CORP., P. O. Box 868, Pittsburgh 30, Pa.—J  
Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.—L  
Whitehead Stamping, 1661 W. Lafayette Blvd., Detroit 16, Mich.—AS  
Wildberg Bros. Smelting & Refining, 742 Market St., San Francisco 2, Calif.—G, Z, AG, AM, AO, AQ, AAD, AAI  
Williams & Co., C.K., 640 N. 13 St., Easton, Pa.—E, F, J, K, AB  
Wilson, H.A., U.S. Route 22, Union, N.J.—K, AWW  
Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—A, I, K, Y, AC, AX, AAB, AAD

## 51—METERS, AUDIO

Meters, audio ..... A  
Meters, decibel ..... B  
Meters, frequency ..... C  
Meters, modulation ..... D  
Meters, noise ..... E  
Meters, output ..... F  
Meters, phase angle ..... G  
Meters, recording ..... H  
Meters, sound level ..... I  
Meters, wow & flutter ..... J

Advance Electronics Co., P. O. Box 394, Pasaic, N.J.—G  
Aeronautical Electronics, Raleigh-Durham Airport, Raleigh, N.C.—G  
American Electroneering Corp., 2040 Colo. Ave., Santa Monica, Calif.—D  
Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—E  
Ballantine Labs., Boonton, N.J.—A, B, V  
Barber-Colman Co., 1300 Rock St., Rockford, Ill.—H  
Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—A, C, E  
BERKELEY SCIENTIFIC, DIV., BECKMAN INSTRUMENTS, INC., 220 Wright Ave., Richmond 3, Calif.—C  
Biddle Co., Jas. G., 1316 Arch St., Philadelphia 7, Pa.—C  
Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A, C, E, G, H, I  
Browning Labs., Inc., 750 Main St., Winchester, Mass.—C  
BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—E, I  
Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—C, D  
Burlington Instrument Co., 203 N. 3 St., Burlington, Iowa—B  
Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—C  
Clarke Instruments, 919 Jesup-Blair Dr., Silver Spring, Md.—G  
Clough-Brengle Co., 6014 Broadway, Chicago 40, Ill.—B  
Colortone Television Co., 238 William St., New York 38, N.Y.—C  
Conn Ltd., C. G., Elkhart, Ind.—C  
Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—B  
Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A  
Daven Co., 191 Central Ave., Newark 4, N.J.—A, B, C, F, I  
Dayton Aviation Radio & Equip. Corp., P. O. Box 167, Vandalia, Ohio—F  
DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N.Y.—B  
Deltron Inc., P. O. Box 192, Glenside, Pa.—G  
Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—C  
Diatron Co., 3327 Dixie Dr., Houston 21, Tex.—C  
Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—C  
D & R Ltd., 402 E. Gutierrez St., Santa Barbara, Calif.—D  
Dubrow Development Co., 235 Penn St., Burlington, N.J.—A, D, E, I  
Electric Design & Mfg. Co., Jefferson St., Burlington, Iowa—B  
Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasie, Pa.—H  
Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—C  
Electro-Tech Equipment Co., 308 Canal St., New York, N.Y.—A, B, C, H  
Empire Devices, 38-25 Bell Blvd., Bayside, L.I., N.Y.—E  
Eng'g. Associates, 434 Patterson Rd., Dayton 9, Ohio—C  
Eng'g. Research & Development Co., Addison, Ill.—E  
Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A, B, C, E, F, G, J  
Erwood, Inc., 1770 W. Berteau Ave., Chicago 13, Ill.—E, I  
Espy Mfg. Co., 528 E. 72 St., New York 21, N.Y.—C, D, E, I

Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.—C, H  
Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—C  
Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A, B, C, E, F, I  
Ferris Instrument Co., 110 Cornelia St., Boonton, N.J.—E  
Fielden Instrument Div., Robertshaw-Fulton Controls, 2920 N. 4 St., Philadelphia 33, Pa.—H  
Fluke Eng'g. Co., John, 1111 W. Nickerson St., Seattle 99, Wash.—G  
Foxboro Co., 38 Neponset Ave., Foxboro, Mass.—H  
Frequency Standards, P. O. Box 504, Asbury Park, N.J.—C  
Furst Electronics, 3322 W. Lawrence Ave., Chicago 25, Ill.—J  
GENERAL ELECTRIC CO. Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—C, G, I  
GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—D  
GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A, B, C, D, E, F, I  
GERTSCH PRODUCTS, INC., 11846 Miss. Ave., Los Angeles 25, Calif.—C, H  
Giannini & Co., Inc., G.M., Pasadena 1, Calif.—D  
Granco Products Inc., 36-17 20 Ave., Long Island City 5, N.Y.—C  
Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—A, C, D  
HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—F, H  
Impact-O-Graph Corp., 1900 Euclid Bldg., Cleveland 15, Ohio—H  
Industrial Test Equip. Co., 55 E. 11 St., New York 3, N.Y.—G  
Instrument Electronics Corp., 90 Main St., Port Washington, N.Y.—A  
International Instrument, Inc., P. O. Box 2954, New Haven 15, Conn.—B, I  
Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—C  
Lampkin Labs., Inc., Rt. 1, Brandenton, Fla.—C, D  
Lavoie Labs., Inc., Morganville, N.J.—C  
Loral Electronics Corp., 794 E. 140 St., New York 54, N.Y.—C  
Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—A, C, D, E, F, H, I  
Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—C  
Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—B  
Massa Labs., Inc., 5 Fottler Rd., Hingham, Mass.—I  
Maxson Corp., W. L., 460 W. 34 St., New York 1, N.Y.—G  
MEASUREMENTS CORP., Boonton, N.J.—A, E  
Meters, Inc., 5353 N. Keystone Ave., Indianapolis 20, Ind.—B  
Mill Instrument Corp., 92-15 72 St., Jamaica 33, N.Y.—B  
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—C  
MILLIVAC INSTRUMENT CORP., 444 Second St., Schenectady, N.Y.—B, H  
Minneapolis-Honeywell Regulator Co., Wayne & Windrum Aves., Philadelphia 44, Pa.—C, H  
Minnesota Electronics Corp., 47 W. Water St., St. Paul 1, Minn.—C, J  
New London Instrument Co., P. O. Box 139, New London, Conn.—D  
North American Instruments, 3445 Cahuenga Blvd., Los Angeles 28, Calif.—C  
Oak Ridge Products, Mfg. Div. Video Television, Inc., 92-15 172 St., Jamaica 33, N.Y.—B  
PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—D, F  
Phila. Scientific Glass Co., 4 Eckard Ave., Abington, Pa.—H  
Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—H  
POLYTECHNIC RESEARCH & DEVEL. CO., 55 Johnson St., Brooklyn 1, N.Y.—E  
Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—C  
Precise Devel. Corp., 999 Long Beach Rd., Oceanside, L.I., N.Y.—A  
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—H  
Premax Prods. Div., Chisholm-Ryder, Niagara Falls, N.Y.—AS  
Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—C  
Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—B, F  
RADIO CORP. OF AMERICA, RCA VICTOR DIV., ENG'G. PRODUCTS DIV., Camden 2, N.J.—A  
Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—E  
Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—A, B, E, I  
Seismograph Service Corp., P. O. Box 1590, Tulsa, Okla.—G  
Scheffco Mfg., Palisades Park, N.J.—AS  
Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—A, B, F, I  
Sonotone Corp., Elmsford, N.Y.—A  
Spartan Radio Television, 2400 E. Ganson St., Jackson, Mich.—C  
Standard Electric Time Co., 119 Logan St., Springfield, Mass.—C  
Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A, B, C, D, F  
Supreme, Inc., Greenwood, Miss.—F  
Technology Instrument Corp., 53 Main St., Acton, Mass.—E, G

Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—C,G  
 Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio—B,F,I  
 Vacolite Co., 3003 N. Henderson St., Dallas 6, Texas—A  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—C  
 Walkirt Co., 145 W. Hazel St., Ingwood 3, Calif.—C  
 Wang Labs., 296 Columbus Ave., Boston 16, Mass.—C  
 Weksler Thermometer Corp., 49 W. 32 St., New York 1, N.Y.—H  
 Welch Mfg. Co., W.M., 1515 Sedgwick St., Chicago 10, Ill.—B,I  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—C,D  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—B,C,F,G,I

# ELECTRONIC INDUSTRIES DIRECTORY

Cambridge Instrument Co., Grand Central Terminal New York 17, N.Y.—G  
 Central Scientific Co., 1700 W. Irving Park Rd., Chicago, Ill.—D,E  
 Century Geophysical Corp., 3406 W. Wash. Blvd., Los Angeles 18, Calif.—C,G  
 Chicago Industrial Instrument Co., 536 W. Elm St., Chicago 10, Ill.—M,O,P,R,V,X,W  
 Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—F  
 Clarke Instruments, Div. Nat'l. Electrical Machine Shops Inc., 919 Jesup-Blair Dr., Silver Spring, Md.—T  
 Clippard Instrument Lab., 7390 Colerain Rd., Cincinnati 24, Ohio—W  
 Clough-Brengle Co., 6014 Broadway, Chicago 40, Ill.—B,V  
 Colortone Television Co., 238 William St., New York 38, N.Y.—F  
 Columbia Electric Mfg. Co., 4519 Hamilton Ave., Cleveland 14, Ohio—A  
 Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J.—K  
 Computer Corp. of America, 149 Church St., New York 7, N.Y.—X  
 Conn Ltd., C.G., Electronic Small Goods Div., Elkhart, Ind.—F  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—P,R  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A  
 Cubic Corp., Scott & Cannon Sts., San Diego 6, Calif.—Y  
 Daven Co., 191 Central Ave., Newark 4, N.Y.—F,S,W  
 Dayton Aviation Radio & Equip. Corp., Dayton Municipal Airport, Vandalis, Ohio—S  
 DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N.Y.—A,I,L,O,W  
 Delta Electronics Inc., Div. of Electronic Indicator Corp., 259 Green St., Brooklyn 22, N.Y.—K,P,R,W  
 Deltron Inc., P. O. Box 192, Glenside, Pa.—T  
 Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—F  
 Diatron Co., 3327 Dixie Dr., Houston 21, Texas—F  
 Dice Co., J.W., 1 Engle St., Englewood, N.J.—K  
 Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—F  
 Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—G,L  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—H,R,Q,S,V,W  
 Edison Inc., Thomas A., Instrument Div., W. Orange, N.J.—N  
 Electric Design & Mfg. Co., Jefferson St., Burlington, Iowa—A,C,L,O  
 Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasio, Pa.—A,G,O,X  
 Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—O,P,W  
 Electronic Measurements Corp., 280 Lafayette St., New York 12, N.Y.—W  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—F  
 Electro-Tech Equipment Co., 308 Canal St., New York, N.Y.—A,B,C,E,F,G,I,J,K,L,M,O,P,R,S,U,W,Y  
 Electro-Technics Inc., 198 Albion Ave., Paterson, N.J.—V  
 Elk Electronic Labs., Inc., 333 W. 52 St., New York 19, N.Y.—V  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—K  
 Empire Devices, 38-25 Bell Blvd., Bayside, L.I., N.Y.—Q  
 Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio—F  
 Engineering Research & Devel. Co., Addison, Ill.—Q  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,C,D,F,L,N,O,Q,S,T,X,Y  
 Erwood, Inc. 1770 W. Berteau Ave., Chicago 13, Ill.—Q  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—D,E,F,P,Q,W  
 Esterline-Angus Co. Inc., P. O. Box 596, Indianapolis, Ind.—A,F,I,J,O,R,U,X,V  
 Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—F  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—B,F,H,I,K,M,O,P,Q,R,S,V,W,X  
 Ferranti Electric Inc., 30 Rockefeller Plaza, New York 20, N.Y.—I,X  
 Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4 St., Philadelphia 33, Pa.—A,L,O,X  
 Ferris Instrument Co., 110 Cornelia St., Boonton, N.J.—Q  
 Fluke Engineering Co., John, 1111 W. Nickerson St., Seattle 99, Wash.—A,T,U,W,Y  
 Fraser Development Lab., P. O. Box 73, Huntington Station, N.Y.—E  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—K,V,W,X  
 Frequency Standards, P. O. Box 504, Asbury Park, N.J.—F  
 Gaskins Co., 1005 S. Aurora Way, Wheaton, Ill.—H,P,W

GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—A,D,E,F,G,I,K,L,O,P,R,T,U,W,X,Y  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—B,F,K,Q,S,U,X,W  
 GERTSCH PRODUCTS, INC., 11846 Mississippi Ave., Los Angeles 25, Calif.—F  
 G-M Labs., Inc., 4300 N. Knox Ave., Chicago 41, Ill.—G  
 Granco Products, Inc., 36-17 20 Ave., Long Island City 5, N.Y.—F  
 Greibach Research & Devel. Labs., 80 Pryer Terrace, New Rochelle, N.Y.—A,C,D,X,W  
 GULTON MFG. CORP., Metuchen, N.J.—B,M  
 G. W. Associates, P. O. Box 2263, E. Segundo, Calif.—X,Y  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—F,H,W  
 HICKOCK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—A,B,C,G,I,N,O,P,R,S,U,W,X,Y  
 Hoyt Electrical Instrument Works 292 Main St., Cambridge 42, Mass.—A,G,L,O,X  
 Industrial Television, 369 Lexington Ave., Clifton, N.J.—P  
 Industrial Test Equipment Co., 55 E. 11 St., New York 3, N.Y.—T  
 Instrument Electronics Corp., 90 Main St., Port Washington, N.Y.—X,W  
 Instrument Labs., 315 W. Walton Pl., Chicago, Ill.—A,I,J,O,X,Y  
 International Instruments, Inc., P. O. Box 2954, New Haven 15, Conn.—A,C,L,O,P,R  
 Jackson Electrical Instrument Co., 18 S. Patterson Blvd., Dayton 1, Ohio.—R,W  
 Janco Corp., 311 Winona Ave., Burbank, Calif.—A  
 Javex, Box 646, Redlands, Calif.—X  
 J-B-T Instruments, 441 Chapel St., New Haven, Conn.—G  
 Jobbins Electronic Enterprises, Menlo Park, Calif.—L  
 Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, Ohio—D,K,L,N,Y  
 Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—F  
 Klein-Electronics Mfg. Co., 2404 S. La Brea Ave., Los Angeles 16, Calif.—E  
 Laboratory for Electronics, Inc., 75 Pitts St., Boston, Mass.—E  
 Lampkin Labs., Inc., Rt. 1, Brandenton, Florida—F  
 Land-Air, Inc., 440 W. Superior St., Chicago 10, Ill.—D  
 Lavoie Labs., Inc., Morganville, N.J.—F,H  
 Loral Electronics Corp., 794 E. 140 St., New York 54, N.Y.—F  
 Lyman Electronic Corp., 12 Cass St., Springfield, Mass.—R  
 MacLeon & Hanopol, Inc., 10 Roland St., Charlestown 29, Mass.—K  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—B,F,H,M,Q,R,S,V,W,X  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—F  
 Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—A,C,E,G,I,L,O,S,X  
 Maxson Corp., W.L., 460 W. 34 St., New York 1, N.Y.—T  
 MEASUREMENTS CORP., Boonton, N.J.—Q  
 Meters, Inc., 5353 N. Keystone Ave., Indianapolis 20, Ind.—A,C,G,I,L,O,P,W  
 Metropolitan Electronics & Instruments Co., 106 5 Ave., New York 11, N.Y.—A,B,W,X  
 Midwestern Geophysical Lab., 3401 S. Harvard, Tulsa, Okla.—G  
 Mil Instrument Corp., 92-15 172 St., Jamaica 33, N.Y.—A,C,G,I,J,L,O,P,R,S,X  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—F  
 MILLIVAC INSTRUMENT CORP., 444 2 St., Schenectady, N.Y.—A,K,L,N,O,R,W  
 Minneapolis-Honeywell Regulator Co., 4428 Wayne Ave., Philadelphia 44, Pa.—B,F  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—B  
 New London Instrument Co., P. O. Box 189, New London, Conn.—O,V  
 Nilsson Electrical Lab., 103 Lafayette St., New York 13, N.Y.—A,L,O,X  
 Non-Linear Systems, Box "S", Del Mar, Calif.—X  
 North American Instruments, 3445 Cahuenga Blvd., Los Angeles 28, Calif.—F  
 Oak Ridge Products, Mfg. Div. Video TV, Inc., 92-15 172 St., Jamaica 33, N.Y.—A,C,G,I,O,P,R,X  
 Ohmart Corp., 2347 Ferguson Rd., Cincinnati 38, Ohio—D,N  
 Peerless TV Radio Co., 6508 Euclid Ave., Cleveland, Ohio—W  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—A, C, G, I, J, K, L, N, O, P, R, S, X  
 Phoenix Precision Instrument Co., 3803 5 St., Philadelphia 40, Pa.—E  
 POLYTECHNIC RESEARCH & DEVEL. CO., 55 Johnson St., Brooklyn 1, N.Y.—H,Q  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—F  
 Precise Development Corp., 999 Long Beach Rd., Oceanside, L.I., N.Y.—W  
 Precision Apparatus Co., 92-27 Horace Harding Blvd., Elmhurst, N.Y.—A,B,C,L,O,P,W,X  
 Precision Electronics, Inc., 9101 King Ave., Franklin Park, Ill.—W  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—F  
 Pyramid Instrument Corp., 630 Merrick Rd., Lynbrook, N.Y.—A,P,X  
 Pyrometer Instrument Co., 92 Portland Ave., Bergenfield, N.J.—G

## 52—METERS, ELECTRICAL MEASUREMENT

Meters, ammeter	A
Meters, capacitance	B
Meters, d'arsonval	C
Meters, electrometer	D
Meters, flux	E
Meters, frequency	F
Meters, galvanometer	G
Meters, impedance	H
Meters, kilovolt	I
Meters, kilowatt	J
Meters, megohm	K
Meters, microampere	L
Meters, microfarad	M
Meters, micromicroampere	N
Meters, milliamperere	O
Meters, multimeter	P
Meters, noise	Q
Meters, ohm	R
Meters, output	S
Meters, phase angle	T
Meters, power factor	U
Meters, Q	V
Meters, vacuum tube volt	W
Meters, volt	X
Meters, watt	Y
Meters, watt-hour	Z

Aeme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—V  
 Advance Electronics Co., P. O. Box 394, Passaic, N.J.—H,T  
 Aerolux Light Corp., 653 11 Ave., New York 36, N.Y.—I  
 Aeronautical Electronics, Inc., Raleigh-Durham Airport, Raleigh, N.C.—T  
 American Chronoscope Corp., 316 W. 1 St., Mount Vernon, N.Y.—O,P,R,W  
 American Encaustic Tiling Co., 909 Kenilworth Ave., Lansdale, Pa.—Z  
 Applied Physics Corp., 362 W. Colo. St., Pasadena 1, Calif.—D  
 Assembly Products, Main and Bell Sts., Chagrin Falls, O.—L,O  
 Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—K,R  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—D  
 Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—Q  
 Ballantine Labs., Inc., Boonton, N.J.—P,W  
 Barber-Colman Co., 1300 Rock St., Rockford, Ill.—O  
 Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—F,H,Q  
 Beede Electrical Instrument Co., Penacook, N.H.—A,O,L,X  
 BENDIX AVIATION CORP., CINCINNATI DIV., 203 W. 3 St., Cincinnati 2, Ohio—D  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, INC., 2200 Wright Ave., Richmond 3, Calif.—F  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—G  
 Beta Electric Corp., 333 E. 103 St., New York 29, N.Y.—I  
 Biddle Co., Jas. G., 1316 Arch St., Philadelphia 7, Pa.—F,G,K,R  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—V  
 BOONTON RADIO CORP., Intervale Rd., Boonton, N.J.—B,H,V  
 Borden Eng'g. Co., 63 Clinton Ave., New Providence, N.J.—G,R  
 Bristol Co., Waterbury 20, Conn.—J  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—F,Q,T  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—P,W  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A,W  
 Browning Labs., Inc., 750 Main St., Winchester, Mass.—F  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—K,L,N,Q  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—F  
 Burlington Instrument Co., 203 N. 3 St., Burlington, Iowa.—A,C,L,N,O,X

Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—A,K,L,O,P,R,S,W,X  
**RADIO CORP. OF AMERICA, RCA VICTOR DIV., ENGG PRODUCTS DIV.**, Camden 2, N.J.—A  
**RADIO CORP. OF AMERICA, RCA TUBE DEPT.**, 415 S. 5 St., Harrison, N.J.—L,W  
Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—R,W,X  
Rawson Electrical Instrument Co., 117 Potter St., Cambridge 42, Mass.—C,B,D,E,I,L,O,P,X  
Reiner Electronics Co., 152 W. 25 St., New York 1, N.Y.—W  
Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—B,V  
Research Electronics Labs., Roslyn, Pa.—W  
Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—Q,W,X  
Seay Instrument Co., 6521 N. Lamar Blvd., Austin 5, Texas—W  
Seismograph Service Corp., P. O. Box 1590, Tulsa, Okla.—T  
Sensitive Research Instrument Corp., 9 Elm Ave., Mount Vernon, N.Y.—A,C,E,G,I,L,O,P,X,Y  
**SHALLCROSS MFG. CO.**, 520 Pusey Ave., Collingdale, Pa.—B,G,H,I,K,R,X  
Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—W,X,Y  
Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—A,B,C,G,I,J,K,L,O,P,R,S,W,X,Y  
Smith Mfg. Co. Nathan R., 105 Pasadena Ave. S. Pasadena, Calif.—I  
Smuckler & Co., A.F., 202 Tillary St., Brooklyn 1, N.Y.—W  
Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—B,K,P,R,W  
Sparton Radio Television, 2400 E. Ganson St., Jackson Mich.—F  
Special Instruments Lab., Inc., 1003 Highland Ave., Knoxville, Tenn.—D,K  
Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—P  
Spellman Television Co., 3029 Webster Ave., Bronx 67, N.Y.—I  
Standard Electric Time Co., 119 Logan St., Springfield, Mass.—F  
Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—F,S  
Sterling Mfg. Co., 7201 Wentworth Ave., Cleveland 2, Ohio—A,O,X  
Sticht Co., Herman H., 27 Park Place New York 7, N.Y.—K,R  
Supreme, Inc., Greenwood, Miss.—A,C,G,L,N,O,P,R,S,W,X  
**SYLVANIA ELECTRIC PRODUCTS** 1740 Broadway, New York 19, N.Y.—W  
Taco West Corp., 525 N. Noble St., Chicago 22, Ill.—C,G  
Technology Instrument Corp., 53 Main St., Acton, Mass.—H,Q,R,T  
Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—W  
Telescreen Corp., 36 Grove St., New Canaan, Conn.—B  
Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—A,B,D,F,G,R,T,U  
Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio—A,C,I,J,K,L,O,P,R,S,W,X,Y  
United States Gauge Div. American Machine & Metals, Inc., Clymer Ave., Sellersville, Pa.—A  
**VICTOREEN INSTRUMENT CO.**, 3800 Perkins Ave., Cleveland 14, Ohio—D  
Videon Electronic Corp., 222 E. Ohio St., Indianapolis 4, Ind.—R  
Wadsworth Mfg., Associates, 509 Balsam St., Liverpool, N.Y.—F  
Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—F  
Wang Labs., 296 Columbus Ave., Boston 16, Mass.—F  
Waveforms, Inc., 333 6 Ave., New York, N.Y.—X  
Welch Mfg. Co., W.M., 1515 Sedgwick St., Chicago 10, Ill.—A,C,I,L,O,P,R,U,X,Y  
West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—F  
Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—D

Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—A,C,F,G,K,L,N,O,P,R,S,T,U,Y  
Weston Labs., Inc., Oak Hill Rd., Harvard, Mass.—K,N  
Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—W  
Yonkers Industries Inc & Electronics Designs, Inc., 28 School St., Yonkers, N.Y.—I,R,W

### 53—METERS—RF

**Meters, ammeters, RF** ..... A  
**Meters, attenuation** ..... B  
**Meters, decibel** ..... C  
**Meters, distortion** ..... D  
**Meters, field strength** ..... E  
**Meters, FM deviation** ..... F  
**Meters, frequency** ..... G  
**Meters, grid dip** ..... H  
**Meters, microwave** ..... I  
**Meters, noise** ..... J  
**Meters, output** ..... K  
**Meters, phase angle** ..... L  
**Meters, R-F power** ..... M  
**Meters, standing wave ratio** ..... N  
**Meters, wave** ..... O

Advance Electronics Co., P. O. Box 394, Passaic, N.J.—L  
Aeronautical Electronics, Inc., Raleigh-Durham Airport, Raleigh, N.C.—L  
**ANDREW CORP.**, 363 E 75 St., Chicago 19, Ill.—N  
Ansley Electronics, Inc., 85 Tremont St., Meriden, Conn.—N  
Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—D,J  
Ballantine Labs, Inc., Boonton, N.J.—C  
Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—D,G,H,J,M  
**BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, INC.**, 2200 Wright Ave., Richmond 3, Calif.—G  
Biddle Co., Jas. G., 1316 Arch St., Philadelphia 7, Pa.—G  
**BOGART MFG. CORP.**, 315 Seigel St., Brooklyn 6, N.Y.—H,I,M,N  
Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—B,D,E,F,G,J,L,M,N  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A  
Browning Labs., Inc., 750 Main St., Winchester, Mass.—F,G  
**BRUSH ELECTRONICS CO.**, 3405 Perkins Ave., Cleveland 14, Ohio—D,J  
Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—G  
Burlington Instrument Co., 203 N. 3 St., Burlington, N.J.—B,E,F,G  
Century Electronics, Div. Century Metalcraft Corp., 14806 Oxnard St., Van Nuys, Calif.—I,O  
Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—G  
Clarke Instruments, Div. of National Electrical Machine Shops, Inc., 919 Jesup-Blair Dr., Silver Spring, Md.—E,L  
Clough-Brengle Co., 6014 Broadway, Chicago 40, Ill.—C  
Colortone Television Co., 238 William St., New York 38, N.Y.—G  
Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—C  
Conn Ltd., C. G., Elkhardt Ind.—G  
Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,B  
Cubic Corp., Scott & Canon Sts., San Diego 6, Calif.—M,O  
Daven Co., 191 Central Ave., Newark 4, N.J.—B,C,D,G,K  
Dayton Aviation Radio & Equip. Corp., Dayton Municipal Airport, Vandalia, Ohio—K  
DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City 1, N.Y.—C  
Deltron Inc., P. O. Box 192, Glenside, Pa.—L  
De Morney-Bonardi, 3223 Burton Ave., Burbank, Calif.—I,N  
Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—G,O  
Diatron Co., 3327 Dixie Dr., Houston 21, Texas—G  
Dubrow Development Co., 235 Penn St., Burlington, N.J.—B,E,F,G  
Dyna-Labs., Inc., 1075 Stewart Ave., Garden City, L.I., N.Y.—E  
Eldico of N.Y., Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—H,N  
Electric Design & Mfg. Co., Jefferson St., Burlington, Iowa—A,C  
Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—B,G,I,M  
Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—C,G,M  
Elk Electronic Labs., Inc., 333 W. 52 St., New York 19, N.Y.—B,E  
Empire Devices, Inc., 38-25 Bell Blvd., Bay-side 61, N.Y.—E,J  
Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio—G  
**ENGINEERING RESEARCH & DEVEL. CO.**, Addison, Ill.—J  
Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—B,C,D,F,G,I,J,K,L,O  
Erwood Inc., 1770 W. Berteau Ave., Chicago 13, Ill.—E,J

Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—E,F,G,H,J,M,N  
Esterline-Angus Co., P. O. Box 596, Indianapolis, Ind.—G  
Federal Mfg. & Eng'g. Corp., 199 Steuben St., Brooklyn 5, N.Y.—G  
**FEDERAL TELEPHONE & RADIO CORP.**, 100 Kingsland Rd., Clifton, N.J.—E  
Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—C,G,H,J,K,M  
Ferris Instrument Co., 110 Cornelia St., Boonton, N.J.—J  
Fluke Eng'g. Co., John, 1111 W. Nickerson St., Seattle 99, Wash.—L  
Frequency Standards, P. O. Box 504, Asbury Park, N.J.—G  
Gaskins Co., 1005 Saurora Way, Wheaton, Ill.—A,H  
**GENERAL ELECTRIC CO Apparatus Div.**, 1 River Rd., Schenectady 5, N.Y.—G-L  
**GENERAL PRECISION LAB. INC.**, 63 Bedford Rd., Pleasantville, N.Y.—I,N  
**GENERAL RADIO CO.**, 275 Mass. Ave., Cambridge 39, Mass.—D,F,G,J,K,O  
**GERTSCH PRODUCTS, INC.**, 11846 Miss. Ave., Los Angeles 25, Calif.—G  
Granco Products Inc., 36-17 20 Ave., Long Island City 5, N.Y.—G,H  
G.W. Associates, P. O. Box 2263, El Segundo, Calif.—I,M  
Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—B,D,F,G,N  
**HICKOK ELECTRICAL INSTRUMENT CO.**, 10514 Dupont Ave., Cleveland 8, Ohio—A,H,K  
Hycon Mfg. Co., 2961 E. Colo. Blvd., Pasadena 8, Calif.—I,M  
Industrial Television, 369 Lexington Ave., Clifton, N.J.—E  
Industrial Test Equip. Co., 55 E. 11 St., New York 3, N.Y.—L  
Int'l. Instruments, Inc., P. O. Box 2954, New Haven 15, Conn.—C  
Jerrold Electronics Corp., 26 & Dickinson Sts., Philadelphia 46, Pa.—E  
Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, Ohio—E  
Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—G,I  
Lampkin Labs. Inc. Rt. #1, Bradentown, Fla.—G  
Lavoie Labs. Inc., Morganville, N.J.—G,N,O  
Lerner Instrument & Electronic Mfg. Corp., G P O Box 620, Brooklyn 1, N.Y.—N  
Linear Equipment Labs. Inc., Brightwater Place, Massapequa, N.Y.—H  
Loral Electronics Corp., 794 E. 140 St., New York 54, N.Y.—G  
Lysco Mfg. Co., 1401 Clinton St., Hoboken, N.J.—H  
Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—M  
Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—F,G,I,J,K,M,O  
Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—E,G,H,M  
Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—C  
Maxson Corp., W. L., 460 W. 34 St., New York 1, N.Y.—L  
**MEASUREMENTS CORP.**, Boonton, N.J.—H,J,O  
Meters, Inc., 5353 N. Keystone Ave., Indianapolis 20, Ind.—C  
**MICO INSTRUMENT CO.**, 80 Trowbridge St., Cambridge 38, Mass.—I  
**MICROWAVE ASSOCIATES, INC.**, 22 Cum- mington St., Boston 15, Mass.—I  
Mil Instrument Corp., 92-15 72 St., Jamaica 33, N.Y.—C  
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—G,H,N  
Millivac Instrument Corp., 444 2 St., Schenec- tady, N.Y.—A,C,M  
Minne-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.—G  
New London Instrument Co., New London, Conn.—M  
North American Instruments, 3445 Cahuenga Blvd., Los Angeles 28, Calif.—G  
Oak Ridge Products, Mfg. Div. Video TV, Inc., 92-15 172 St., Jamaica 33, N.Y.—C  
Oregon Electronic Mfg. Co., 2232 E. Burnside St., Portland 15, Ore.—H  
**PHAOSTRON CO.**, 151 Pasadena Ave., S. Pas- adena, Calif.—A,K  
**POLYTECHNIC RESEARCH & DEVEL. CO.**, 55 Johnson St., Brooklyn 1, N.Y.—I,J,M,N,O  
Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—G,N  
Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—C,H,K  
**RADIO CORP. OF AMERICA, RCA VICTOR DIV., ENGG. PRODUCTS DIV.**, Camden 2, N.J.—A  
Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—I,J  
Rollin Co., 2010 N. Lincoln Ave., Pasadena 3, Calif.—M,N  
Scott, Inc., H. H., 385 Putnam Ave., Cambridge 39, Mass.—C,J  
Seismograph Service Corp., P. O. Box 1590, Tulsa, Okla.—L,N  
**SHALLCROSS MFG. CO.**, 520 Pusey Ave., Collingdale, Pa.—B  
Sierra Electronic Corp. 1050 Brittan Ave., San Carlos, Calif.—D,M,N  
Simpson Electric Co., 5208 W. Kinzie St., Chi- cago 44, Ill.—A,C,E,K,M  
Sparton Radio Television, 2400 E. Ganson St., Jackson, Mich.—G  
Sperry Gyroscope Co., Great Neck, N.Y.—N

### EXCLUSIVE LIST of ELECTRONIC REPRESENTATIVES

This is the only list in any directory devoted exclusively to electronic representatives. Arranged alphabetically according to states and cities, it gives the names and addresses of all independent "reps" throughout the country. It is the most complete and authoritative representatives list ever published.

**TELE-TECH**  
& ELECTRONIC INDUSTRIES

Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—C,F,G,K,M,N  
 Stoddart Aircraft Radio Co., 6644 Santa Monica Blvd., Hollywood 38, Calif.—E  
 Supreme, Inc., Greenwood, Miss.—K  
 Technology Instrument Corp., 53 Main St., Acton, Mass.—J,L  
 Teletronics Lab., 54 Kinkel St., Westbury, L.I., N.Y.—N  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—G,L,M  
 Thompson Products Inc., 2196 Clarkwood Rd., Cleveland 3, Ohio—E  
 Trad Television Corp., 1001 1 Ave., Asbury Park, N.J.—N  
 Transvision, Inc., 460 North Ave., New Rochelle, N.Y.—E  
 Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio—A,K  
 U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, Calif.—D  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—I,N  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—G  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—G  
 Wang Labs., 296 Columbus Ave., Boston 16, Mass.—G  
 Waveline, Inc., Passaic Ave., Caldwell, N.J.—I,N  
 Welch Mfg. Co., W. M. 1515 Sedgewick St., Chicago 10, Ill.—C,M  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—F,G  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—C,G,I,K,L,M  
 Weston Labs. Inc., Oak Hill Rd., Harvard, Mass.—E,I  
 Weymouth Instrument Co., 1440 Commercial St., E. Weymouth 89, Mass.—I

### 54—METERS, SPECIAL PURPOSE

Meters, acceleration ..... A  
 Meters, cable testing ..... B  
 Meters, counting rate ..... C  
 Meters, deflection ..... D  
 Meters, density ..... E  
 Meters, dynamometer ..... F  
 Meters, elapsed time ..... G  
 Meters, events-per-unit time ..... H  
 Meters, exposure for film ..... I  
 Meters, flow ..... J  
 Meters, flutter ..... K  
 Meters, foot candle ..... L  
 Meters, light ..... M  
 Meters, electronic micrometer ..... N  
 Meters, moisture ..... O  
 Meters, null ..... P  
 Meters, PH ..... Q  
 Meters, photoelectric ..... R  
 Meters, pyrometer ..... S  
 Meters, ratio ..... T  
 Meters, spectral ..... U  
 Meters, tachometer ..... V  
 Meters, thermocouple ..... W  
 Meters, thermometer ..... X  
 Meters, vibration ..... Y  
 Meters, viscosity ..... Z  
 Meters, x-ray intensity ..... AA  
 Meter shunts ..... AB

Alpar Mfg. Co., Box 152, Redwood City, Calif.—B  
 American Chronoscope Corp., 316 W. 1 St., Mount Vernon, N.Y.—G  
 American Instrument Co., Silver Spring, Md.—O,Q  
 American Optical Co., Instrument Div., Box A, Buffalo 15, N.Y.—U  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—K  
 Amthor Testing Instrument Co., 45 Van Sinderen Ave., Brooklyn 7, N.Y.—V  
 Anton Electronic Labs., 1226 T. Flushing Ave., Brooklyn 37, N.Y.—AA  
 Assembly Products, Main & Bell Sts., Chagrin Falls, Ohio—S  
 Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—B,V,AB  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—C,H  
 Automatic Temperature Control Co., 5212 Pulaski Ave., Philadelphia 44, Pa.—C  
 Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—V  
 Back Video Corp., F. G., 500 5 Ave., Rm. 2223, New York 36, N.Y.—M  
 Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio—Q,S,X  
 Baird Associates, Inc., 33 University Rd., Cambridge, Mass.—U  
 Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.—F  
 Barber-Colman Co., 1300 Rock St., Rockford, Ill.—O,P,S,W  
 Barton Electronics, Inc., 955 Asylum Ave., Hartford 5, Conn.—R



Batson Electronics Corp., J. A., 1031 S. 27 St., Omaha, Nebr.—V,AB  
 Beckman Instruments, Inc., 820 Mission St., S. Pasadena 1, Calif.—Q  
 Bendix Aviation Corp., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif.—A,D,F,Y  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, INC., 2200 Wright Ave., Richmond 3, Calif.—C,G,H,R  
 Biddle Co., Jas. G., 1316 Arch St., Philadelphia 7, Pa.—V  
 Bourns Labs., 613 Magnolia Ave., Riverside, Calif.—A  
 Branson Instruments, Inc., 430 Fairfield Ave., Stamford, Conn.—J  
 Bristol Co., Waterbury 20, Conn.—G,H,Q,S,V,W,X  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—P  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—B,C,Y  
 Burlington Instrument Co., 203 N. 3 St., Burlington, Iowa—G,N,W,AB  
 Calidyne Co., 751 Main St., Winchester, Mass.—A,Y  
 Cambridge Instrument Co., Grand Central Terminal, New York 17, N.Y.—J,O,Q,S  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—L  
 Central Scientific Co., 1700 W. Irving Park Rd., Chicago, Ill.—O,Q  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—A,U  
 Century Metalcraft Corp., 14806 Oxnard St., Van Nuys, Calif.—Y  
 Citation Products Co., 233 E. 146 St., New York 51, N.Y.—AB  
 Coleman Instruments, Inc., 318 Madison St., Maywood, Ill.—Q  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—Y  
 DeJur-Amsco Corp., 45-01 Northern Blvd., Long Island City, N.Y.—M  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—L,M,R,U  
 Delmhurst Instrument, 607 Cedar St., Boonton, N.J.—O  
 Dice Co., J. W., 1 Engle St., Englewood, N.J.—J,N  
 Diehl Mfg. Co., 1186 FINDERNE AVE., Somerville, N.J.—V  
 Digital Instrument Co., 212 Almeria Ave., Coral Gables, Fla.—C,G,H,V  
 Dillon & Co., W. C., 14620 Keswick St., Van Nuys, Calif.—F,X  
 Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio—G  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—B,H  
 Duncan & Bayley, Inc., 785 Hertel Ave., Buffalo 7, N.Y.—F  
 Edison, Inc., Thos. A., Instrument Div., 93 Lakeside Ave., W. Orange, N.J.—T  
 Electro-Physics Co., 287 Broadway, New York 7, N.Y.—M,R,Z  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—G,L,M,O,R,S,V,W,X,AB  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—B  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—G,H  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A  
 Endevo Corp., 180 E. Calif. St., Pasadena 1, Calif.—A  
 Eng'g. Research Associates, Inc., Div. Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—A  
 Engineering Research & Devel. Co., Addison, Ill.—V,Y  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—G,H,N,O,Q,V,Y  
 Erwood, Inc., 1770 W. Berteau Ave., Chicago 13, Ill.—Y  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,P  
 Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis, Ind.—H,AB  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—S,W  
 Field Electrical Instrument Co., 8 N. Mannheim Blvd., New Platz, N.Y.—W  
 Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4 St., Philadelphia 33, Pa.—O,S  
 Fluke Engineering Co., John, 1111 W. Nickerson St., Seattle 99, Wash.—R  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—P  
 Gardner Lab. Inc., Henry A., 4723 Elm St., Bethesda, Md.—Z  
 Gaskins Co., 1005 S. Aurora Way, Wheaton, Ill.—X  
 Gavco Labs., 2 East End Ave., New York 21, N.Y.—J  
 GENERAL ELECTRIC CO., Apparatus Div., Schenectady, N.Y.—B,F,J,O,U,V,W,Y,AB  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—A,B,C,M,Y

Genisco, Inc., 2233 Federal Ave., Los Angeles, Calif.—A  
 Giannini & Co., G. M. Pasadena 1, Calif.—A  
 G-M Labs. Inc., 4300 N. Knox Ave., Chicago 41, Ill.—R,V  
 Greibach Research & Devel. Labs., 80 Fryer Terrace, New Rochelle, N.Y.—AA  
 GULTON MFG. CO., 212 Durham Ave., Metuchen, N.J.—A,Y  
 Haledy Electronics Co., 57 Williams St., New York 5, N.Y.—R  
 Hastings Instrument Co Hampton, Va J  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—G,H,P,V  
 Hickok Electrical Instrument Co., 10514 Dupont Ave., Cleveland 8, Ohio—F,M,V,W,AB  
 Hoyt Electrical Instrument Works, 292 Main St., Cambridge 42, Mass.—AB  
 Huppert Co., K. H., 6830 S. Cottage Grove Ave., Chicago 37, Ill.—S  
 Ideal Industries, 3316 Park Ave., Sycamore, Ill.—V  
 Impact-O-Graph Corp., 1900 Euclid Bldg., Cleveland 15, Ohio—A,Y  
 Industrial Electronics, Inc., 8060 Wheeler St., Detroit 10, Mich.—A,Y  
 Industrial Timer Corp., 115 Edison Pl., Newark 5, N.J.—G  
 Instrument Labs., 315 W. Walton Pl., Chicago, Ill.—AB  
 International Research & Devel. Corp., 1027 W. 5 Ave., Columbus 8, Ohio—Y  
 iq Industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—C,H,R  
 Janco Corp., 311 Winona Ave., Burbank, Calif.—AB  
 J-B-T Instruments, 441 Chapel St., New Haven, Conn.—G,S,W  
 KAY ELECTRIC CO., 14 Maple St., Pine Brook, N.J.—S  
 KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—P  
 Kliegl Bros., 321 W. 50 St., New York 19, N.Y.—L  
 Kocour Co., 3504 W. 48 Pl., Chicago 32, Ill.—Q  
 Lab. for Electronics, Inc., 75 Pitts St., Boston, Mass.—F  
 La Motte Chemical Products Co., Baltimore 4, Md.—Q  
 Leeds & Northrup, 4979 Stanton Ave., Philadelphia 44, Pa.—J  
 MacDonald Co., W. S., 33 University Rd., Cambridge 38, Mass.—P  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—R,W  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—O,P,Q,Y,AA  
 Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—G,L,M,P,R  
 Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—A,G  
 MB Mfg. Co., 1060 State St., New Haven 11, Conn.—A,Y  
 MEASUREMENTS CORP., Boonton, N.J.—O  
 Meters, Inc., 5353 N. Keystone Ave., Indianapolis 20, Ind.—S  
 Metron Instrument Co., 432 Lincoln St., Denver 9, Colo.—V  
 Metrotype Corp., 525 W. 76 St., Chicago 20, Ill.—B  
 Micro Balancing, Inc., 191 Herricks Rd., Garden City Park, N.Y.—V  
 Millivac Instrument Corp., 444 2 St., Schenectady, N.Y.—B,P,AB  
 Minn.-Honeywell Regulator Co., Wayne & Windrim Philadelphia 44, Pa.—J,P,Q,S,V,W,X  
 Nilsson Electrical Lab., 103 Lafayette St., New York 13, N.Y.—V,AB  
 North American Philips Co., 750 S. Fulton Ave., Mount Vernon, N.Y.—Q  
 Nuclear Research & Devel. Co., 6425 Etzel Ave., St. Louis 14, Mo.—C,AA  
 Nucleonic Co. of America, 497 Union St., Brooklyn 31, N.Y.—AA  
 Ohmart Corp., 2347 Ferguson Rd., Cincinnati 38, Ohio—E,PA,AA  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—P  
 Philadelphia Scientific Glass Co., 4 Eckard Ave., Abington, Pa.—O,X  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—L,R,U  
 Photobell Co., 116 Nassau St., New York 38, N.Y.—R  
 Photovolt Corp., 95 Madison Ave., New York 16, N.Y.—E,Q  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—H,V  
 Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.—O  
 Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N.Y.—U  
 Pyrometer Instrument Co., 92 Portland Ave., Bergenfield, N.J.—S,W  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—N  
 Rawson Electrical Instrument Co., 117 Potter St., Cambridge 42, Mass.—W  
 R-C Scientific Instrument Co., 307 Culver Blvd., Playa Del Rey Calif.—AA  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—O  
 Richards Co., Arklay S., 37 Winchester St., Newton Highland 61, Mass.—S,W  
 Rich-Roth Labs., 1240 Main St., Hartford 3, Conn.—Z  
 Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—A,L  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—B



Rolab Studios, Walnut Tree Hill, Sandy Hook, Conn.—G  
 Schaevitz Eng'g., Crescent Blvd. & Drexel Ave., Camden 1, N.J.—A  
 Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—P,Y  
 Sensitive Research Instrument Corp., 9 Elm Ave., Mount Vernon, N.Y.—T,W  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—B,P,AB  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—B  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—F,P,W,X,AB  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—Q,W  
 Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—B  
 Sperry Products, Inc., Shelter Rock Rd., Danbury, Conn.—J  
 Standard Electric Time Co., 119 Logan St., Springfield, Mass.—G,H,V  
 Standard Electronic Research Corp., 2 East End Ave., New York 21, N.Y.—J,N,X  
 Stewart Instrument Co., 6507 Grand River, Detroit 8, Mich.—H  
 Sticht Co., Herman H., 27 Park Pl., New York 7, N.Y.—B,V  
 Strandberg Eng'g. Labs., 416 W. Market St., Greensboro, N.C.—O  
 Supreme, Inc., Greenwood, Miss.—AB  
 Taco West Corp., 525 N. Noble St., Chicago 22, Ill.—S,W  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—C  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—X  
 Thermo Electric Mfg. Co., 465 Huff St., Dubuque, Iowa—S  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—C,F,G,H,M,R,V,Z  
 Trans-Sonics, Inc., Bedford Airport, Bedford, Mass.—X  
 Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio—F,N,W,AB  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—W  
 Vibroscope, 6 E. 39 St., New York, N.Y.—Y  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—A,Y,AA  
 Vocaline Co. of America, Inc., Coulter St., Saybrook, Conn.—G  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—B  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—C,Z  
 Weksler Thermometer Corp., 49 W. 32 St., New York 1, N.Y.—X  
 Welch Mfg. Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.—E,L,Q,R,S,V,W,AB  
 Westberg Mfg. Co., 144 S. Coombs St., Napa, Calif.—V  
 Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—Y  
 Western Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—B,L,M,N,O,P,R,S,T,V,X  
 Weston Labs. Inc., Oak Hill Rd., Harvard, Mass.—B,C,H  
 Williams, Brown & Earle, Inc., 904 Chestnut St., Philadelphia 7, Pa.—M

## 55—MICROPHONES

**Handsets, telephone** ..... A  
**Microphones, carbon** ..... B  
**Microphones, condenser** ..... C  
**Microphones, contact** ..... D  
**Microphones, crystal** ..... E  
**Microphones, dynamic** ..... F  
**Microphones, hearing aid** ..... G  
**Microphones, lip** ..... H  
**Microphones, pressure** ..... J  
**Microphones, throat** ..... J  
**Microphones, velocity** ..... K  
**Stethophones** ..... L

Aeronautical Radio Mfg. Co., 155 First St., Mineola, N.Y.—A,B,H,J  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—C,F,I,K  
 American Elite, Inc., 1775 Broadway, New York 19, N.Y.—C  
 American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif.—A,B,E,F,K  
 Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.—B  
 Astatic Corp., 250 Harbor St., Conneaut, Ohio—B,E,F,G  
 Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—C  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—C,F,I,L  
 Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—A,B  
 Barker & Williamson, 237 Fiarfield Ave., Upper Darby, Pa.—C  
 Beam Instruments Corp., 350 Fifth Ave., New York 1, N.Y.—B,C,D,E,F,I,K  
 BELL & HOWELL CO., 7100 McCormick Rd., Chicago 45, Ill.—E,F  
 Bogen Co., David, 29 Ninth Ave., New York 14, N.Y.—E,F  
 British Electronic Sales, 23-03 45 Rd., Long Island, N.Y.—E,F,G,K

Brooks Radio & Television Corp., 84 Vesey St., New York 7, N.Y.—B,E,F  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—C,E,G  
 Communication Devices Co., 2331 12 Ave., New York 27, N.Y.—A,B,H,J  
 Communication Devices Co., 2331 12 Ave., New York 27, N.Y.—A,B,H,J  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—A,B,H  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,B,C,D,E,F  
 Dean Electronics, 35 5 Ave., Brooklyn 17, N.Y.—B  
 DUMONT LABS INC., ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—C,E,F,L  
 DUMONT LABS, INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—C,E  
 Electro, Inc., 425 S. Sandusky St., Delaware, Ohio—E  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—A,B,D,E,F,H,I,J,K  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—A  
 Greibach Research & Devel. Labs., 80 Fryer Terrace, New Rochelle, N.Y.—D,J  
 GULTON MFG. CO., 212 Durham Ave., Metuchen, N.J.—E,F  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—F,K  
 Int'l Research Associates, 221 Warwick Ave., Santa Monica, Calif.—C  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—A,C  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—B  
 MAGNOVOX CO., Fort Wayne 4, Ind.—B  
 Massa Labs, Inc., 5 Fottler Rd., Hingham, Mass.—E  
 Mercury Electro-Products, 622 W. Kinzie St., Chicago 10, Ill.—C  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—A,B,D,E,F,G,H,I,J  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—A  
 Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—A,F  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—B  
 Racon Electric Co., 52 E. 19 St., New York 3, N.Y.—B  
 RADIO CORP. OF AMERICA, RCA VICTOR Div., Front & Cooper Sts., Camden 2, N.J.—E,F,I,K  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—A,C,F  
 Roauwell Corp., 662 Pacific St., Brooklyn 17, N.Y.—A,B,H  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—A  
 Roftan Co., Topsfield, Mass.—B  
 Sears Co., M. J., 52 Clark St., Brooklyn N.Y.—A,B,F,H,I  
 SHURE BROTHERS, INC., 225 W. Huron St., Chicago 10, Ill.—A,B,E,F,G,K  
 Sonotone Corp., Elmsford, N.Y.—E,G  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A,C,E,F,I,K  
 Stephens Mfg. Corp., 8538 Warner Dr., Culver City, Calif.—C

Stromberg-Carlson Co., Rochester 3, N.Y.—A,E,F,I  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,C,D,E,F,G,H,I,J,K  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—A  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—A,B,F  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—A,G  
 Tibbetts Industries, Inc., Camden, Maine—E,G  
 Toys & Specialties, Inc., 622 W. Kinzie St., Chicago 10, Ill.—C  
 Transelectric Mfg., Co., Hopewell Rd., Oxford, Pa.—A  
 TURNER CO., 909 17 St., N.E., Cedar Rapids, Iowa—B,D,E,F,G,I,K  
 Universal Microphone Co., 424 Warren Lane, Inglewood, Calif.—B,E,F,H,J,K  
 UNIVERSITY LOUDSPEAKERS INC., 80 S. Kensico Ave., White Plains, N.Y.—B  
 U. S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—B,C,D,E,F,K  
 Western Mfg., Co., 1400 W. 22nd St., Kearney, Nebr.—B  
 Wheeler Insulated Wire Co., 150 E. Aurora St., Waterbury, Conn.—A  
 Wright Zimmerman, Inc., 330 Fifth Ave., New Brighton, Minn.—F

## 56—MICROPHONE ACCESSORIES

**Microphone booms** ..... A  
**Microphone connectors** ..... B  
**Microphone springs** ..... C  
**Microphone stands** ..... D

Aerolite Electronics Corp., 507 26 St., Union City, N.J.—B  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—D  
 American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif.—A,D  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—B  
 Arey Machine Co., 38 Long Ave., Hillside 5, N.J.—B  
 Art Specialty Co., 3245 W. Lake St., Chicago 24, Ill.—D  
 Astatic Corp., Conneaut, Ohio—D  
 ATLAS SOUND CORP., 1449 39 St., Brooklyn, N.Y.—A,B,D  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—A,B  
 Brillhart Plastic Corp., Box 31, Old Country Rd., Mineola, Long Island, N.Y.  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—A  
 DUMONT LABS INC., ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—A,C,D  
 DUMONT LABS, INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—A,D  
 Eastern Mike-Stand Co., 56 Christopher Ave., Brooklyn 12, N.Y.—D  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—D  
 Glaser-Steers, 2 Main St., Belleville, N.J.—B  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—A  
 Hamilton Electronics Corp., 2726 Pratt Ave., Chicago 45, Ill.—D  
 HOUSTON FEARLESS CORP., 11801 W. Olympic Blvd., Los Angeles 64, Calif.—A  
 Mitchell Industries, Box 17, Mineral Wells, Texas—A  
 Mole-Richardson Co., 937 N. Sycamore Ave., Hollywood 38, Calif.—A  
 Olsen Co., Otto K., 1534 Cahuenga Blvd., Hollywood 28, Calif.—A  
 Petroff, Peter A., 127 Water St., New York 5, N.Y.—B  
 Raco? Electric Co., 52 E. 19 St., New York 3, N.Y.—C  
 RADIO CORP. OF AMERICA, RCA VICTOR Div., Front & Cooper Sts., Camden 2, N.J.—A,B  
 Reevesound Co., 35-54 36th St., Long Island City 3, N.Y.—A  
 Roanwell Corp., 662 Pacific St., Brooklyn 17, N.Y.—A,B,D  
 SHURE BROTHERS, INC., 225 W. Huron St., Chicago 10, Ill.—D  
 Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y.—B  
 S. O. S. Cinema Supply, 602 W. 52 St., New York 19, N.Y.—A  
 Special Products Co., 9115 Brookville Rd., Silver Spring, Md.—D  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A,B,D  
 Starbird, George A., 950 N. Highland Ave., Los Angeles 38, Calif.—A,D  
 Stromberg-Carlson Co., Rochester 3, N.Y.—D  
 Tallen Co., 159 Carlton Ave., B'klyn 5, N.Y.—B  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—A  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—D  
 Tornegren Co., C. W., 236 Pearl St., Somerville, Mass.—A  
 TURNER CO., 909 17 St., N. E., Cedar Rapids, Iowa—D  
 Universal Microphone Co., 424 Warren Lane, Inglewood, Calif.—D  
 U. S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—A,B,D

## COLOR CODES

### Power Transformer Leads:

**Primary** ..... Black  
**Common (tapped primary)** ..... Black  
**Tap (tapped primary)** ..... Black-Yellow  
**Finish (tapped primary)** ..... Black-Red

### Rectifier

**Plate** ..... Red  
**Plate center tap** ..... Red-Yellow  
**Filament** ..... Yellow  
**Filament center tap** ..... Yellow-Blue

### Amplifier

**Filament No. 1** ..... Green  
**Fil. No. 1 center tap** ..... Green-Yellow  
**Filament No. 2** ..... Brown  
**Fil. No. 2 center tap** ..... Brown-Yellow  
**Filament No. 3** ..... Slate  
**Fil. No. 3 center tap** ..... Slate-Yellow

### I-F Transformer Leads:

**Primary plate** ..... Blue  
**Primary B+** ..... Red  
**Secondary grid** ..... Green  
**Secondary grid return** ..... White  
**Full-wave second diode** ..... Violet

### Audio Transformer Leads:

**Primary plate** ..... Blue  
**Primary B** ..... Red  
**Primary plate (push-pull)** ..... Blue or Brown  
**Secondary grid** ..... Green  
**Secondary return** ..... Black  
**Secondary grid (push-pull)** ..... Green or Yellow

57—MOBILE COMMUNICATIONS EQUIPMENT

Citizens radio .....A  
 Intercommunicating systems .....B  
 Pack sets .....C  
 Receivers, fixed .....D  
 Receivers, mobile .....E  
 Telephones, portable field .....F  
 Transceivers .....G  
 Transmitters .....H  
 Walkie-talkies .....I

ABC Radio Labs., 3334 W. New Jersey St., Indianapolis, Ind.—E  
 Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—E,G  
 Aeronautical Radio Mfg., Co., 155 First St., Mineola, N.Y.—E,G,H  
 Air Associates, 511 Joyce St., Orange, N.J.—B,C,D,E,G,H,I  
 Airpax Products Co., P. O. Box 137, Middle River Baltimore 2, Md.—E,H  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—C,G,H,I  
 American Electroengineering Corp., 2040 Colorado Ave., Santa Monica, Calif.—D,E,H  
 Ansley Electronic, Inc., 85 Tremont St., Meriden, Conn.—G,H  
 Approved Electronic Instrument Corp., 928 Broadway, New York 10, N.Y.—D  
 Avia Products Co., 7266 Beverly Rd., Los Angeles 36, Calif.—E,G  
 Babcock Radio Eng'g. Inc., 7942 Woodley Ave., Van Nuys, Calif.—H  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—H  
 Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—H  
 Bassett, Inc., Rex, P. O. Box 1759, Fort Lauderdale, Fla.—D,E,G,H  
 BENDIX RADIO DIV., BENDIX AVIATION CORP., E. Joppa Rd., Towson 4, Md.—E,H,I  
 Berger Communications, 109-01 72 Rd., Forest Hills L. I. N. Y.—D,E,G  
 Bogen Co., David, 29 Ninth Ave., New York 14, N.Y.—B  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—B,F  
 Brillhart Plastic Corp., Box 31, Old Country Rd., Mineola, Long Island, New York—I  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—G,H  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—D,E  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—A,C,D,E,G,H,I  
 CBS—Columbia Inc., 170 53 St., Brooklyn 32, N.Y.—E,H  
 C.G.S. Laboratories, Inc., 391 Ludlow St., Stamford, Conn.—A  
 Communications Co., 300 Greco Ave., Coral Gables, Fla.—D,E,G,H  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—B,C,F,I  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—C,F,I  
 Delco Radio Div., General Motors Corp., Kokomo, Ind.—E  
 Dollar Co., Robert, Communications Equipment Div., 50 Drumm St., San Francisco, Calif.—D,E,H  
 DUMONT LABS., INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—E,H  
 DUMONT LABS., INC., ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—G,H  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—B  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, Long Island, N.Y.—D,E,G,H,I  
 Electro Craft Inc., 68 Jackson St., Stamford, Conn.—I  
 Electronic Research Co., 11550—39 St., N.E., Seattle 55, Wash.—H  
 Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—D,H  
 Electro-Voice, Inc., Cecil and Carroll Sts., Buchanan, Mich.—D,E,H  
 Engineering Associates 434 Patterson Rd., Dayton 9, Ohio—D,E,G  
 Erco Radio Labs., Stewart Ave., Garden City, N.Y.—D,E,H  
 Espey Mfg. Co., 528 E. 72nd St., New York 21, N.Y.—A,C,D,E,G,H,I  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—D,E,H  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,B,D,E,F,G,H,I  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—B,C,D,E,G,H,I  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—D,E,G,H  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—H  
 General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, Long Island, N.Y.—B  
 G & M Equipment Co., 7315 Varna Ave., North Hollywood, Calif.—C,D,E,G,H,I  
 Gonset Co., 801 S. Main St., Burbank, Calif.—E,G,H  
 Hallicrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.—D,E,G,H,I  
 HAMMARLUND MFG. CO., 460 W. 34 St., New York 1, N.Y.—B



Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—B  
 Hastings Instruments, Hampton, Va.—D,E  
 Int'l. Research Corp., 2221 Warwick Ave., Santa Monica, Calif.—E,H  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—E  
 Jefferson, Ray, 40 E. Merrick Rd., Freeport, N.Y.—D,E  
 Johnson Co., E.F., Waseca, Minn.—H  
 Kaar Eng'g Corp., 2995 Middlefield Rd., Palo Alto, Calif.—D,E,G,H  
 Lavoie Labs., Morganville, N.J.—E,G,H  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—A,D,E,G,H  
 Lyseo Mfg., Co., 1401 Clinton St., Hoboken, N.J.—C,D,E,G,H,I  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—C,D,E,G,H,I  
 Marine View Electronics, 744 E 138 St., New York 54, N.Y.—E  
 Mark Products Co., 3547 Montrose Ave., Chicago 18, Ill.—A  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—D,E,H,I  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—H  
 Mitchell Mfg. Co., 2525 Claybourn Ave., Chicago 14, Ill.—B  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—A,C,D,E,G,H,I  
 Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill.—A,C,D,E,G,H,I  
 Northeastern Eng'g. Corp., S. Bedford St., Manchester, N.H.—D,H  
 North Electric Mfg., Co., S. Market St., Galion, Ohio—B  
 Optron Mfg. Co., 3223 N. Sheffield Ave., Chicago 13, Ill.—B  
 Pacific Mercury TV Mfg. Corp., 5955 Van Nuys Blvd., Van Nuys, Calif.—A,C,G,I  
 Pearce-Simpson, Inc., 3023 Coral Way, Miami 34, Fla.—G,I  
 Petroff, Peter A., 127 Water St., New York 5, N.Y.—C,I  
 Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N.Y.—A,G,I  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—I  
 Pratt, Albert, 1939 N. 18 St., Milwaukee 5, Wisc.—E,H  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—D,E,H  
 Radio Apparatus Corp., 55 N. New Jersey St., Indianapolis, Ind.—E  
 RADIO CORP. OF AMERICA, RCA VICTOR Div., Eng'g. Products Div., Camden 2, N.J.—A,D,E,G,H,I  
 Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—G  
 Radio Specialty Mfg. Co., 2023 S.E. 6 Ave., Portland 14, Ore.—C,E,H  
 Railway Communications Inc., Rayton, Mo.—D,E,H  
 RAYTHEON TV & RADIO CORP., 5921 W. Dickens Ave., Chicago 39, Ill.—D,E,G,H,I  
 Remco Mfg. Co., 545 N. LaSalle St., Chicago 10, Ill.—D,E  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—F  
 Reynolds Radio & Equip. Lab., H. B., 219 Stone St., Oneida, N.Y.—E,G,H  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—B,C,F  
 Simpson Mfg. Co., Mark, 32-38 49 St., Long Island City 3, N.Y.—B  
 Slate & Associates, Claude C., 11370 W. Olympic Blvd., Los Angeles 64, Calif.—H  
 Sonar Radio Corp., 3050 W. 21 St., Brooklyn 24, N.Y.—A,C,D,E,G,H,I  
 Spartan Radio—TV, 2400 E. Ganson St., Jackson, Mich.—E  
 Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—D,H,I  
 STANDARD TRANSFORMER CORP., 3580 Eiston Ave., Chicago 18, Ill.—H  
 Stromberg-Carlson Co., Rochester 3, N.Y.—F  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—D,E,F,G,H,I  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—B,F  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—A,D,E,F,G,H,I  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—D,E,I  
 Transmitter Equipment Mfg. Co., 345 Hudson St., New York 14, N.Y.—B,D,E,G,H  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—C,D,E,G,H,I  
 Webster Electric Co., 1900 Clark St., Racine, Wisc.—B  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—D,E,H  
 Western Mfg., Co., 1400 W. 22 St., Kearney, Nebr.—B,D,E,G,H,I,R  
 White Industries, 421 W. 54 St., New York 19, N.Y.—E,G,H

58—MOBILE COMMUNICATIONS ACCESSORIES

Antennas .....A  
 Antenna bases .....B  
 Auto alarms .....C  
 Control equipment .....D  
 Crystals .....E  
 Microphones .....F  
 Power supplies .....G  
 Power supplies, emergency .....H  
 Recorders, film .....I  
 Vibration mountings .....J

Accurate Eng'g. Co., 2005 Blue Island Ave., Chicago 8, Ill.—G,H  
 Acorn Electronics Corp., Box 348, Gibson City, Ill.—G  
 Aeronautical Electronics Inc., Raleigh-Durham Airport, Raleigh, N.C.—E  
 Aeronautical Radio Mfg. Co., 155 1 St., Mineola, N.Y.—A,B,E,F,G  
 Ainslie Electronic Products, 312 Quincy Ave., Quincy, Mass.—A,B  
 Airpax Products Co., P. O. Box 137, Middle River, Baltimore 2, Md.—G,H  
 Air Associates, 511 Joyce St., Orange, N.J.—D,G,H  
 Alpar Mfg. Corp., P. O. Box 152, Redwood City, Calif.—B  
 Alprodec Inc., Box 94, Mineral Wells, Tex.—A,B  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—D,G  
 American Electric Motors, 4811 Telegraph Rd., Los Angeles, Calif.—G  
 American Electroengineering Corp., 2040 Colorado Ave., Santa Monica, Calif.—G  
 American Machine & Fdry. Co., 1085 Commonwealth Ave., Boston, Mass.—A,B  
 American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif.—F  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—A  
 American Radiotelephone Co., St. Petersburg, Fla.—D  
 Ansley Electronics Inc., 85 Tremont St., Meriden, Conn.—A  
 Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.—F  
 Art-Lloyd Metal Products Corp., 2973 Cropsey Ave., Brooklyn 14, N.Y.—B,J  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—I  
 Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—F  
 Babcock Radio Eng'g. Inc., 7942 Woodley Ave., Van Nuys, Calif.—A,C,G  
 Barry Corp., 761 Pleasant St., Watertown 72, Mass.—J  
 BENDIX RADIO DIV., BENDIX AVIATION CORP., E. Joppa Rd., Towson 4, Md.—A  
 BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa.—E  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—A,C,D  
 Brecco Electronics Corp., 55 Vandam St., New York 13, N.Y.—C  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A  
 Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles 34, Calif.—G  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—A,B  
 Buggie & Co., H. H., 726 Stanton St., Toledo 4, Ohio—A  
 Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—G  
 CARTER MOTOR CO., 2644 N. Maplewood Ave., Chicago 47, Ill.—G  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—I,J  
 Century Geophysical Corp., 1333 N. Utica, Tulsa, Okla.—I  
 Conn. Marine Instrument Co., Essex, Conn.—A,F,G,J  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—G,H  
 Costelow Co., J. A., 125 Kansas Ave., Topeka, Kan.—A,F,G,H  
 Dorne & Margolin, 30 Sylvester St., Westbury, N.Y.—A  
 Dubrow Development Co., 235 Penn St., Burlington, N.J.—G  
 Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.—G  
 Eidson Electronic Co., 1902 N. 3 St., Temple, Tex.—E  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—D,G,H  
 Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—G  
 Electro-Voice Inc., Cecil & Carroll Sts., Buchanan, Mich.—F  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A,B,D  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Tex.—D,G  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—C,D,G,H  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—D  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—A,G

Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—I  
 Finn & Co., T. R., 333 Jackson Ave., Bronx 54, N.Y.—J  
 Flight Research Inc., P. O. Box 1-F, Richmond, Va.—I  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—D,G,H  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—G,H  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—C  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—C  
 Georator Corp., Manassas, Va.—G,H  
 Glaser-Steers Corp., 2 Main St., Belleville, N.J.—D  
 GULTON MFG. CORP., 212 Durham Ave., Metuchen, N.J.—E  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—D  
 Hastings Instrument, Hampton, Va.—A,D,G  
 HOUSTON FEARLESS CORP., 11801 W. Olympic Blvd., Los Angeles 64, Calif.—A,I  
 Hoyt Electrical Instrument Works, 292 Main St., Cambridge 42, Mass.—A,B  
 Inet, Inc., 8655 S. Main St., Los Angeles 3, Calif.—G,H  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—A  
 Int'l. Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—D  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—A,G  
 Kaar Eng'g. Corp., 2995 Middlefield Rd., Palo Alto, Calif.—E  
 Kepco Labs., 131-38 Sanford Ave., Flushing 55, N.Y.—G,H  
 Kinevox Inc., 116 S. Hollywood Way, Burbank, Calif.—G  
 KNIGHTS CO., JAMES, Sandwich, Ill.—E  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—A,B,D,F,G,H,J  
 Lord Mfg. Co., 1635 W. 12 St., Erie, Pa.—J  
 McColin-Christie Corp., 3410 W. 67 St., Los Angeles 43, Calif.—G  
 Mag-Electric Products Inc., 14405 Crenshaw Ave., Gardiner, Calif.—G,H  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—G  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—J  
 Mark Products Co., 3547 Montrose Ave., Chicago 18, Ill.—A,B  
 Maurer Inc., J. A., 37-01 31 St., Long Island City, N.Y.—I  
 MB Mfg. Co., 1060 State St., New Haven 11, Conn.—J  
 Metal Textile Corp., Roselle, N.J.—J  
 Midco Mfg. & Distr. Co., 13 & Kentucky, Sheboygan, Wis.—G,H  
 Midwestern Geophysical Lab., 3401 S. Harvard, Tulsa, Okla.—I  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—F,I  
 Minn. Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis 16, Minn.—J  
 Miskella Infra-Red Co., E. 73 & Grand Ave., Cleveland 4, Ohio  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—D,F,G,H  
 Motor Generator Corp., Hobart Sq., Troy, Ohio—G  
 Motorola Inc., 4545 W. Augusta Blvd., Chicago, Ill.—A,D  
 National Electric Products Corp., 338 14 St., Ambridge, Pa.—A  
 National Electronic Mfg. Corp., 42-08 Vernon Blvd., Long Island City 1, N.Y.—A,D  
 Nebel Lab., R. E., 1104 Lincoln Pl., Brooklyn 13, N.Y.—E  
 Neutronic Associates, 83-56 Victor Ave., Elmhurst 73, N.Y.—G,H  
 Northeastern Eng'g. Corp., So. Bedford St., Manchester, N.H.—D,G  
 Onan & Sons, D. W., University Ave., S.E. at 25th, Minneapolis 14, Minn.—G,H  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—G,H  
 Pearce-Simpson Inc., 3023 Coral Way, Miami 34, Fla.—A  
 Perkin Eng'g. Corp., 345 Kansas St., El Segundo, Calif.—C  
 Permotax Corp., 4900 W. Grand Ave., Chicago 39, Ill.—F  
 Petroff, P. A., 127 Water St., New York 5, N.Y.—A,B,D  
 Phila. Scientific Glass Co., 4 Eckard Ave., Abington, Pa.—D  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—B,G  
 Portable Electric Tools Inc., 200 W. 83 St., Chicago 20, Ill.—G  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—A,D,G  
 Precision Crystal Lab., 2223 Warwick Ave., Santa Monica, Calif.—E  
 Radiart Corp., 3455 Vega Ave., Cleveland 13, Ohio—A,G  
 Radio Apparatus Corp., 55 N. New Jersey St., Indianapolis, Ind.—A  
 RADIO CORP. OF AMERICA, RCA Victor Div. Eng'g. Products Div., Camden 2, N.J.—A,B,D,E,F,J  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—A,B  
 Railway Communications Inc., Raytown, Mo.—A,D  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—G,I

Regulator Eng'g. & Devel. Co., 11545 W. Jefferson Blvd., Culver City, Calif.—G  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—F  
 Roanwell Corp., 662 Pacific St., Brooklyn 17, N.Y.—F  
 ROBINSON AVIATION INC., Teterboro Air Terminal, Teterboro, N.J.—J  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—D,F,G,H  
 Schauer Mfg. Co., 4500 Alpine Ave., Cincinnati 36, Ohio—G  
 Sears Co., M. J., 52 Clark St., Brooklyn 2, N.Y.—F  
 Sonar Radio Corp., 3050 W. 21 St., Brooklyn 24, N.Y.—G,H  
 Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.—G  
 Spartan Radio Television, 2400 E. Ganson St., Jackson, Mich.—G  
 Standard Crystal Co., 1714 Locust St., Kansas City, Mo.—E  
 Stromberg-Carlson Co., Rochester 3, N.Y.—F,G  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,E,F,G,J  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 21, N.Y.—F,G  
 Thomas & Sons Co., R. Lisbon, Ohio—B  
 Tibbetts Industries, Camden, Me.—F  
 Torngren Co., C. W., 236 Pearl St., Somerville, Mass.—A  
 Transformer Technicians, 2608 N. Cicero Ave., Chicago 39, Ill.—G  
 TURNER CO., 909 17 St., N. E., Cedar Rapids, Iowa—F  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—G,H  
 U. S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—F,G  
 Ward Products Corp., Div. Gabriel Co., 1148 Euclid Ave., Cleveland 15, Ohio—A,B  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—A,B  
 Western Electronic Enterprises, 3348 W. Compton Blvd., Gardena, Calif.—A  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Neb.—A,F  
 White Industries, 421 W. 54 St., New York 19, N.Y.—G  
 White & Son, J. L., 374 Verona Ave., Newark 4, N.J.—A  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—A  
 WORKSHOP ASSOCIATES DIV., Gabriel Co., Endicott St., Norwood, Mass.—A

### 59—MOTION PICTURE EQUIPMENT

Cameras, 16 mm ..... A  
 Cameras, 35 mm ..... B  
 Kinescope recording apparatus .... C  
 Projectors, 16 mm ..... D  
 Projectors, 35 mm ..... E  
 Projectors, rear ..... F  
 Projectors, theatre TV ..... G  
 Sound readers ..... H  
 Tape, synchronized magnetic ..... I

Akeley Camera & Instrument Corp., 345 Hudson St., New York, N.Y.—A,B  
 AMPEX ELECTRIC CORP., 934 Charter St., Redwood City, Calif.—I  
 Ampro Corp., 2835 N. Western Ave., Chicago 18, Ill.—D,F,G  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—I  
 Austin Co., 76 9 Ave., New York 11, N.Y.—C  
 Background Engineers, 7313 Santa Monica Blvd., Hollywood 46, Calif.—E,F  
 Baughman Co., E. J., 350 S. Central, Los Angeles 13, Calif.—F,G,H  
 BELL & HOWELL CO., 7100 McCormick Rd., Chicago 45, Ill.—A,B,D,F  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—A,C,D  
 Bodde Screen Co., 8829 Venice Blvd., Los Angeles 34, Calif.—F  
 Buhl Optical Co., 1009 Beech Ave., Pittsburgh 12, Pa.—C,E  
 BURKE & JAMES, 321 S. Wabash Ave., Chicago 4, Ill.—B  
 Calvin Co., 1105 Truman Rd., Kansas City 6, Mo.—D  
 CAMERA EQUIPMENT CO., 1600 Broadway, New York 19, N.Y.—A,B,D,E,F,H  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—A,B,D,E,F,H,I  
 Century Projector Corp., 729 7 Ave., New York 19, N.Y.—E,F,G  
 Cinematic Devel. & Cinechrome Lab., 2125 32 Ave., San Francisco, Calif.—A,B  
 Cinetech Co., Inc., 106 West End Ave., New York 23, N.Y.—A,B  
 Colonial Films, 2118 Mass. Ave., N. W., Washington 8, D.C.—A,C  
 Consolidated Producing, 540 W. Congress St., Detroit 26, Mich.—A,B  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—G  
 DeVry Corp., 1111 Armitage Ave., Chicago 14, Ill.—D,E,F  
 DUMONT LABORATORIES, INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—D

DUMONT LABS., INC., ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—C,D,E  
 Eastman Kodak Co., 348 State St., Rochester 4, N.Y.—A,B,C  
 Edgerton, Germeshausen & Grier, 160 Brookline Ave., Boston 15, Mass.—A  
 E D L Co., 5929 E. Dunes Highway, Gary 5, Ind.—H  
 Electro Vision Laboratory, 30-16 Crescent St., Long Island City 2, N.Y.—I  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—A,B  
 FAIRCHILD RECORDING EQUIPMENT CORP., 154 St. & 7 Ave., Whitestone, N.Y.—I  
 Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—D  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—I  
 Flight Research, Inc., P. O. Box 1-F, Richmond, Va.—A,B  
 Gates & Co., George W., Franklin Square, L.I., N.Y.—D  
 Gale Dorothea Mechanisms, 81-01 Broadway, Elmhurst, Long Island, N.Y.—D,I  
 GENERAL PRECISION LABORATORY, 63 Bedford Rd., Pleasantville, N.Y.—C,D,E,F,G  
 Golde Mfg. Co., 4888 N. Clark St., Chicago 40, Ill.—F  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—H  
 Handy Organization, Jam, 2821 E. Grand Blvd., Detroit, Mich.—A  
 Holmes Projector Co., 1815 N. Orchard St., Chicago 14, Ill.—F  
 Int'l. Projector Corp., 55 LaFrance Ave., Bloomfield, N.J.—E  
 Kinevox Inc., 116 S. Hollywood Way, Burbank, Calif.—H  
 Korb Engr. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—I  
 Land-Air, Inc., 440 W. Superior St., Chicago 10, Ill.—A,B  
 LAS-LAB, 316 W. Saratoga St., Baltimore 1, Md.—A,B  
 Libra Film & Equipment, 6525 Sunset Blvd., Hollywood 28, Calif.—A  
 McClure Talking Pictures, O. J., 1115 W. Washington Blvd., Chicago 7, Ill.—H  
 Maurer, Inc., J. A., 37-01 31 St., Long Island City 1, N.Y.—A,B  
 Michigan Film Library, 15745 Rosemont Rd., Detroit 23, Mich.—A  
 Mitchell Camera Corp., 666 W. Harvard St., Glendale 4, Calif.—A,B  
 Motiograph, Inc., 4431 W. Lake St., Chicago 24, Ill.—D,E,G  
 Moviola Mfg. Co., 1451 Gordon St., Hollywood 28, Calif.—H  
 Natural Lighting Corp., 1124 E. Colo. Blvd., Glendale 5, Calif.—A  
 Optron Mfg. Co., 3223 N. Sheffield Ave., Chicago 13, Ill.—M  
 Paillard Projects, 265 Madison Ave., New York 16, N.Y.—A,D  
 Paramount TV Productions, Paramount Bldg., New York 18, N.Y.—C  
 Pembrex Theatre Supply Corp., 1969 S. Vermont Ave., Los Angeles 7, Calif.—F  
 Precision Products Inc., 719 17 St., N. W., Washington, D.C.—A  
 Producers Sales Corp., 2704 W. Olive Ave., Burbank, Calif.—A,B,C,D,E,F  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., Front & Cooper St., Camden 2, N.J.—D,E,I  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—I  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—C,H,I  
 REEVES SOUND CRAFT CORP., 10 E. 52 St., New York 22, N.Y.—I  
 S.O.S. Cinema Supply Corp., 602 W. 52 St., New York 19, N.Y.—A,B,C,D,E,F,H,I  
 Special Effects & Equip. Inc., 418 W. 54 St., New York 19, N.Y.—F  
 Spellman Television Co., 3029 Webster Ave., Bronx 67, N.Y.—G  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—I  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—G  
 Swank Films, 19 W. 4th St., Dayton 2, Ohio—A,B  
 Synchromatic Prods., 766 Broadway, Bayonne, N.J.—F  
 T-Bar-V Inc., "Backgrounds Unlimited," 5919 Hollywood Blvd., Hollywood 28, Calif.—D,E,F  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—C,G  
 Telefax, 5919 Hollywood Blvd., Hollywood 28, Calif.—D,F  
 Television Cartoons, Inc., 155 W. 46 St., New York, N.Y.—A,B  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—A,D,F,H,I,L  
 Trans-Lux Corp., 1270 Ave. of the Americas, New York 20, N.Y.—F  
 Victor Animatograph Corp., P. O. Box 600, Davenport, Iowa—D  
 Wenzel Projector Co., 2511 S. State St., Chicago 16, Ill.—E  
 Westrex Corp., 111 Eighth Ave., New York 11, N.Y.—A,B,D,E,F  
 Williams, Brown & Earle, Inc., 904 Chestnut St., Philadelphia 7, Pa.—A,B,D,F,I  
 Willson Camera Co., 1401 Lawrence Rd., Havertown, Pa.—B,E

**60—MOTION PICTURE  
EQUIPMENT ACCESSORIES**

- Animation equipment .....A
- Cue markers .....B
- Editing equipment .....C
- Film scrapers .....D
- Lenses .....E
- Optical apparatus .....F
- Printing equipment .....G
- Processing equipment .....H
- Rapid development equipment .....I
- Reels, continuous projection .....J
- Rewinds, auto .....K
- Screens, background .....L
- Screens, projection .....M
- Special effects equipment .....N
- Splicing equipment .....O
- Titling equipment .....P
- Viewfinders .....Q

Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N.Y.—B,D,O  
 Affiliated Photographic Co., 21 W. 45 St., New York 19, N.Y.—F  
 Akeley Camera & Instrument Corp., 345 Hudson St., New York, N.Y.—A,C,E  
 American Optical Co., Buffalo 15, N.Y.—E,F  
 Ampro Corp., 2835 N. Western Ave., Chicago 18, Ill.—J  
 Audio-Tone Oscillator Co., 6511 Main St., Long Hill, Conn.—C  
 Background Engineers, 7313 Santa Monica Blvd., Hollywood 46, Calif.—L  
 Baia Motion Picture Eng'g., 120 Victor Ave., Detroit 3, Mich.—C,K,O  
 Barnes Development Co., 218 W. Baltimore Pike, Lansdowne, Pa.—F  
 Bar-Ray Products Inc., 209 25 St., Brooklyn 32, N.Y.—H  
 Baughman Co., E. J., 350 S. Central, Los Angeles 13, Calif.—K,Q  
 Bausch & Lomb Optical Co., 628 St. Paul St., Rochester, N.Y.—E,F  
 Beeland-King Film Productions, 752 Spring St., N.W., Atlanta, Ga.—A,C,P  
 BELL & HOWELL CO., 7100 McCormick Rd., Chicago 45, Ill.—A,C,D,E,F,G,K,M,O,Q  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—C,F,Q  
 Beseler Co., Chas., 60 Badger St., Newark 8, N.J.—F  
 Bodde Screen & Projector Co., 8829 Venice Blvd., Los Angeles 34, Calif.—G,L,M,N  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—F  
 Buhl Optical Co., 1009 Beach Ave., Pittsburgh 12, Pa.—E,F,M  
 BURKE & JAMES, 321 S. Wabash Ave., Chicago 4, Ill.—E,F,I  
 CAMERA EQUIPMENT CO., 1600 Broadway, New York 19, N.Y.—A,B,C,D,E,F,G,H,I,K,L,M,N,O,Q  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—A,B,C,E,F,G,H,L,M,N,O,P,Q  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—F  
 Century Projector Corp., 729 7 Ave., New York 19, N.Y.—E,P  
 Cineffects, Inc., 115 W. 45 St., New York 19, N.Y.—A,C,E,F  
 Cinematic Devel. & Cinechrome Lab., 2125 32 Ave., San Francisco, Calif.—C,E,F,G,H,M,N,O,P,Q  
 Colonial Films, 2118 Mass. Ave., N.W., Washington 8, D.C.—A,E,H  
 Compeo Corp., 2251 W. St. Paul Ave., Chicago 47, Ill.—J  
 De-Lite Screen Co., 2711 N. Pulaski Rd., Chicago 29, Ill.—L  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—E,F  
 Eastman Kodak Co., 348 State St., Rochester 4, N.Y.—C,D,E,F,M  
 E D L Co., 5929 E. Dunes Highway, Gary 5, Ind.—G,H,I  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—F,I,Q

**TV-Set Production  
at Annual Rate of 9 Million**

Production of television receivers attained an annual rate of more than nine million sets in the first quarter of 1953, reports RTMA.

First quarter production of TV sets at 2.3 million compared with 1.3 million sets in the same 1952 period. Output of radio receivers in the first three months of 1953 totalled 3.8 million as against 2.3 million sets manufactured in the corresponding 1952 period.



Fish-Schurman Corp., 70 Portman Rd., New Rochelle, N.Y.—E,F  
 Gale Dorothea Mechanisms, 81-01 Broadway, Elmhurst, L.I., N.Y.—A  
 Golde Mfg. Co., 4888 N. Clark St., Chicago 40, Ill.—K,N  
 Griswold Machine Works, 412 Main St., Port Jefferson, N.Y.—O  
 Gundlach Mfg. Co., Fairport, N.Y.—E  
 Handy Organization, Jam, 2821 E. Grand Blvd., Detroit, Mich.—E,M,N,O,P,Q  
 HOUSTON FEARLESS CORP., 11801 W. Olympic Blvd., Los Angeles 64, Calif.—G,H,I,K  
 Hycor Co., 11423 Vanowen St., N. Hollywood, Calif.—N  
 Kinevox Inc., 116 S. Hollywood Way, Burbank, Calif.—O  
 Kollmorgen Optical Corp., 30 Church St., New York 7, N.Y.—E,F,G  
 KOLLSMAN INSTRUMENT CORP., Elmhurst, N.Y.—F  
 Las-Lab, 316 W. Saratoga St., Baltimore 1, Md.—F  
 Lektra Labs., Inc., 154 11 Ave., New York 11, N.Y.—O  
 Levins Eng'g. Co., 8203 Cedar St., Silver Spring, Md.—F  
 Libra Film & Equipment, 6525 Sunset Blvd., Hollywood 28, Calif.—C,D,E,M,O,P  
 Linick Chemical Co., 59 E. Madison St., Chicago 3, Ill.—O  
 Maurer, Inc., J. A., 37-01 31 St., Long Island City 1, N.Y.—A,O,Q  
 Merix Chemical Co., 1021 E. 55 St., Chicago 15, Ill.—F  
 Meyer-Opticraft, Inc., 39 W. 60 St., New York 23, N.Y.—E,Q  
 Mich. Film Library, 15745 Rosemont Rd., Detroit 23, Mich.—M  
 Minn. Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.—O  
 Mitchell Camera Corp., 666 W. Harvard St., Glendale 4, Calif.—E  
 Natural Lighting Corp., 1124 E. Colo. Blvd., Glendale 5, Calif.—Q  
 National Sound Projector, 8044 N. Ridgeway, Skokie, Ill.—E  
 Nemeth Studios, Ted, 729 7 Ave., New York 19, N.Y.—C  
 Neumade Products Corp., 330 W. 42 St., New York 36, N.Y.—B,C,D,K,O  
 Pacific Optical Corp., 5965 W. 98 St., Los Angeles 45, Calif.—F  
 Pacific Universal Products Corp., 168 Vista Ave., Pasadena 8, Calif.—E,F,N  
 Paillard Products, 265 Madison Ave., New York 16, N.Y.—A,E,O,P,Q  
 Pancro Mirrors, Inc., 2958 Los Feliz Blvd., Los Angeles 39, Calif.—E  
 Par Products Corp., 926 N. Citrus Ave., Hollywood 38, Calif.—E,F,G,Q  
 Peck & Harvey, 5650 N. Western, Chicago, Ill.—H  
 Petrick Bros., 1938 N. Springfield Ave., Chicago 47, Ill.—M  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—E  
 Photo Research Corp., 127 W. Alameda Ave., Burbank, Calif.—Q  
 Precision Film Labs., 21 W. 46 St., New York 36, N.Y.—C,G,H,O  
 Precision Products, 719 7 St., N.W., Washington, D.C.—E,F,H,I  
 Prestoseal Mfg. Corp., 37-27 33 St., Long Island City 1, N.Y.—C,O  
 Producers Sales Corp., 2704 W. Olive Ave., Burbank, Calif.—A,G,N  
 Projection Optics Co., 330 Lyell Ave., Rochester 6, N.Y.—E,F  
 Q-O-S Corp., 39 W. 60 St., New York 23, N.Y.—E,F  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—C  
 Raven Screen Co., 124 E. 124 St., New York 35, N.Y.—M  
 Raytone Screen Corp., 165 Clermont Ave., Brooklyn 5, N.Y.—M  
 Republic Lens, 916 9 Ave., New York, N.Y.—E  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—C,F,G,J,N  
 Rolab Studios, Walnut Tree Hill, Sandy Hook, Calif.—A,C,F,P  
 Saftco Glass Co., 4717 Stenton Ave., Philadelphia 44, Pa.—E  
 Semon Bache & Co., 636 Greenwich St., New York 14, N.Y.—E  
 Simpson Optical Mfg. Co., 3200 W. Carroll Ave., Chicago 24, Ill.—E  
 S.O.S. Cinema Supply Co., 602 W. 52 St., New York, N.Y.—A,B,C,D,E,F,G,H,I,K,L,M,N,O,P,Q  
 Special Effects & Equipment Inc., 418 W. 54 St., New York 19, N.Y.—L,N  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—J  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—E

Swank Films, 19 W. 4 St., Dayton 2, Ohio—A, E,G,H  
 Synchronatic Prods., 766 Broadway, Bayonne, N.J.—A,B,C,N,O  
 T-Bar-V Inc., "Backgrounds Unlimited," 5919 Hollywood Blvd., Hollywood 28, Calif.—E,L,M,N  
 Teleflex, 5919 Hollywood Blvd., Hollywood 28, Calif.—L,M,N  
 Telemated Cartoons, 70 E. 45 St., New York, N.Y.—A  
 Television Associates, E. Michigan St., Michigan City, Ind.—A  
 Television Cartoons, Inc., 155 W. 46 St., New York, N.Y.—A,C,E  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—B,C,E,F,I,J,M,N,O,P,Q  
 Trans-Lux Corp., 1270 Ave. of the Americas, New York 20, N.Y.—L,M  
 Universal Reels, 9-10 37 Ave., Long Island City, N.Y.—J  
 Vocalite Screen Corp., 19 Debevoise Ave., Roosevelt, N.Y.—M  
 Wenzel Projector Co., 2511 S. State St., Chicago 16, Ill.—C,K  
 Westrex Corp., 111 8 Ave., New York 11, N.Y.—D,E,F,G,H,L,M,N,Q  
 Williams Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—B,C,D,E,F,G,H,I,J,K,L,M,P,Q  
 Williams Screen Co., 1674 Summit Lake Blvd., Akron 7, Ohio—M  
 Willson Camera Co., 1401 Lawrence Rd., Havertown, Pa.—H,M  
 WOLLENSAK OPTICAL CO., 850 Hudson Ave., Rochester 21, N.Y.—E  
 Woodwelding, Inc., 3000 W. Olive Ave., Burbank, Calif.—I  
 Zenith Optical Lab., 1920 Great Neck Rd., Copaugue, N.Y.—E,F

**61—MOTION PICTURE FILM**

- Film, magnetic stripe .....A
- Film, raw stock .....B
- Film storage .....C

Anso Div., General Aniline & Film Corp., Binghamton, N.Y.—B  
 AUDIO DEVICES, INC., 444 Madison Ave., New York 22, N.Y.—A  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—A  
 Bar-Ray Products, Inc., 209-25th St., Brooklyn 32, N.Y.—C  
 BELL & HOWELL CO., 7100 McCormick Rd., Chicago 45, Ill.—A  
 CAMERA EQUIPMENT CO., 1600 Broadway, New York 19, N.Y.—A,B,C  
 Cinematic Development & Cinechrome Lab., 2125 32 Ave., San Francisco, Calif.—B  
 Colonial Films, 2118 Mass. Ave., N.W. Washington 8, D.C.—B,C  
 Compeo Corp., 2251 W. St. Paul Ave., Chicago 47, Ill.—C  
 DuPont de Nemours & Co., E. I., 10 & Market Sts., Wilmington 98, Del.—B  
 Eastman Kodak Co., 348 State St., Rochester 4, N.Y.—B,C  
 E D L Co., 5929 E. Dunes Highway, Gary 5, Ind.—A  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—A  
 Merix Chemical Co., 1021 E. 55 St., Chicago 15, Ill.—C  
 Moviola Mfg. Co., 1451 Gordon St., Hollywood 28, Calif.—B  
 Nemeth Studios, Ted, 729 Seventh Ave., New York 19, N.Y.—B  
 Neumade Products Corp., 330 W. 42 St., New York 36, N.Y.—C  
 Peerless Film Processing Corp., 165 W. 46 St., New York 36, N.Y.—C  
 REEVES SOUNDRAFT CORP., 10 E. 52 St., New York 22, N.Y.—A  
 S.O.S. Cinema Supply Corp., 602 W. 52 St., New York 19, N.Y.—C  
 Swank Films, 19 W. 4th St., Dayton 2, Ohio—C,B  
 Television Cartoons, Inc., 155 W. 46th St., New York, N.Y.—C  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—C  
 Westrex Corp., 111 Eighth Ave., New York 11, N.Y.—A,C  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—A,B,C

**TV & Radio Output Up**

Production in March, a five-week period, showed 810,112 TV sets and 1,549,203 radios compared with 510,561 TV sets and 975,892 radios manufactured in the same 1952 month. Broken down, March radio-set output ran: Home sets, 442,101; portables, 177,656; auto, 654,367, and clock-radios, 275,079.

## 62—MOTORS & GENERATORS

Alternators	A
Converters	B
Couplings, flexible	C
Couplings, rigid	D
Dynamotors	E
Engines, gas	F
Generators, AC	G
Generators, DC	H
Generators, hand-crank	I
Generators, high frequency power	J
Motors, AC	K
Motors, control	L
Motors, DC	M
Motors, miniature	N
Motors, servo	O
Motors, timing	P
Motors, turntable	Q
Power plants	R
Starters	S

Aeronautical Radio Mfg. Co., 155 First St., Mineola, N.Y.—E  
Airborne Accessories Corp., 1414 Chestnut Ave., Hillside 5, N.J.—H,K,N  
Airflyte Electronics Co., 21 Cottage St., Bayonne, N.J.—N  
AIR-MARINE MOTORS, INC., 3939 Merrick Rd., Seaford, N.Y.—K,N,O  
Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio—K,L,N,P,Q  
Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—F  
Allis Co., Louis, 427 E. Stuart St., Milwaukee 7, Wisc.—A,B,E,G,H,J,L,M  
American Electric Motors, 4811 Telegraph Rd., Los Angeles 22, Calif.—A,B,G,J,K,N,O  
Amglo Corp., 2037 W. Division St., Chicago 22, Ill.—H,P  
Arma Corp., Roosevelt Field, Garden City, N.Y.—G,K,L,M,N,O  
Barber-Colman Co., 1300 Rock St., Rockford, Ill.—H,K,M,N  
Beam Instruments Corp., 350 Fifth Ave., New York 1, N.Y.—A,B,F,R  
BENDIX AVIATION CORP., Red Bank Division, Eatontown, N.J.—A,E,G,M,O,P  
Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—B  
Bodine Electric Co., 2254 W. Ohio St., Chicago 40, Ill.—K,L,M,N,O,P  
Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N.J.—A,B,C,G,H,J,M,R  
British Industries Corp., 164 Duane St., New York 13, N.Y.—K  
Brooks Radio & T.V. Corp., 84 Vesey St., New York 7, N.Y.—K  
Buda Co., 154 & Commercial Aves., Harvey, Ill.—F,R  
B/W Controller Corp., 2200 E. Maple Rd., Birmingham, Mich.—S  
CARTER MOTOR CO., 2644 N. Maplewood Ave., Chicago 47, Ill.—A,B,E,G,H,R  
Century Electric Co., 1806 Pine St., St. Louis 3, Mo.—B,G,H,K,M,R  
Clark Controller Co., 1146 E. 152 St., Cleveland 10, Ohio—S  
Columbia Electric Mfg. Co., 4519 Hamilton Ave., Cleveland 14, Ohio—E,G,H  
Communication Devices Co., 2331 12 Ave., New York City 27, N.Y.—B,E,H,I,M  
Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—I,N  
Continental Electric Co., 325 Ferry St., Newark 5, N.J.—A,B,E,G,H,K,M  
Controlelectric, P. O. Box 68, Gracie Station, New York City 26, N.Y.—B,K  
Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., South Plainfield, N.J.—B  
Cramer Co., Box 49, Centerbrook, Conn.—N,P  
Dalmotor Co., 1375 Clay St., Santa Clara, Calif.—G,L,M,O  
Delco-Remy Div.—General Motors Corp., P. O. Box 640, Anderson, Ind.—G,H,S  
Diehl Mfg. Co., 1186 FINDERNE AVE., Somerville, N.J.—K,L,M,N,O  
Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—O  
D. & R. Ltd., 402 Gutierrez St., Santa Barbara, Calif.—A,E  
Eagle Signal Corp., 202 20 St., Moline, Ill.—P  
Eastern Air Devices, 585 Dean St., Brooklyn 17, N.Y.—A,H,K,N,O  
ECLIPSE-PIONEER DIV., Bendix Aviation Corp., Teterboro, N.J.—E,H,L,O  
Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.—A,B,E,G,M,N,O,P  
Eisler Eng'g. Co., 770 S. 13, Newark, N.J.—Q  
Electric Specialty Co., 211 South St., Stamford, Conn.—A,B,E,G,H,K,M  
Electro Craft Inc., 68 Jackson St., Stamford, Conn.—A,E,G,H,K,L,M,N,O  
Electro Eng'g. Products, 609 W. Lake St., Chicago 10, Ill.—E  
Electro Tech Corp., 4 Romanelli Ave., S. Hackensack, N.J.  
Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—P  
Electyeme Motor Products, Genoa, Ill.—P  
Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—E,G,H,K,M,N,O,Q

FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—E,K,L,M,N,O,P,Q  
FORD INSTRUMENT CO., 31-10 Thomson Ave., Long Island City 1, N.Y.—L,O  
GALBRAITH & SON., 450 6 Ave., New York 11, N.Y.—S  
Gale Dorothea Mechanisms, Inc., 81-01 Broadway, Elmhurst, Long Island, N.Y.—K,L,N,Q,P  
General Armature & Mfg. Co., P. O. Box 370, Lock Haven, Pa.—H,S  
GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B,E,G,H,K,M,O,P,Q  
General Industries Co., Elyria, Ohio—Q  
General Magnetics, 135 Bloomfield Ave., Bloomfield, N.J.—B  
Georator Corp., Manassas, Va.—A,B,G,H,I,J,R  
Gleason-Avery, Inc., 45 Aurelius Ave., Auburn, N.Y.—K,N,P,Q  
Globe Industries, 125 Sunrise Place, Dayton 7, Ohio—K,M,N,O  
G-M Laboratories, Inc., 4300 N. Knox Ave., Chicago 41, Ill.—O  
Haft & Sons, 950 Kent Ave., B'klyn. 5, N.Y.—Q  
Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—B  
Hallett Mfg. Co., 1601 W. Florence Ave., Inglewood, Calif.—G,H  
Hansen Mfg. Co., 1934 Virgil Blvd., Princeton, Ind.—K,M,N,O,P,Q  
Haydon Co., A. W., 235 N. Elm St., Waterbury 20, Conn.—P  
Hercules' Elec. Mach'y. & Equip. Co., 1442 E. Washington Blvd., Los Angeles, Cal.—R  
Hertner Electric Co., 12690 Elmwood Ave., Cleveland 11, Ohio—A,B,G,H,J,K,L,M,N,O  
Holtzer-Cabot Div.—National Pneumatic Co., 125 Army St., Boston 19, Mass.—B,E,N,O  
Howard Industries, Inc., Electric Motor Corp. Div., Racine, Wisc.—E,G,H,I,J,K,L,M,N,O,Q,R  
Induction Motors Corp., 55-15 37 Ave., Woodside 77, N.Y.—A,G,J,L,K,N,O,P,Q  
Inet, Inc., 866 S. Main St., Los Angeles 3, Calif.—R  
Instrument Corp. of America, Blackburg, Va.  
Instrument Motors, 18 Liberty St., Stamford, Conn.—A,H,K,L,N,O  
Jack Scientific Instrument Co., Jack, Solana Beach, Calif.—O  
Kearfott Co., 1150 McBride Ave., Little Falls, N.J.—L,N,O  
KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—I  
KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—L,M,N,O  
Kinetix Inst. Co., 902 Broadway, New York 10, N.Y.—K,L,O  
KOLLSMAN INSTRUMENT CORP., 80-08 45 Ave., Elmhurst 73, N.Y.—K,N  
Kupfrian Mfg. Co., 367 State St., Binghamton, N.Y.—C  
Leland Electric Co.—Div. American Machine & Foundry, 1501 Webster St., Dayton 1, Ohio—A,B,G,H,I,J,K,M  
Lima Electric Motor Co., Lima, Ohio—K  
Link-Relt Co., 307 N. Michigan Ave., Chicago 1, Ill.—C,D  
Mag-Electric Products Inc., 14405 Crenshaw Ave., Gardiner, Calif.—R  
Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—P  
Master Appliances Mfg. Co., Fourth & Ontario Sts., Racine, Wis.—E,K,M,N  
Midco Mfg. & Distr. Co., 13th & Kentucky, Sheboygan, Wis.—F,G,H,R  
Minn.-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.—O,P  
Mission-Western Engineers, Inc., 132 W. Colorado St., Pasadena, Calif.—A,E,K,L,M,N,O,R,S  
Motor Generator Corp., Hobart Sq. Troy, Ohio—B,H,J  
Motoresearch Co., 1600 Junction Ave., Racine, Wisc.—A,R,G,H,J,N  
Mueller Eng'g. Co.: Heinz A., 801 N. Linden Ave., Oak Park, Ill.—K,L,M,N,O,P  
Natvar Corp., 201 Randolph Ave., Woodbridge, N.J.—O  
Onan & Sons, Inc., D.W. University Ave., S. E. at 25, Minneapolis 14, Minn.—F,G,H,R  
Oster Mfg. Co., John. 1 Main St., Racine, Wisc.—G,H,K,L,M,O  
Packard-Bell Co., 12333 W. Olympic Blvd., W. Los Angeles, Calif.—I  
Park Armature Co., 383 Boylston St., Boston 16, Mass.—A,B,E,G,H,K,L,M,N,O  
Par Products Corp., 926 N. Citrus Ave., Hollywood 38, Calif.—K  
Peerless Electric Co., 1401 W. Market St., Warren, Ohio—K,M  
Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—H,M,N,O  
Pioneer Gen-E-Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.—E,G,H,I,R  
Portable Electric Tools, Inc., 200 W. 83rd St., Chicago 20, Ill.—A,R,E,G,H,J,K,M,N,O  
Pratt, Albert, 1939 N. 18 St., Milwaukee 5, Wisc.—E  
Redmond Co., Owosso, Mich.—A,E,I,K,M,N  
Safe Flight Instrument Corp., 4 Water St., White Plains, N.Y.—B,E  
Sanders Assoc., 137 Canal, Nashua, N.H.—O  
Saratoga Industries, Ballston Ave., Saratoga Springs, N.Y.—I  
Schwien Eng'g. Co., 16217 Lindbergh St., Van Nuys, Calif.—K,M,N,O  
Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y.—K,L,N,O,P

Servo-Tek Products Co., 1036 Goffe Rd., Hawthorne, N.J.—H,L,M,N,O  
Sessions Clock Co., Forestville, Conn.—N,P  
Small Motors Inc., 2076 Elston Ave., Chicago 14, Ill.—B,E,K,L,M,N,S  
Specialty Battery Co., 212 E. Washington Ave., Madison 10, Wisc.—N  
Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—L,K,O  
Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—K,L,N,O  
Star-Kimble Motor, 200 Bloomfield Ave., Bloomfield, N.J.—A,B,G,H,K,M  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,E,G,H,I,K,M,O  
Telechron Dept., General Electric Co., 43 Homer Ave., Ashland, Mass.—P  
Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.  
Telex, Inc., 1633 Eustis St. Paul, Minn.—O  
Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—K,M,N,P,Q  
TRANSICOIL CORP., 107 Grand St., New York 13, N.Y.—K,N,O,P,R  
United Pressed Products Co., 741 W. Harrison St., Chicago 7, Ill.—K,Q,N  
U.S. Electrical Motors, 200 E. Sauson Ave., Los Angeles 54, Calif.—K,L  
Vocaline Co. of America, Coulter St., Saybrook, Conn.—K,L,N,P,Q  
Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—E,K,M,N  
WINCHARGER CORP., E 7 at Division St., Sioux City 2, Iowa—B,E,G,H,K,M,N,O,R

## 63—NAVIGATION SYSTEMS

Loran	A
Omnirange	B
Radar	C
Radist	D
Shoran	E
Sofar	F
Sonar	G

Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—C  
Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—E  
Aeronautical Radio Mfg. Co., 155 1 St., Mineola, N.Y.—A  
Aircraft Armaments Inc., 4415 Reestertown Rd., Baltimore 15, Md.—A,B,C,D,E,F  
AIRCRAFT RADIO CORP., P. O. Box 150, Boonton, N.J.—B  
American Electroneering Corp., 2040 Colorado Ave., Santa Monica, Calif.—B  
American Machine & Fdry. Co., 1085 Commonwealth Ave., Boston, Mass.—C,G  
Applied Science Corp., P. O. Box 44, Princeton, N.J.—C  
Atlas Metal Stamping Co., Castor & Kensington Aves., Philadelphia 24, Pa.—C  
Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—A,C  
Austin Co., 76 9 Ave., New York 11, N.Y.—C,G  
Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—A,B,C,D,E,F,G  
BENDIX RADIO DIV., BENDIX AVIATION CORP., E. Joppa Rd., Towson 4, Md.—B,C,E  
Benson-Lehner Corp., 2340 Sawtelle Blvd., Los Angeles 64, Calif.—F  
BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—C  
Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—C  
Communication Devices Co., 2331 12 Ave., New York 27, N.Y.—A,G  
Conn. Marine Instr. Co., Essex, Conn.—C  
Dayton Aviation Radio & Equip. Corp., Dayton Municipal Airport, Vandalia, Ohio—B  
DUMONT LABS. INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—C  
DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—C  
Edo Corp., 1310 111 St., College Point, N.Y.—G  
Electrotech Corp., 15601 Arrow Hwy., Azusa, Calif.—G  
Elk Electronic Labs. Inc., 333 W. 52 St., New York 19, N.Y.—A  
Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—C  
Erco Radio Labs., Stewart Ave., Garden City, N.Y.—B  
Esney Mfg. Co., 528 E. 72 St., New York 23, N.Y.—A,C,E  
FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—A,B,C  
Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—A,C,E,G  
General Electronics Inc., 32 W. 22 St., New York 10, N.Y.—A,G  
GENERAL PRECISION LAB. INC., 63 Bedford Rd., Pleasantville, N.Y.—C  
G & M Equip. Co., 7315 Varna Ave., N. Hollywood, Calif.—C  
Grem Eng'g. Co., 492 3 St., Brooklyn 15, N.Y.—C,F,G  
Hastings Instrument Co., Superhighway at Pine Ave., Hampton, Va.—D  
Kane Electronics Corp., 81 Willoughby St., Brooklyn 1, N.Y.—C  
Kinetex Instrument Co., 902 Broadway, New York 10, N.Y.—A,B,C,D,E,F,G

# ELECTRONIC INDUSTRIES DIRECTORY

**KOLLSMAN INSTRUMENT**, Elmhurst, N.Y.—A,B  
**Korb Eng'g. & Mfg. Co.**, 30 Ottawa Ave., Grandville, Mich.—C  
**Lavoie Labs. Inc.**, Morganville, N.J.—B,C  
**Lear, Inc.**, 11916 W. Pico Blvd., Los Angeles 64, Calif.—B  
**Mackay Radio & Telegraph Co.**, 345 Hudson St., New York 14, N.Y.—C  
**Marconi's Wireless Telegraph Co.**, 23 Beaver St., New York 4, N.Y.—B,C  
**MAGNAVOX CO.**, Ft. Wayne 4, Ind.—C  
**Maxson Corp.**, W. L., 460 W. 34 St., New York 1, N.Y.—C,E  
**MELPAR, INC.**, 452 Swann Ave., Alexandria, Va.—C  
**Mitchell Industries**, Box 17, Mineral Wells, Tex.—B  
**National Aeronautical Corp.**, 180 S. Main St., Ambler, Pa.—B  
**National Instrument Co.**, 23 E. 26 St., New York 10, N.Y.  
**Norden Instruments & Systems**, Milford, Conn.  
**N.R.K. MFG. & ENG'G. CO.**, 4601 W. Addison St., Chicago 41, Ill.—C  
**Packard-Bell Co.**, 12333 W. Olympic Blvd., W. Los Angeles, Calif.—C,G  
**PHILCO CORP., GOV'T. & INDUSTRIAL DIV.**, 4700 Wissahickon Ave., Philadelphia 44, Pa.—A  
**Press Wireless Mfg. Co.**, 155 W. Main St., Rockville, Conn.—C,G  
**Radar-Electronics Inc.**, 229 W. 28 St., New York 1, N.Y.—C  
**RADIO RECEPTOR CO.**, 84 N. 9 St., Brooklyn, N.Y.—B,C  
**RAYTHEON MFG. CO.**, Waltham 54, Mass.—C,G  
**Raytheon TV & Radio Corp.**, 5921 W. Dickens Ave., Chicago 39, Ill.—C  
**Remler Co.**, 2101 Bryant St., San Francisco 10, Calif.—C  
**Resdel Eng'g.**, 2351 Riverside Dr., Los Angeles 39, Calif.—A,B,C,G  
**Ryan Industries**, 19159 John R St., Detroit 3, Mich.—C  
**Seismograph Service Corp.**, P. O. Box 1590, Tulsa, Okla.—A  
**Sonar Radio Corp.**, 3050 W. 21 St., Brooklyn 24, N.Y.—G  
**Tallen Co.**, 159 Carlton Ave., Brooklyn 5, N.Y.—C,G  
**Telemarine Communications Co.**, 3040 W. 21 St., Brooklyn 24, N.Y.—A,G  
**Tel-screen Corp.**, 36 Grove St., New Canaan, Conn.—C  
**Torngren Co.**, C. W., 236 Pearl St., Somerville, Mass.—C  
**Transmitter Equip. Mfg. Co.**, 345 Hudson St., New York 14, N.Y.—C  
**Ultrasonic Corp.**, 61 Rogers St., Cambridge 42, Mass.—C,G  
**Univex Corp.**, 102 Warren St., New York 7, N.Y.—B  
**VECTRON, INC.**, 400 Main St., Waltham 54, Mass.—C,E  
**Videon Electronic Corp.**, 222 E. Ohio St., Indianapolis 4, Ind.—C  
**White & Sons, Inc.**, O., 178 Atlantic Ave., Boston 10, Mass.—G  
**Willys-Overland Motors**, 6225 Benore Rd., Toledo, Ohio—C  
**Wilcox Electric Co.**, 1400 Chestnut St., Kansas City 1, Mo.—G

## 64—PHOTOELECTRIC EQUIPMENT

**Cells, photoelectric** .....A  
**Cells, photovoltaic** .....B  
**Colorimeters** .....C  
**Light supplies** .....E  
**Mirrors** .....F  
**Photoelectric units, complete** .....D  
**Photometers** .....G  
**Relays** .....H

**Aerolux Light Corp.**, 653 11 Ave., New York 36, N.Y.—E  
**American Optical Co.**, Instrument Div., Box A, Buffalo 15, N.Y.—A  
**Allied Research & Eng'g. Inc.**, 1041 N. Las Palmas Ave., Hollywood 38, Calif.—F  
**American Chronoscope Corp.**, 316 W. 1 St., Mt. Vernon, N.Y.—D  
**American Instrument Co.**, Silver Springs, Md.—H  
**ANDREW CORP.**, 363 E. 75 St., Chicago 19, Ill.—D  
**Appied Physics Corp.**, 362 W. Colo. St., Pasadena 1, Calif.—G  
**Automatic Electronic Eng'g. Co.**, 2207 E. North Ave., Milwaukee 2, Wisc.—D  
**Avia Products Co.**, 7266 Beverly Rd., Los Angeles 36, Calif.—E  
**Baird Associates Inc.**, 33 University Rd., Cambridge, Mass.—G  
**Barton Electronics, Inc.**, 955 Asylum Ave., Hartford 5, Conn.—D,E,H  
**Bausch & Lomb Optical Co.**, 628 St. Paul St., Rochester, N.Y.—C,F  
**Beckman Instruments Inc.**, 820 Mission St., S. Pasadena 1, Calif.—C  
**BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS INC.**, 2200 Wright Ave., Richmond 3, Calif.—A,D,E

**Bowen & Co.**, 4712 Bethesda Ave., Bethesda, Md.—D,F  
**Buhl Optical Co.**, 1009 Beech Ave., Pittsburgh 12, Pa.—F  
**Central Scientific Co.**, 1700 Irving Park Rd., Chicago 13, Ill.—C  
**Coleman Instruments Inc.**, 318 Madison St., Maywood, Ill.—G  
**Costelow Co., J. A.**, 125 Kansas Ave., Topeka, Kan.—A,H  
**Delaware Optical Labs.**, 36 Williams St., Lansdowne, Pa.—B,C,E,F,G  
**Digital Instrument Co.**, 212 Almeria Ave., Coral Gables, Fla.—D,E,H  
**Electric Eye Equip. Co.**, 6 W. Fairchild St., Danville, Ill.—C  
**Electrodyn, Endicott St.**, Norwood, Mass.—D  
**Electro-Physics Co.**, 287 Broadway, New York 7, N.Y.—G,H  
**Electro-Tech Equip. Co.**, 308 Canal St., New York, N.Y.—A,B,D,H  
**Electron-Radar Products**, 1041 N. Pulaski Rd., Chicago 51, Ill.—A,B  
**Electro Vision Lab.**, 30-16 Crescent St., Long Island City 2, N.Y.—A,D,E,H  
**Electronic Control Corp.**, 1573 E. Forest Ave., Detroit 7, Mich.—D,E,H  
**Eng'g. Research & Devel. Co.**, Addison, Ill.—D,E,H  
**Equipment & Service Co.**, 6815 Oriole Dr., Dallas 9, Tex.—A  
**FAIRCHILD CAMERA & INSTRUMENT CORP.**, Robbins Lane, Syosset, N.Y.—A,B,C,D,E,F,G,H  
**FREED ELECTRONICS & CONTROLS CORP.**, 200 Hudson St., New York 13, N.Y.—C,D,G  
**Gardner Lab. Inc.**, H. A., 4723 Elm St., Bethesda 14, Md.—C,D  
**GENERAL ELECTRIC CO.**, Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—A,B,C,E,G  
**Glens Falls Lab. Inc.**, 284 Glen St., Glens Falls, N.Y.  
**Gurley, W. & L. E.**, 514 Fulton St., Troy, N.Y.—F  
**Haledy Electronics Co.**, 57 William St., New York 5, N.Y.—D,E,H  
**Hansen Co., Wm.**, 165 Silverbrook Ave., Niles, Mich.—D,H  
**Harwood Mfg. Co.**, 466 W. Superior St., Chicago 10, Ill.—E  
**Hercules' Elec. Mach'y. & Equip. Co.**, 1442 E. Washington Blvd., Los Angeles 21, Calif.—H  
**Hudson Lamp Co.**, 528 Elm St., Arlington, N.J.—E  
**Industrial Electronics Co.**, Hanover St., Hanover, Mass.—H  
**Instrument Devel. Labs.**, 163 Highland Ave., Needham 94, Mass.—C,D  
**IQ Industries**, 6110 Wilshire Blvd., Los Angeles 36, Calif.—A,C,D,E,H  
**International Rectifier Corp.**, 1521 E. Grand Ave., El Segundo, Calif.—A  
**Leitz, E.**, 468 4 Ave., New York 16, N.Y.—C  
**Logistic Research, Inc.**, 141 S. Pacific Ave., Redondo Beach, Calif.—D  
**Lumenite Electronic Co.**, 407 S. Dearborn St., Chicago 5, Ill.—D,H  
**Lyseo Mfg. Co.**, 1401 Clinton St., Hoboken, N.J.—D  
**Magnex Corp.**, 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—C,D,E  
**Manufacturers Eng'g. & Equip. York & Mill Rds.**, Hatboro, Pa.—C  
**McNeill Eng'g. Co.**, 4057 W. Van Buren St., Chicago 24, Ill.—D  
**Multi-Tron Lab.**, 4624 Washington Blvd., Chicago 44, Ill.—D,E,H  
**Neomatic, Inc.**, 9010 Bellanca Ave., Los Angeles 45, Calif.—H  
**Pacific Universal Products Corp.**, 168 Vista Ave., Pasadena 8, Calif.—F  
**Pancro Mirrors Inc.**, 2958 Los Feliz Blvd., Los Angeles 39, Calif.—F  
**Patwin Instruments, Div. of Patent Button Co.**, 41 Brown St., Waterbury 20, Conn.—G  
**PHAOSTRON CO.**, 151 Pasadena Ave., S. Pasadena, Calif.—H  
**Phoenix Precision Instrument Co.**, 3803 N. 5 St., Philadelphia 40, Pa.—A,B,C,D,E,F,G,H  
**Photobell Co.**, 116 Nassau St., New York 38, N.Y.—A,B,D,E,F,H  
**Photocon Research Products**, 421 N. Foothill Blvd., Pasadena 8, Calif.—G  
**Photoswitch Inc.**, 77 Broadway, Cambridge 42, Mass.—A,D,H  
**Photovolt Corp.**, 95 Madison Ave., New York 16, N.Y.—C  
**Potter Instrument Co.**, 115 Cutter Mill Rd., Great Neck, L.I., N.Y.  
**Precise Measurements Co.**, 942 Kings Highway, Brooklyn 23, N.Y.—D,E  
**Precision Electronics Inc.**, 9101 King Ave., Franklin Park, Ill.—A  
**Process & Instruments**, 60 Greenpoint Ave., Brooklyn 22, N.Y.—C  
**Remco Mfg. Co.**, 545 N. La Salle St., Chicago 10, Ill.—H  
**Ripley Co.**, 1 Factory St., Middletown, Conn.—E,F,G,H

**Semon Bache & Co.**, 636 Greenwich St., New York 14, N.Y.—F  
**S.O.S. Cinema Supply Corp.**, 602 W. 52 St., New York 19, N.Y.—A  
**Special Instruments Lab.**, 1003 Highland Ave., Knoxville, Tenn.—C  
**Special Products Co.**, 9115 Brookville Rd., Silver Spring, Md.—D  
**Tabet Mfg. Co.**, 254 W. Tazewell St., Norfolk 10, Va.—H  
**TELECHROME, INC.**, 88 Merrick Rd., Amityville, L.I., N.Y.—C  
**Thompson Clock Co., H. C.**, 38 Federal St., Bristol, Conn.—A,B,D,E,F,G,H  
**Univex Corp.**, 102 Warren St., New York 7, N.Y.—D  
**Ultrasonic Eng'g. Co.**, P. O. Box 46, Maywood, Ill.—G  
**Vickers Electric Div., Vickers, Inc.**, 1835 Locust St., St. Louis 3, Mo.—B  
**Welch Mfg. Co., W. M.**, 1515 Sedgwick St., Chicago 10, Ill.—C,G  
**Western Electronic Enterprises**, 3348 W. Compton Blvd., Gardena, Calif.—A  
**Weston Electrical Instrument Corp.**, 614 Frelinghuysen Ave., Newark 5, N.J.—A,H  
**Worner Electronic Devices**, Rankin, Ill.—D

## 65—PLASTIC MATERIALS

**Acrylics** .....A  
**Cellulose, acetate** .....C  
**Cellulose, acetate butyrate** .....D  
**Cellulose, ethyl** .....E  
**Cellulose, nitrate** .....F  
**Laminates** .....G  
**Melamines** .....H  
**Methyls** .....I  
**Phenolics** .....J  
**Polyethylene** .....K  
**Polystyrene** .....L  
**Polytetrafluoroethylene** .....M  
**Polytrifluoroethylene** .....N  
**Resin, aniline-formaldehyde** .....O  
**Resin, cast** .....P  
**Resin, vinyl** .....Q  
**Urea** .....S

**Acheson Colloids Co., Div. Acheson Industries, Inc.**, 1950 Washington Ave., Port Huron, Mich.—L  
**Air Associates Inc.**, 1231 Airway, Glendale 1, Calif.—A,C,D,F  
**Airflyte Electronics Co.**, 21 Cottage St., Bayonne, N.J.—P  
**Allied Engraving & Stamping Co.**, 161 Ellicott St., Buffalo 3, N.Y.—G  
**AMERICAN PHENOLIC CORP.**, 1830 S. 54 Ave., Chicago 50, Ill.—A,C,D,H,J,K,L,M,N,O,Q  
**American Products Mfg. Co.**, 8127 Oleander St., New Orleans 18, La.—C,E,F  
**Baer Co., N. S.**, 1 Montgomery St., Hillside 5, N.J.—C,G,H,J  
**Bakelite Co., Div. Union Carbide & Carbon Corp.**, 30 E. 42 St., New York 17, N.Y.—J,K,L,N,O,S  
**Blacher, B.**, 752 Bway., New York 3, N.Y.  
**Bram Chemical Co.**, 820 65 Ave., Philadelphia 26, Pa.—A,G,Q  
**Brilhart Plastic Corp.**, Box 31, Old Country Rd., Mineola, L.I., N.Y.  
**Calresin Corp.**, 333 N. Santa Anita, Arcadia, Calif.—G  
**Cast Optics Corp.**, 1010 Post Rd., Riverside, Conn.—A,P,L  
**Celanese Corp. of America**, 180 Madison Ave., New York 16, N.Y.—C  
**Ciba Co.**, 627 Greenwich St., New York 14, N.Y.—J,O,P  
**CLEVELAND CONTAINER CO.**, 6201 Barber-ton Ave., Cleveland 2, Ohio—G,J  
**Conn. Hard Rubber Co.**, 407 East St., New Haven 9, Conn.—M,N  
**Continental-Diamond Fibre Co.**, Newark, Del.—G,H,J  
**Continental Textile & Supply Co.**, 4245 W. Armitage Ave., Chicago 39, Ill.—Q  
**Dielectric Materials Co.**, 5315 N. Ravenswood Ave., Chicago 40, Ill.—K,Q  
**DuPont De Nemours & Co., E. I.**, 10 & Market Sts., Wilmington 98, Del.—A,C,F,K,M,Q  
**Durez Plastics & Chemicals, Inc.**, 1926 Walck Rd., N. Tonawanda, N.Y.—J  
**Dynakon Corp.**, 9623 Clinton, Cleveland, Ohio—G,P  
**Eastman Chemical Products, Inc.**, Kingsport, Tenn.—C,D  
**Electronic Mechanics, Inc.**, 101 Clifton Blvd., Clifton, N.J.—M,N  
**Electro-Technical Products Div., Sun Chemical Corp.**, 113 E. Centre St., Nutley 10, N.J.—G,H,K,N  
**Emeloid Co.**, 1239 Central Ave., Hillside, N.J.—C,D,F,G,K,L,Q  
**Emerson & Cuming**, 869 Washington St., Canton, Mass.—G,K,L,M,P  
**Extruders, Inc.**, 3232 W. El Segundo Blvd., Hawthorne, Calif.—K  
**Forman Co., Inc.**, B. G., 238 William St., New York 38, N.Y.—P  
**FORMICA CO.**, 4644 Spring Grove Ave., Cincinnati 32, Ohio—G

GENERAL ELECTRIC CO., CHEMICAL DIV., 1 Plastics Ave., Pittsfield, Mass.—G,J  
Gering Products, Inc., N. 7 St. & Monroe Ave., Kenilworth, N.J.—C,D,E,K,L,Q  
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.—A,C,D,E,K,L  
Good, Inc., Don, 1014 Fair Oaks Ave., S. Pasadena, Calif.—K  
Goodrich Chemical Co., B.F., 2060 E. 9 St., Cleveland 15, Ohio—A,Q  
Hermes Plastics, Inc., 13 University Pl., New York 3, N.Y.—J,G  
Hopp Press, Inc., 460 W. 34th St., New York 1, N.Y.  
Imperial Radar & Wire Corp., 4342 Bronx Blvd., New York 66, N.Y.—K,L  
Insulating Fabricators of New England, 69 Grove St., Watertown 72, Mass.—A,G,H,K,L,M,N  
Insulating Tube Co., 26 Cottage St., Poughkeepsie, N.Y.—J,G  
Insulation Mfrs. Corp., 565 W. Washington Blvd., Chicago 6, Ill.—C,E,G,K  
Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N.J.—K  
Javex, Box 646, Redlands, Calif.  
Keller Products, 41 Union St., Manchester, N.H.—G  
Kellogg Co., M. W. Ft. of Danforth Ave., Jersey City, N.J.—N  
Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—J  
Long, Inc., Thomas J., 215 Stonehinge Lane, Carle Place, Long Island, N.Y.—G,J  
Lunn Laminates, Inc., Huntington Station, N.Y.—G  
MELPAR, INC., 452 Swann Ave., Alexandria, Va.—P  
Merix Chemical Co., 1021 E. 55 St., Chicago 15, Ill.  
Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—G  
Miller Electric Co., P. O. Box 1827, Jacksonville, Fla.—A,C,D,E,F,H,J,K,L,M,N,Q  
Minerals & Insulation Co., 55 Central Ave., Rochelle Park, N.J.—O,J  
Minn. Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.—P  
Minn. Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis 16, Minn.—R  
Mitchell Rand Companies, 51 Murray St., New York 7, N.Y.—P  
Molding Specialists, 52 Islin St., Yonkers 2, N.Y.—P  
Moore Co., Howard J., 226 William St., New York, N.Y.—C,E,F,G,H,J,K,L,M,N  
National Gasket & Washer Mfg. Co., 124 E. 25 St., New York 10, N.Y.—B,C,J  
National Plastic Products, Odenton, Md.—G  
National Vulcanized Fibre Co., Maryland Ave. & Beech St., Wilmington 99, Del.—B,G,H,J  
Natvar Corp., 211 Randolph Ave., Woodbridge, N.J.—L,Q  
Peerless Products Industries, 812 N. Pulaski Rd., Chicago 51, Ill.  
Penn Fibre & Specialty Co., 2030 E. Westmoreland St., Philadelphia 34, Pa.—G,J  
Plaskon Div., Libbey-Owens-Ford Glass Co., 2112 Sylvan Ave., Toledo 6, Ohio—H,S  
Plasticraft Products Co., 1 Station Plaza, West Nyack, N.Y.—A,C,G,H,J,K,L  
Plastilight, Inc., 481 Canal St., Stamford, Conn.—G  
Polymer Corp. of Pa., 126 N. 5th St., Reading, Pa.—M,N,P  
PRECISION PAPER TUBE CO., 2035 W. Charleston St., Chicago 47, Ill.  
Precision Plastic Products, 225 N. Racine Ave., Chicago 7, Ill.—A,L  
Ramsell Mfg. Co., 420 Market St., San Francisco, Calif.—Q  
Red Seal Electric Co., 6321 Detroit Ave., Cleveland 2, Ohio—J  
Reilly Tar & Chemical Corp., 1615 Merchant Bank Bldg., Indianapolis, Ind.—J  
Resistoflex Corp., 39 Plansoen St., Belleville 9, N.J.—K,M,N  
Rex Corp., Hayward Rd., West Acton, Mass.—L,M,N,P,Q  
Richardson Co., Lockland, Cincinnati 15, Ohio—A,C,E,G,H,J,K,L  
Ridgized Metals Corp., 658 Ohio St., Buffalo 3, N.Y.—Q  
Rogers Corp., Goodyear, Conn.—G,J  
Ryerson & Son, Inc., Joseph T., Box 8000-A, Chicago 80, Ill.—J  
St. Regis Paper Co., Panelyte Div., 230 Park Ave., New York, N.Y.—G,H,J,L  
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—P  
Spaulding Fibre Co., 310 Wheeler St., Tonawanda, N.Y.—G,J  
Stratosseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.—M  
Surprenant Mfg. Co., 199 Washington St., Boston 8, Mass.—K,Q  
SYNTHANE CORP., Oaks, Pa.—G,H,J  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—H  
Tavlor Fibre Co., Norristown, Pa.—G,H,J  
Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—A,P,Q  
Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,J,L  
U.S. Gasket Co., 602 N. 10 St., Camden 1, N.J. M,N  
Valentino, Inc., T.J., 150 W. 46 St., New York 36, N.Y.—Q  
Varflex Corp., 305 N. Jay St., Rome, N.Y.—K

Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—G,Q,S  
Wilmington Fibre Specialty Co., P.O. Drawer 1028, Wilmington 99, Del.—J  
Willson Camera Co., 1401 Lawrence Rd., Havertown, Pa.—A,C,D,G,H,J,Q  
Wood Co. Ash M., 11938 E. Garvey Blvd., El Monte, Calif.

## 66—PLASTIC MOLDERS & FABRICATORS

**Fabricators . . . . . A**  
**Molders, cabinet . . . . . B**  
**Molders, extruded shapes . . . . . D**  
**Molders, parts . . . . . C**

Acme Scientific Co., 1450 W. Randolph St., Chicago 7, Ill.—C  
Allied Engraving & Stamping Co., 161 Elliott St., Buffalo 3, N.Y.—A,C  
AMERICAN PHENOLIC CORP., 1830 S. 54 Av Chicago 50, Ill.—C  
American Radio Hardware Co., 152 Macquisten Parkway S., Mount Vernon, N.Y.—D  
ANCHOR PLASTICS CO., 36-36 36 St., Long Island City, N.Y.—D  
Auburn Button Works, Auburn, N.Y.—C,D  
Auburn Mfg. Co., Pease Ave. & Stack St., Middletown, Conn.—A  
Baer Co., N. S., 1 Montgomery St., Hillside 5, N.J.—A  
Blazon Mfg., 6021 Dempster St., Morton Grove, Ill.—C  
BRAND & CO., WM., North & Valley Sts., Wilimantic, Conn.—D  
Brilhart Plastic Corp., Box 31, Old Country Rd., Mineola, L.I., N.Y.—A,B,C  
Cincinnati Molding Co., 2037 Florence Ave., Cincinnati 6, Ohio—C  
Citation Products Co., 233 E. 146 St., New York 51, N.Y.—A  
Commercial Plastics Co., 2812 W. North Ave., Chicago 47, Ill.—A,D  
Conn. Hard Rubber Co., 407 East St., New Haven 9, Conn.—C,D  
Consolidated Molded Products Corp., 309 Cherry St., Scranton 2, Pa.—A,B,C  
Continental Connector Corp., 30-30 Northern Blvd., Long Island City 1, N.Y.—C  
Continental-Diamond Fibre Co., Newark, Del.—A,C  
Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio—C  
EBY INC., HUGH H., 4700 Stenton Ave., Philadelphia 44, Pa.—A,C  
Elco Corp., 190 W. Glenwood Ave., Philadelphia 40, Pa.—C  
Electro Development Co., 6006 W. Washington Blvd., Culver City, Calif.—C  
Electronic Assemblies Co., 122 W. 5 St., Kansas City 5, Mo.—A,C  
ELECTRONIC MECHANICS, INC., 101 Clifton Blvd., Clifton, N.J.—A,C  
Emeloid Co., 1239 Central Ave., Hillside, N.J.—A,B,D  
Frie Resistor Corp., Erie, Pa.—C  
Extruders Inc., 3232 W. El Segundo Blvd., Hawthorne, Calif.—D  
FORMICA CO., 4644 Spring Grove Ave., Cincinnati 32, Ohio—A  
GARDE MFG. CO., 588 Eddy St., Providence 3, R.I.—C  
GENERAL ELECTRIC CO., CHEMICAL DIV., 1 Plastics Ave., Pittsfield, Mass.—B,C  
General Products Corp., Union Springs, N.Y.—C  
Gering Products, Inc., N. 7 St. & Monroe Ave., Kenilworth, N.J.—D  
Gits Molding Corp., 4600 W. Huron St., Chicago 44, Ill.—C  
Grayhill, 561 Hillgrove Ave., La Grange, Ill.—C  
Gries Reproducer Corp., 780 E. 133 St., New York 54, N.Y.—C  
Haydon Products Corp., 1801 8 Ave., Brooklyn 15, N.Y.—C  
Hopp Press, Inc., 460 W. 34 St., New York 1, N.Y.—A,C  
Hydro Molding Co., 100 Sharron Ave., Plattsburg, N.Y.—C  
Industrial Devices, Edgewater, N.J.—C  
Insulating Fabricators of New England, 69 Grove St., Watertown 72, Mass.—A  
Insulation Mfrs. Corp., 565 W. Washington Blvd., Chicago 6, Ill.—A  
Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N.J.—D  
Kaywoff Products Co., Overton, Nebr.—D  
Kennedy & Co., D. S., 432 S. Main St., Cohasset, Mass.—A,B,C  
Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—A  
Kirchherger & Co., M., 1425 37 St., Brooklyn 18, N.Y.—A  
Klise Mfg. Co., 50 Cottage Grove St., S.W. Grand Rapids 2, Mich.—A  
Kurz-Kasch, Inc., 1420 S. Broadway, Dayton 1, Ohio—B,C  
Lee Electronic Labs., Inc., 233 Dudley St., Boston 19, Mass.—A  
Long Inc., Thomas J., 215 Stonehinge Lane, Carle Place, L.I., N.Y.—A  
Lynn Electronic Research Co., 9 W. Magnolia, Burbank, Calif.—A  
MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—A,B,C,D

Mandex Mfg. Co., 2608 W. 16 St., Chicago 8, Ill.—A,C  
Mansol Ceramics, 13 Valley St., Belleville, N.J.—A,D  
Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—A  
Merix Chemical Co., 1021 E. 55 St., Chicago 15, Ill.  
Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—A,C  
Midwest Plastic Products, 1801 Chicago Rd., Chicago Heights, Ill.—D  
Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—C  
Minn. Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis 16, Minn.—C  
Molded Insulation Co., 335 E. Price St., Philadelphia 44, Pa.—C  
Molding Corp. of America, 40 Church St., Pawtucket, R.I.—C  
Molding Specialists, 52 Islin St., Yonkers 2, N.Y.—C  
Moore Co., Howard J., 226 William St., New York, N.Y.—A  
MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—A,C  
Naer Corp., 11777 Santa Monica Blvd., W. Los Angeles 25, Calif.—A,C  
National Gasket & Washer Mfg. Co., 124 E. 25 St., New York 10, N.Y.—A  
National Vulcanized Fibre Co., Maryland Ave. & Beech St., Wilmington 99, Del.—A  
Natvar Corp., 211 Randolph Ave., Woodbridge, N.J.—D  
Neo-Sil Corp., 26 Cornelson Ave., Jersey City, N.J.—C  
New Products Co., 1071 E. 54 St., Indianapolis, Ind.—A,C  
Nichols Products Co., 325 W. Main St., Moorestown, N.J.—A  
Northern Industrial Chemical Co., 7 Elkins St., South Boston 27, Mass.—C  
Norton Labs., Inc., 520 Mill St., Lockport, N.Y.—C  
Owens-Illinois Glass Co., Madison & St. Clair Sts., Toledo 1, Ohio—C  
Parisian Novelty Co., 3510 S. Western Ave., Chicago 9, Ill.—A  
Penn Fibre & Specialty Co., 2030 E. Westmoreland St., Philadelphia 34, Pa.—A  
Plastic Accessories Inc., 91 Mercer St., New York 12, N.Y.—A  
Plasticite Corp., 327 Rider Ave., New York 51, N.Y.—A,C  
Plasticraft Products Co., 1 Station Plaza, West Nyack, N.Y.—A  
PM Industries, Inc., 280 Fairfield Ave., Stamford, Conn.—C  
Polymer Corp. of Penna., 126 N. 5 St., Reading, Pa.—A,C,D  
Precision Associates, 354 Cumberland St., Brooklyn 17, N.Y.—A  
Precision Plastic Products, 225 N. Racine Ave., Chicago 7, Ill.—A  
PRINTLOID, INC., 93 Mercer St., New York 12, N.Y.—A  
Quality Components, Inc., St. Marys, Pa.—C  
Ralston Record Co., 110 Cedar Ave., Pitman 15, N.J.—A  
Red Seal Electric Co., 6321 Detroit Ave., Cleveland 2, Ohio—A  
Remler Co., 2101 Bryant St., San Francisco 10, Calif.—B,C  
Research Instrument Co., 233 Broadway, New York 7, N.Y.—A,B,C  
Resistoflex Corp., 39 Plansoen St., Belleville 9, N.J.—A,C,D  
Richardson Co., Lockland, Cincinnati 15, Ohio—A,B,C,D  
Rogan Brothers, 8031 N. Monticello Ave., Skokie, Ill.—C  
Ryerson & Son, Inc., Joseph T., Box 8000-A, Chicago 80, Ill.—C  
St. Regis Paper Co., Panelyte Div., 230 Park Ave., New York, N.Y.—A,C  
Shaw Insulator Co., 160 Coit St., Irvington 11, N.J.—C  
Sillcocks-Miller Co., 10 W. Parker Ave., Maplewood, N.J.—A  
Slate & Associates, C. C., 11370 W. Olympic Blvd., Los Angeles 64, Calif.—B,C  
Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—C  
Stevens Products, 86 Main St., E. Orange, N.J.—C,D  
SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—C  
SYNTHANE CORP., 11 River Rd., Oaks, Pa.—A  
Tavlor Fibre Co., Norristown, Pa.—A  
Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—B,C  
Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A,B,D  
Tri-State Plastics, Inc., 5509 Lincoln Ave., Chicago 25, Ill.—A,C  
U. S. Gasket Co., Fluorocarbon Products Div., Camden 1, N.J.—A,C,D  
Universal Specialty Co., P. O. Box 1892, Boston 5, Mass.—C  
Vari-Equip Co., 35 Grove St., White Plains, N.Y.—A  
Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—A,C  
Whitso, Inc., 9330 Byron St., Schiller Park, Ill.—C  
Wilmington Fibre Specialty Co., P. O. Drawer 1028, Wilmington 99, Del.—A  
Willson Camera Co., 1401 Lawrence Rd., Havertown, Pa.—A  
Woodall Industries, Inc., 7569 E. McNichols Rd., Detroit 34, Mich.—A

**67—PRODUCTION  
MACHINERY &  
EQUIPMENT**

- Blueprint machines .....A
- Buffers & Grinders .....B
- Coil Winding machines .....C
- Counting machines .....D
- Crystal embedding equipment .....E
- Crystal etching equipment .....F
- Crystal grinders .....G
- Crystal ovens .....H
- Crystal polishing equipment .....I
- Crystal production equipment .....J
- Demagnetizers .....K
- Drill presses .....L
- Engraving machines .....M
- Vibration control equipment .....N
- Furnaces, electric .....O
- Glass blowing & working machines .....P
- Impregnating machines .....Q
- Lathes, bench .....R
- Magnetizers .....S
- Manufacturing facilities .....T
- Marking & numbering machines .....U
- Metal forming machines .....V
- Molding presses .....W
- Oxy-acetylene .....X
- Powdered metal presses .....Y
- Punch presses .....Z
- Quartz cutting machines .....AA
- Riveting machines .....AB
- Shock testing machines .....AC
- Soldering machines .....AD
- Spot welders .....AE
- Temperature controlled ovens .....AF
- Vacuum tube machines .....AG
- Wire insulating machines .....AH
- Wire stripping machines .....AI
- X-ray pattern markers .....AJ
- Vacuum pumps .....AK



Acme Electric Heating Co., 1217 Washington St., Boston 18, Mass.—T  
 Acme Industrial Co., 200 N. Laffin St., Chicago 7, Ill.—T  
 Acme Oxygen Co., 119 S. 4 St., Harrison, N.J.—X  
 Aeromark Co., 9 Morrell St., Elizabeth 4, N.J.—F,U,Z  
 Air-Mite, 4417 E.W. Carroll Ave., Chicago 24, Ill.—Z  
 Alcar Instruments, 2 Godwin Ave., Fairlawn, N.J.—C  
 Allied Allegri Machine Co., 141 River Rd., Nutley 10, N.J.—T  
 Allied Engraving & Stamping Co., 161 Ellicott St., Buffalo 3, N.J.—M,U  
 American Photocopy Equip., 2849 N. Clark St., Chicago, Ill.—A  
 American Radio Hardware Co., 152 MacQuesten Parkway S., Mount Vernon, N.Y.—T  
 American Silver Co., 36-07 Prince St., Flushing, N.Y.—Q  
 Annis, Co., R.B., 1101 N. Delaware St., Indianapolis 2, Ind.—K,S,U  
 Applied Science Corp., P. O. Box 44, Princeton, N.J.—T  
 Art-Lloyd Metal Products Corp., 2973 Cropsey Ave., Brooklyn 14, N.Y.  
 Artos Eng'g. Co., 2757 28 St., Milwaukee 46, Wisc.—V, AI  
 Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, N.Y.—T  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—T,X  
 Barry Corp., 761 Pleasant St., Watertown 72, Mass.—Q,AC  
 Bassett, Inc., Rex, 1314 N. E. 17 Court, Fort Lauderdale, Fla.—J, AF  
 Batson Electronics Corp., J.A., 1031 S. 27 St., Omaha, Nebr.—D  
 Beach-Russ Co., 544 Union Ave., Brooklyn 11, N.Y.—AK  
 Beaver Pipe Tools, Inc., 310 Dana Ave., Warren, Ohio—V  
 Benchmark Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif.—Z  
 Beseler Co., Chas., 60 Badger St., Newark 8, N.J.—A  
 Black & Webster, Inc., 445 Watertown St., Newton 58, Mass.—U,Z,AB  
 BLILEY ELECTRIC CO., Union Station Bldg., Erie, Pa.—AF  
 Boehme, Inc., H.O., 915 Broadway, New York 10, N.Y.—T  
 Boesch Mfg. Co., Danbury, Conn.—C  
 Brady Co., W. H., 733 W. Glendale, Milwaukee, Wisc.  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—T  
 British Industries Corp., 164 Duane St., New York, N.Y.—C,G,L,M  
 Bruning Co., Charles, 4700 Montrose Ave., Chicago 41, Ill.—A

Buck Engineering Co., 37 Marcy St., Freehold, N.J.—T  
 Caltron Products Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.—K  
 Central Eng'g Corp., 560 Providence Highway, Norwood, Mass.—T  
 Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.—AK  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—N  
 Chicago Tool & Eng'g Co., 8383 S. Chicago Ave., Chicago 17, Ill.—L  
 Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—G,H  
 Clary Multiplier Corp., 408 Junipero St., San Gabriel, Calif.—D  
 Cleco Div., Reed Roller Bit Co., 5125 Clinton Ave., Houston 20, Texas.—B,AB  
 Clippard Instrument Lab. Inc., 7350 Colerain Rd., Cincinnati 24, Ohio.—T  
 Coil Winding Equipment Co., 19 Maxwell Ave., Oyster Bay, N.Y.—C  
 Cole Radio Works, 86 Westville Ave., Caldwell, N.J.—AD  
 Columbia Wire & Supply Co., 2850 Irving Park Rd., Chicago, Ill.—AI  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—T  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—N  
 Consolidated Vacuum Corp., 735 Ridge Rd., W. Rochester 3, N.Y.—J,AG,AK  
 CONSTANTIN & CO., L. L., Rt. 46, Lodi, N.J.—J  
 Contact, Inc., 238 Main St., Cambridge 42, Mass.—AD  
 Control Eng'g., 560 Providence Hwy., Norwood, Mass.—T  
 Cosa Corp., 405 Lexington Ave., New York 17, N.Y.—C,L,M,R,AH,AI  
 Cummins-Chicago Corp., 4740 Ravenswood Ave., Chicago 40, Ill.—T  
 Curran Machine Works, 20-20 Steinway St., Long Island City, N.Y.—T,U  
 Dale Products Inc., Columbus, Nebr.—O  
 Daven Co., 191 Central, Newark 4, N.Y.—T  
 Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—F,F,G,IAA  
 Dillon & Co., W.C., 14620 Keswick St., Van Nuys, Calif.—AC  
 DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.—G,L,R  
 Dumore Co., 1300 17 St., Racine, Wisc.—B  
 Eiser Eng'g. Co., 770 S. 13 St., Newark 3, N.J.—O,P,AE,AG  
 Elastic Stop Nut Corp., 2330 Vauxhall Rd., Union, N.J.—AC  
 Electro Craft Inc., 68 Jackson St., Stamford, Conn.—B,C,T  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—J  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—K  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—T  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—B  
 Eng'g Developments, 32 W. Pelham St., Newport, R.I.—S  
 Engineering Research Associates, Div. Remington Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—T  
 Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, RI.—D,O,P,T,U,AG,AH,AI,AK  
 Eraser Co., Rush Wire Stripper Div., 1063 S. Clinton St., Syracuse 4, N.Y.—AI  
 Fansteel Metallurgical Corp., N. Chicago, Ill.—T  
 Feiler Eng'g. & Mfg., Co., 8026 N. Monticello Ave., Skokie, Ill.—T  
 FINN & CO. T.R., 333 Jackson Ave., Bronx 54, N.Y.—N  
 Foredom Electric Co., 27 Park Place, New York 7, N.Y.—I  
 Gasket Eng'g. Co., 2444 Charlotte St., Kansas City 8, Mo.—V  
 Gates & Co., Geo. W., Franklin Square, Long Island, N.Y.—E  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—AF  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—AI  
 GENERAL ELECTRIC CO., APPARATUS DIV., 1 River Rd., Schenectady 5, N.Y.—N,O,S  
 GENERAL ELECTRIC CO., CARBOLOY Dept. 11177 E. Eight Mile Rd., Detroit 32, Mich.—K,S  
 Glaser-Steers Corp., 2 Main St., Belleville, N.J.—T  
 Gleason-Avery, Inc., 45 Aurelius Ave., Auburn, N.Y.—T  
 Gombos Co., John, 103 Montgomery Ave., Irvington, N.J.—T  
 Gorrell & Gorrell, Haworth, N.J.—T  
 Green Instrument Co., 385 Putman Ave., Cambridge 39, Mass.—M  
 Grieve-Hendry Co., 1815 W. Lake St., Chicago 12, Ill.—H

Gulton Mfg. Corp., Metuchen, N.J.—N,AC  
 Hallett Mfg. Co., 1601 W. Florence Ave., Inglewood, Calif.—T  
 Harder Co., Donald C., 3338 India St., San Diego 1, Calif.—C  
 Haydu Bros., Box 1226, Plainfield, N.J.—AE,AK  
 Helko Products Co., Inc., 243 W. 55 St., New York 19, N.Y.—M  
 Hercules Elec. Mach'y & Equip. Co., 1442 E. Washington Blvd., Los Angeles 21, Calif.—AE  
 Hevi Duty Electric Co., 4212 W. Highland Blvd., Milwaukee 1, Wis.—O  
 High Speed Hammer Co., 305 Norton St., Rochester, N.Y.—L,AB,AI  
 Hinde & Dauch, Sandusky, Ohio  
 Howard Industries, 1760 State St., Racine, Wisc.—B  
 Hubbell Inc., Harvey, State St. & Bostwick Ave., Bridgeport, Conn.—AI  
 Huppert, Co., K.H., 6880 Cottage Grove Ave., Chicago 37, Ill.—H,O,AF  
 Ideal Industries, 3316 Park Ave., Sycamore, Ill.—K,M,AD,AI  
 Impact-O-Graph Corp., 1900 Euclid Bldg., Cleveland 15, Ohio—AC  
 Independent Mfg. Co., 5 Bellevue Ave., E. Riverton, N.J.—T,AI  
 Induction Motors Corp., 55-15 37 Ave., Woodside 77, N.Y.—B  
 Industrial Electronic Eng'rs., 3973 Lankershim Blvd., N. Hollywood, Calif.  
 Inet, Inc., 8655 S. Main St., Los Angeles 3, Calif.—U  
 Instrument Labs., 315 W. Walton Pl., Chicago, Ill.—T  
 Int'l. Pump & Machine Works, 11 Governor St., Newark 2, N.J.—AK, AN  
 Int'l Radiant Corp., 40 Matinecock Ave., Port Washington, N.Y.  
 Jefferson, Ray, 40 E. Merrick Rd., Freeport, N.Y.—J  
 Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.—B  
 KAHLE ENG'G. CO., 1307 Seventh St., North Bergen, N.J.—P,AE,AG,AK  
 Karp Metal Products Co., 215 63 St., Brooklyn 20, N.Y.—T  
 Kinney Mfg. Co., 3529 Washington St., Boston 30, Mass.—AK  
 Klein-Electronics Mfg. Co., Leo, 2404 S. La Brea Ave., Los Angeles 16, Calif.—K,S  
 Knights Co., James, Sandwich, Ill.—H,AF  
 L.A.B. Corp., 31 Union Pl., Summit, N.J.—AC  
 LaPointe Electronics Co., 155 W. Main St., Rockville, Conn.—T  
 Lavoie Laboratories, Inc., Morganville, N.J.—AF  
 Leiman Bros., 146 Christie St., Newark 5, N.J.—B,I,U,AK  
 Lenox Instrument Co., 2010 Chancellor St., Phila., Pa.  
 Lepel High Frequency Laboratories, Inc., 54-18 37 Ave., Woodside 77, Long Island, N.Y.—AD  
 Linde Air Products Co., Div. Union Carbide & Carbon, 30 E. 42 St., New York 17, N.Y.—X,AF  
 Littell Machine Co., F.J., 4127 Ravenswood Carlos, Calif.—O,P,Z,AE,AK  
 Litton Eng'g. Labs., 1049 Brittan Ave., San Carlos, Calif.—O,P,AE,AK  
 Lovins Engineering Corp., 8203 Cedar St., Sil-Ave., Chicago 13, Ill.—G,Z  
 Luffkin Rule Co., 1730 Hess St., Saginaw, Mich.—K  
 Luma Electric Equip. Co., 112 Dorr St., Toledo, Ohio—AD  
 L & O Research & Devel., 134 N. Wayne Ave., Wayne, Pa.—AF  
 Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y.—T  
 Marion Electrical Instrument Co., 401 Canal St., Manchester, N.H.—AD  
 Markem Machine Co., 150 Congress St., Keene, N.H.—U  
 Mars Electronics Corp., 3000 N. San Fernando Blvd., Burbank, Calif.—T  
 Master Appliance Mfg., Co., Fourth & Ontario Sts., Racine, Wis.—B,T  
 May Eng'g. Co., 6055 Lankershim Blvd., North Hollywood, Calif.—D,U  
 MB Mfg. Co., 1060 State St., New Haven 11, Conn.—AC, AN  
 Mico Instrument Co., 80 Trowbridge St., Cambridge 38, Mass.—C,M  
 Milford Rivet & Machine Co., Milford, Conn.—AB  
 Mission-Western Engineers, 132 W. Colo. St., Pasadena 1, Calif.—T  
 Monitor Products Co., 815 Fremont Ave., S. Pasadena, Calif.—AF  
 Muckel Mfg. Co., Owatonna, Minn.  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—P,AG  
 Murphy & Miller, 1322 S. Michigan Ave., Chicago 5, Ill.  
 National Co., 61 Sherman St., Malden 48, Mass.—T  
 National Research Corp., Equip. Div., 70 Memorial Dr., Cambridge 42, Mass.—O,AG,AK  
 New Hermes Inc., 13 University Pl., New York 3, N.Y.—G,M  
 Nestor Eng'g. Co., 24 Chestnut St., Rutherford, N.J.—T  
 Nilsson Electrical Lab., 103 Lafayette St., New York 13, N.Y.  
 N.R.K. MFG. & ENG. CO., 4601 Addison St., Chicago 41, Ill.—T



O'Neil-Irwin Mfg. Co., 300 Eighth Ave., Lake City, Minn.—V,Z  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—T  
 Paragon-Revolute Corp., 77 South Ave., Rochester 4, N.Y.—A  
 Parts Producing Corp., Manhattan Div., 1861 Second Ave., New York 28, N.Y.—T  
 PECK & HARVEY, 5650 N. Western Ave., Chicago, Ill.—A  
 Pereny Equip Co., 893 Chambers Rd., Columbus 12, Ohio—AF  
 Peschel Electronics, 13 Garden St., New Rochelle, N.Y.—T  
 Petroff, Peter A., 127 Water St., New York 5, N.Y.—T  
 Phila. Scientific Glass Co., Abington, Pa.—AE, AF,P  
 Phoenix Precision Instrument Co., 3803 N. Fifth St., Philadelphia 40, Pa.—P  
 Pioneer Patents & Products Co., 3720 N. New England Ave., Chicago 34, Ill.—T  
 Pittsburgh Lectrodryer Corp., Foot 32 St., Pittsburgh 30, Pa.  
 Pix Mfg., Co., 22 Bedford St., Newark 3, N.J.—T  
 Poinsettia Co., 112 Cedar Ave., Pitman 15, N.J.—W  
 Polytech Devices, Inc., 1180 E. Grand St., Elizabeth, N.J.—F,G,I,J,T,AA,AF  
 Popper & Sons, 300 Fourth Ave., New York 10, N.Y.—V  
 Portable Electric Tools, Inc., 200 W. 83 St., Chicago 20, Ill.—B,T  
 Precise Measurements Co., 942 King Highway, Brooklyn 23, N.Y.—T,U  
 Precision Products, 719 7 St., N.W., Washington, D.C.—I,T  
 Preis Engraving Mach. Co., H.P., Hillside 5, N.J.—M,U  
 Production Tool and Fixture Co., 37 W. Main St., Oyster Bay, N.Y.  
 Protectoseal Co., 1920 S. Western Ave., Chicago 8, Ill.  
 Radio Frequency Labs., Boonton, N.J.—S  
 RAYTHEON MFG. CO., Waltham 54, Mass.—A,U  
 Remco Mfg., Co., 545 N. LaSalle St., Chicago 10, Ill.—T  
 Richardson Labs. Kenneth, 254 Vincent Ave., Lynbrook, N.Y.—K,S  
 Robinson, Inc., Edward E., 95 Park Ave., Nutley 10, N.J.  
 Rotron Mfg. Co., Schoonmaker Lane, Woodstock, N.Y.—B  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—C,K,S  
 Ryerson & Son, Joseph T., Box 8000-A, Chicago 80, Ill.—V  
 Saxl Instrument Co., Harvard, Mass.—C  
 Schmidt, Inc., Geo. T., 1804 Belle Plaine Ave., Chicago 13, Ill.—U  
 Schauer Mfg. Corp., 4500 Alpine Ave., Cincinnati 36, Ohio—B,T  
 Scientific Electric Div., "S" Corrugated Quenched Cap Co., 107 Monroe St., Garfield, N.J.—O  
 Secom Metals Corp., 228 E. 45 St., New York 17, N.Y.—T  
 Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—T,W  
 Stanat Tool & Machine Co., 47-28 37 St., Long Island City 1, N.Y.—T,V  
 Standard Cabinet Co., 56 Washington Ave., Carlstadt, N.J.  
 Standard Pressed Steel Co., Box 899, Jenkintown, Pa.  
 Star Expansion Products Co., 147 Cedar St., New York 6, N.Y.—I,T  
 Sta-Warm Electric Co., 553 N. Chestnut St., Ravenna Ohio—AD  
 Stevens Mfg. Co., George, 6022 N. Rogers Ave., Chicago 30, Ill.—C,AE  
 Stewart Eng'g Co., Box 145, Soquel, Calif.  
 Stokes Machine Co., F.J., 5500 Tabor Rd., Philadelphia 20, Pa.—W,Y,AK  
 Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.  
 Sunrise Products Co., P. O. Box 173, Hawthorne, N.J.—A,C,U,AD,AE  
 Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—M,Q  
 Telectronics Laboratory, 54 Kinkel St., Westbury, Long Island, N.Y.—J,L  
 Tenney Eng'g. Inc., 26 Avenue B., Newark 5, N.J.—A,T  
 Thomas & Sons, Wm., 91 Pearl St., Brooklyn 1, N.Y.—T  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—A,L,R,AE  
 Torit Mfg. Co., 292 Walnut St., St. Paul 2, Minn.—AD  
 Tricon Mfg. Co., 8008 Wallace St., Chicago 20, Ill.—T  
 Tri-Dex Co., P. O. Box 1207, Lindsay, Calif.—T  
 Trion Inc., 1000 Long Island Ave., McKees Rocks, Pa.—Q  
 Universal Winding Co., P. O. Box 1605, Providence 1, R.I.—C  
 U.S. Testing Co., 1550 Park Ave., Hoboken, N.J.—T  
 Vacuum-Electronic Eng'g. Co., 86 Denton Ave., New Hyde Park, L.I., N.Y.  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—P,AE  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—T  
 Vibroscope Co., 6 E. 39 St., New York 16, N.Y.—AF,N

Walker Electric Co., B., 132 Nassau St., New York 7, N.Y.—T  
 WALL MFG. CO., P., Erie St., Grove, Pa.—AD  
 Wasserlein Mfg. Co., 126 W. Cass St., Joliet, Ill.—AD  
 Welch Mfg. Co., W.M., 1515 Sedgwick Ave., Chicago 10, Ill.—AK  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—AF  
 Western Gold & Platinum Works, 589 Bryant St., San Francisco 7, Calif.—O  
 Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.—B  
 WHITE DENTAL MFG. CO., 10 E. 40 St., New York 16, N.Y.—V  
 WHITE & SON, JAMES L., 374 Verona Ave., Newark 4, N.J.—T  
 Whittington Pump & Engineering Corp., 1126 Prospect St., Indianapolis 3, Ind.—AK  
 Wiedemann Machine Co., 4272 Wissahickon Ave., Philadelphia 32, Pa.—Z  
 Wilder Mfg. Co., Port Jervis, N.Y.—AD  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.  
 Windsor, 999 N. Main St., Glen Ellyn, Ill.—P  
 Woodruff & Stokes, 349 Lincoln St., Hingham, Mass.

## 68—RADAR DEVICES

**Aircraft landing control** . . . . . A  
**Altimeters** . . . . . B  
**Antennas** . . . . . C  
**Indicators, plan position** . . . . . D  
**Indicators, proximity** . . . . . E  
**Marine navigation** . . . . . F  
**Oscilloscopes** . . . . . G  
**Radar** . . . . . H  
**Receivers** . . . . . I  
**Repeaters** . . . . . J  
**Transmitters** . . . . . K

Aeronautical Radio Mfg. Co., 155 First St., Mineola, N.Y.—A,B  
 Ainslie Electronic Products, 312 Quincy Ave., Quincy, Mass.—C  
 Aircraft Armaments, Inc., 4415 Reisterstown Rd., Baltimore 15, Md.—D,E,G,I,J,K  
 Air Assoc., Inc., Teterboro, N.J.—K  
 Allied Research & Eng'g., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—C  
 American Machine & Foundry Co., 1085 Commonwealth Ave., Boston, Mass.—C,H,J,K  
 ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—C  
 Ansley Electronic Inc., 85 Tremont St., Meriden, Conn.—A,C,D,H,I,K  
 Austin Co., 76 Ninth Ave., New York 11, N.Y.—D,J  
 BENDIX RADIO DIV., BENDIX AVIATION CORP., E. Joppa Rd., Towson 4, Md.—A,C,D,I,K  
 BENDIX AVIATION CORP., PACIFIC DIV., 11600 Sherman Way North Hollywood, Calif.—I,K  
 POGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—C,D,G,I,J,K  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—E  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,B,C,D,G,I,K  
 Browning Labs., Inc., 750 Main St., Winchester, Mass.—G  
 Canoga Corp., 5955 Sepulveda Blvd., Van Nuys, Calif.—C,D,G,H,I,K  
 CRS Columbia Inc., 170—53 St., Brooklyn 32, N.Y.—I,K  
 CENTURY ELECTRONICS, DIV. CENTURY METALCRAFT CORP., 14806 Oxnard St., Van Nuys, Calif.—C,G  
 Cubic Corp., 2841 Canon St., San Diego 6, Calif.—D  
 Custom Electronics Corp., 738 Speedwell Ave., Morris Plains, N.J.  
 DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—H,I  
 Dormitzer Electric & Mfg., Co., 5 Hadley St., Cambridge 40, Mass.—K  
 Dorne & Margolin, 30 Sylvester St., Westbury, N.Y.—C  
 DuMONT LABS., INC., ALLEN B., Instrument Div., 760 Bloomfield Ave., Clifton, N.J.—G  
 DuMONT LABS., INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—H  
 Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—G  
 Electrotechnic Corp., 15601 Arrow Hwy. Azusa, Calif.—B,G,I  
 Emerson Electric Mfg., Co., 8100 Florissant Ave., St. Louis 21, Mo.—C,D,G,H,I,K  
 Eng'g Assoc., 434 Patterson, Dayton 9, Ohio—K  
 Esbey Mfg., Co., 528 E. 72 St., New York 21, N.Y.—A,B,D,G,I,K  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—H  
 Freed Electronics & Controls Corp., 200 Hudson St., New York, N.Y.—A,B,D,F,G,H,I,K  
 GENERAL ELECTRIC CO., Syracuse, N.Y.—H,I,K  
 General Electrosonics, Inc., 32 W. 22 St., New York 10, N.Y.—C  
 Haller, Raymond & Brown, Inc., 124 N. Atherton St., State College, Pa.—D,I  
 Ideco Division Dresser Stacey Co., 875 Michi-

gan Ave., Columbus 15, Ohio—C  
 Imperial Radar & Wire Corp., 4342 Bronx Blvd., New York 66, N.Y.—C  
 I-T-E Circuit Breaker Co., 19 & Hamilton Sts., Philadelphia 30, Pa.—C  
 Johnson Labs, Div., of Aladdin Industries, Willard Rd., Norwalk, Conn.—I  
 Kinetix Instruments Co., 902 Broadway, New York 10, N.Y.—I,J,K  
 Korb Eng'g. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—H,I,K  
 Lab for Electronics, 75 Pitts St., Boston, Mass.—A,D,E,G,I,J,K  
 Loral Electronics Corp., 794 E. 140 St., New York 54, N.Y.—I  
 MAGNAVOX CO., Fort Wayne 4, Ind.—B,C,I,K  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,E,I  
 Mark Products Co., 3547 Montrose Ave., Chicago 18, Ill.—C  
 Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—A  
 Maxson Corp., W. L., 460 W. 34th St., New York 1, N.Y.—C,I,K  
 N.R.K. MFG. & ENG'G CO., 4601 W. Addison St., Chicago 41, Ill.—H  
 Petroff, Peter A., 127-9 Water St., New York 5, N.Y.—C,D,H  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—A  
 Premier Instrument Corp., 52 W. Houston St., New York 12, N.Y.—C  
 Press Wireless Mfg., Co., 155 W. Main St., Rockville, Conn.—C,H,I,J,K  
 RADIO CORP. OF AMERICA, Camden, N.J.—H  
 Radar Electronics Inc., 229 W. 28 St., New York 1, N.Y.—I,H,K  
 RAYTHEON MFG. CO., Waltham 54, Mass.—A,B,C,D,F,H,I,J,K  
 Raytheon TV & Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill.—H,I,K  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—I  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—A,C,D,E,F,G,I,K  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—C  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—C  
 Ryan Industries, 19159 John R. St., Detroit 3, Mich.—H,J  
 Servo-Tek Products Co., 1086 Goffe Rd., Hawthorne, N.J.—J  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—K  
 Spartan Radio-Television, 2400 E. Ganson St., Jackson, Mich.—I  
 Sperry Gyroscope Corp., Great Neck, N.Y.—A,I,K  
 Syntronic Instruments, Inc., 100 Industrial Rd., Addison, Ill.—D  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,C,I,J,K  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—G  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—G,J,K,I  
 Tektronix, Inc., Box 831, Portland 7, Ore.—G  
 Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland 3, Ohio—C  
 Trieflex Inc., 500 Frelinghuysen Ave., Newark 5, N.Y.—C  
 Transmitter Equipment Mfr. Co., 345 Hudson St., New York 14, N.Y.—D,I,K  
 Tricraft Products Co., 1535 N. Ashland Ave., Chicago 22, Ill.—C  
 Union Spring Mfg. Co., 105 Summit Ave., Jersey City 7, N.J.—H,I,K  
 Univex Corp., 102 Warren St., New York 7, N.Y.—I  
 Vectron, Inc., 400 Main St., Waltham 54, Mass.—A,D,G  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—G  
 WESTINGHOUSE ELECTRIC CORP., 2519 Wilkens Ave., Baltimore 3, Md.—J  
 White Industries, 421 W. 54 St., New York 19, N.Y.—C,I,K  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio—C,D  
 WORKSHOP ASSOCIATES DIV., GABRIEL CO., Endicott St., Norwood, Mass.—C

## GEOGRAPHICAL LIST of DISTRIBUTORS

This is a complete interfiling of distributors—giving names of firms and addresses. This complete and accurate list of electronic distributors is arranged alphabetically under states and cities.

**TELE-TECH**  
& ELECTRONIC INDUSTRIES

# 69—RECEIVERS, COMMUNICATION

- Converters, FM ..... O
- Converters, TV ..... P
- Preselectors ..... Q
- Receivers, amateur ..... A
- Receivers, AM communication ..... B
- Receivers, aviation fixed ..... C
- Receivers, aviation mobile ..... D
- Receivers, battery portable ..... E
- Receivers, diversity ..... R
- Receivers, fixed frequency ..... F
- Receivers, FM communication ..... G
- Receivers, marine ..... H
- Receivers, police ..... I
- Receivers, railroad ..... J
- Receivers, remote pickup fixed ..... K
- Receivers, remote pickup, mobile ..... L
- Receivers, UHF ..... M
- Receivers, VHF ..... N



Dayton Aviation Radio & Equip. Corp., P. O. Box 167, Vandalia, Ohio—D  
 DeWald Radio United Scientific Lab., Inc., 35-15 37th Ave., L.I.C. 1, N.Y.—B,E,M,N,O, P,Q  
 Dollar Co., Robert. Communications Equipment Div., 50 Drumm St., San Francisco, Calif.—A,B,F,R  
 DUMONT LABS., INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—G  
 Eckstein Radio & TV Co., 3400 E. 42nd St., Minneapolis 6, Minn.—A,B  
 Eldico of N.Y., Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—A,B,C,D,F,H,J,M  
 Electromatic Mfg. Corp., 88 University Pl., New York 3, N.Y.—B,G  
 Electron Enterprises, 6917 W. Stanley Ave., Berwyn, Ill.—E,F,M,P  
 Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—B,F,G,M,N  
 Electro-Voice, Inc., Cecil and Carroll Sts., Buchanan, Mich.—A,B,G,N,P  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—F  
 El-Tronics, Inc., 5th & Noble Sts., Phila. 23, Pa.—B,F  
 Eng'g. Associates, 434 Patterson Rd., Dayton 9, Ohio—B,C,D,M,N  
 Erco Radio Labs., Stewart Ave., Garden City, N.Y.—B,C,F,G,H,I,M,N,R  
 Esney Mfg. Co. 528 E. 72nd St., New York 21, N.Y.—A,B,C,D,E,F,G,H,I,J,K,L,M,N,Q  
 Esquire Radio Corp., 6201 15 Ave., Brooklyn 19 N.Y.—E  
 Fada Radio & Electric Co., 525 Main St., Belleville, N.J.—E,M,N  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—F  
 Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—R  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—L,J  
 Feiler Eng'g. & Mfg. Co., 8023 N. Monticello Ave., Skokie, Ill.—B,G,I,J,O,P  
 Fisher Research Lab., Inc., 1961 University Ave., Palo Alto, Calif.—H  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—A,B,C,D,F,G,H, I,O,P,Q  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—B F,G  
 Garod Radio Corp., 70 Washington St., Brooklyn 1, N.Y.—B,E  
 GENERAL ELECTRIC CO., Receiver Dept., Syracuse, N.Y.—E,M,N,P  
 General Instrument Corp., 829 Newark Ave., Elizabeth 3, N.J.—P  
 G & M Equipment Co., 7315 Varma Ave., N. Hollywood, Calif.—E,G,H,M,N,Q  
 Granco Products Inc., 36-17 20 Ave., L.I.C. 5, N.Y.—P,Q  
 Grem Eng'g. Co., 492 3 St., Brooklyn 15, N.Y.—P  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—D  
 Hallcrafters Co., 4401 W. 5 Ave., Chicago 24, Ill.—A,B,E,G,J,M,N,P  
 HAMMARLUND MFG. CO., 460 W. 34 St., New York 1, N.Y.—A,B,C  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—G,J,K,I  
 Harvey Radio Labs., 447 Concord Ave., Cambridge 38, Mass.—C,D

Harvey-Wells Electronics, Southbridge, Mass.—C,D  
 H'dco Mfg. Corp., 161 W. Huron St., Chicago 10, Ill.—E  
 Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.—C,D,R  
 Hudson American Corp., 25 W. 43 St., New York, N.Y.—H  
 IDEA, INC., 7900 Pendleton Pike, Indianapolis 26, Ind.—M,P  
 Int'l. Research Corp., 2221 Warwick Ave., Santa Monica, Calif.—F,P  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—C,D  
 Jefferson, Ray, 40 E. Merrick Rd., Freeport, N.Y.—H  
 Jewel Radio Corp., 900 Passaic Ave., E. Newark, N.J.—B,E  
 Johnson Laboratories, Div. of Aladdin Industries, Inc., Norwalk, Conn.—M,N,O,P  
 Kaar Eng'g. Corp., 2995 Middlefield Rd., Palo Alto, Calif.—B,F,G,I,M,N,Q  
 Kaye-Halbert Corp., 3623 Eastham Drive, Culver City, Calif.—M,N,P  
 Kingston Products Corp., 1412 N. Webster St., Kokomo, Ind.—Q  
 KOLLSMAN INSTRUMENT CORP., 80-08 45 Ave., Elmhurst 73, N.Y.—C,D  
 Lavoie Labs., Inc., Morganville, N.J.—M,N,Q  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—B,C,D,E,F,H,M,N  
 Leonard Electric Products Co., 67 34 St., Brooklyn 32, N.Y.—M  
 Lyco Mfg. Co., 1401 Clinton St., Hoboken, N.J.—F,H,I  
 Mackay Radio & Telegraph Co., 345 Hudson St., New York 14, N.Y.—H  
 McLaughlin, J.L.A., La Jolla, Calif.—O,P  
 MAGNAVOX CO., Fort Wayne 4, Ind.—M,N  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—C,I  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis, Ind.—P  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—B  
 Marine View Electronics, 744 E. 138 St., New York 54 N.Y.—H  
 Mattison TV & Radio Corp., 10 W. 181 St., New York 53, N.Y.—M  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—B,F  
 MELPAR, INC., 452 Swann Ave., Alexandria, Va.—M  
 Microtran Co., Div., Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach, 93, N.Y.—P  
 Mitchell Industries, Inc., Mineral Wells, Texas C,D,E  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—A,B,C,D,E,F,G,H,I,J,K,L,O,P,Q  
 Motorola Inc. 4545 W. Augusta Blvd. Chicago Ill.—A,B,E,F,G,I,J,K,L  
 National Aeronautical Corp., 180 S. Main St., Ambler, Pa.—C,D  
 NATIONAL CO., 61 Sherman St., Malden 48, Mass.—A,B,F,M,N,R  
 National Electronic Labs., 1713 Kalorama Rd., N.W., Washington 9, D.C.—N  
 Northern Radio Co., 145 W. 22 St., New York 11, N.Y.—R  
 Olympic Radio & TV Inc., 34-01 38 Ave., Long Island City 1, N.Y.—E,N  
 Pacific Mercury TV Mfg. Corp., 5955 Van Nuys Blvd., Van Nuys, Calif.—B,D,E,M,N  
 Packard-Bell Co., 12333 W. Olympic Blvd., W. Los Angeles, Calif.—M,N  
 Pearce-Simpson, Inc., 3023 Coral Way, Miami 34, Fla.—H  
 Pilot Radio Corp., 37-06 36 St., Long Island City 1, N.Y.—E,M,N  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—B  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn, N.Y.—B,G,M,N  
 Pratt, Albert, 1939 N. 18 St., Milwaukee 5, Wisc.—I  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—B,G  
 Radar-Electronics Inc., 229 W. 28th St., New York 1, N.Y.—P  
 Radio Apparatus Corp., 55 N. New Jersey St., Indianapolis, Ind.—B,F,G,I,N  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV. ENG'G. PRODUCTS DIV., Camden 2, N.J.—G,I,R  
 Radio Eng'g. Labs., 36-40 37 St., Long Island City 1, N.Y.—G,K,M  
 Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—A,B,O  
 Radio Mfg. Engineers, Inc., 300 1 Ave., Peoria 6, Ill.—A,B,M,N,Q  
 RADIO RECEPTOR CO., 84 N. 9 St., Brooklyn 11, N.Y.—C,M,N,P,Q  
 Radio & TV Inc., Brunswick Div., 119 W. 57 St., New York 19, N.Y.—M,N  
 Railway Communications Inc., Raytown, Mo.—J,N  
 RAYTHEON MFG. CO., Waltham 54, Mass.—H  
 Raytheon TV & Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill.—M,N  
 Remco Mfg. Co., 545 N. La Salle St., Chicago 10, Ill.—B  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—C,D,H  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—C,D,F,H,J  
 Rex Electronics Corp., 1351 E. De Loss St., Indianapolis, Ind.—I,O,P  
 Reynolds Radio & Equip. Lab., H.B., 219 Stone St., Oneida, N.Y.—G,I

## PROPERTIES OF METALS

Metal	Relative Resistance	Specific Gravity	Melting Point °C
Aluminum	1.64	2.7	660
Brass	3.9	8.47	920
Cadmium	4.4	8.64	321
Cobalt	5.6	8.71	1480
Constantan	28.45	8.9	1210
Copper	1.00	8.89	1083
Gold	1.416	19.32	1063
Iron (cast)	5.6	7.87	1535
Lead	12.78	11.37	327
Magnesium	2.67	1.74	651
Manganin	26	8.5	910
Mercury	55.6	13.55	-38.87
Molybdenum	3.3	10.2	2622
Monel	27.8	8.8	1350
Nichrome	65	8.25	1350
Nickel	5.05	8.85	1425
Nickel silver	16	8.72	1110
Phosphor bronze	5.45	8.9	1050
Platinum	6.14	21.4	1773
Silver	0.95	10.5	960.5
Steel	7.6-12.7	7.8	1480
Steel (stainless)	52.8	7.9	1410
Tantalum	9.0	16.6	2850
Tin	6.7	7.3	231.9
Tungsten	3.25	19.2	3370
Zinc	3.4	7.14	419.5
Zirconium	2.38	6.4	1860

Rich Electronics, Inc., 212 N.W. 8 Ave., Miami 36, Fla.—H  
Schutter Mfg. Co., Carl W., 80 E. Montauk Highway, Lindenhurst, N.Y.—C  
Smith-Meeker Eng'g Co., 157 Chambers St., New York 7, N.Y.—J  
Sonar Radio Corp., 3050 W. 21 St., Brooklyn 24, N.Y.—A,B,D,E,G,H,I,J  
Spartan Radio-TV 2400 E. Ganson St., Jackson, Mich.—D,E,M,N,P  
Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—B  
Specific Products, 5864 Hollywood Blvd., Hollywood 28, Calif.—F  
Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—P  
Spera Electronics Lab., 37-10 33 St., Long Island City, N.Y.—A,G,I,K,L,M,N  
Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—H  
Steelman Phono. & Radio Co., 12 Anderson St., Mt. Vernon, N.Y.—E  
Stromberg-Carlson Co., Rochester 3, N.Y.—C,N  
Sutton Electronic Co., 426 W. Short St., Lexington, Ky.—P  
SYLVANIA ELECTRIC PRODUCTS, RADIO-TV DIV., 254 Rano St., Buffalo, N.Y.—E,M,N  
SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—E,M,N  
Syntronic Instruments, Inc., 100 Industrial Rd., Addison, Ill.—G  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—C,D,M,N  
Tech-Master Products Co., 443 Broadway, New York 13, N.Y.—M,N  
Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—B,F,G,H,M,N  
Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—E  
Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—O  
Trad Television Corp., 1001 First Ave., Asbury Park, N.J.—R  
Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—B,C,F,G,I,K,L,M,N  
Trutone Electronic Eng'g Co., 812 N. Highland Ave., Los Angeles 38, Calif.—E  
TURNER CO., 909 17 St., N.E., Cedar Rapids, Iowa—O,P  
Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—C,D,F,H  
VECTRON, INC., 400 Main St., Waltham 54, Mass.—M  
Videon Electronic Corp., 222 E. Ohio St., Indianapolis 4, Ind.—P  
Video Products Corp., 42 West St., Red Bank, N.J.—M,N,P

West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—E,F,G,I,J,K,L,N  
Western Mfg. Co., 1400 W. 22nd St., Kearney, Nebr.—A,B,E,F,G,I,O,P  
Westrex Corp., 111 8 Ave., New York 11, N.Y.—B,C,F  
White Industries, Inc., 421 W. 54 St., New York 19, N.Y.—C,M,N  
White & Sons, Inc., Wilfred O., 178 Atlantic Ave., Boston 10, Mass.—H  
Wilcox Electric Co., 1400 Chestnut St., Kansas City 1, Mo.—B,C,D

## 70—RECEIVERS, HOME

**Converters, FM** ..... N  
**Converters, TV** ..... O  
**Preselectors** ..... P  
**Receivers, AM** ..... A  
**Receivers, AM-FM** ..... B  
**Receivers, automobile** ..... C  
**Receivers, battery portable** ..... D  
**Receivers, coin operated** ..... E  
**Receivers, construction kits** ..... F  
**Receivers, FM** ..... G  
**Receivers, phono-radio comb.** ..... H  
**Receivers, recorder-radio comb.** ..... I  
**Receivers, TV** ..... J  
**Receivers, TV combination** ..... K  
**Receivers, UHF** ..... L  
**Receivers, VHF** ..... M  
**Television Boosters** ..... Q

ABC Radio Labs., 3334 W. New Jersey St., Indianapolis, Ind.—N  
Admiral Corp., 3800 Cortlandt St., Chicago 47, Ill.—A,J  
Aeronautical Radio Mfg. Co., 155 1 St., Minnola, N.Y.—L,M  
Air Associates Inc., 511 Joyce St., Orange, N.J.—L,M  
Airtrox Devel. Corp., 20 W. 22 St., New York 10, N.Y.—A,D,H  
Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—D  
Andrea Radio Corp., 27-01 Bridge Plaza N., Long Island City 1, N.Y.—D,J,K,L,M  
Ansley Electronics, Inc., 85 Tremont St., Meriden, Conn.—J  
Ansley Mfg. Co., Arthur, Doylestown, Pa.—B,H  
Approved Electronic Instrument Corp., 928 Broadway, New York 10, N.Y.—B,G,O  
Arvin Industries, Inc., Columbus, Ind.—A,B,D,H,J,M  
Astatic Corp., 250 Harbor St., Conneaut, Ohio—Q  
Audio-Master Corp., 341 Madison Ave., New York 17, N.Y.—H  
Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—B,L,M  
Automatic Radio Mfg. Co., 122 Brookline Ave., Boston 15, Mass.—A,B,C,D,H,J  
Bace Television Corp., Green & Lenning St., S. Hackensack, N.J.—J,L,M,Q  
Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—A,H  
Bell Television, Inc., 254 W. 54 St., New York 19, N.Y.—J  
BENDIX RADIO DIV., BENDIX AVIATION Corp., Baltimore 4, Md.—A,J  
BLONDER-TONGUE T ABS., 526 North Ave., Westfield, N.J.—J,L,M  
BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—L  
Bogen Co., David, 29 9 Ave., New York 14, N.Y.—A,B,G,O,Q  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A,B,C,D,F,H,I,J,K,L,M,N,O,Q  
Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—L,M  
Calbest Eng'g. & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—A,D,E,G,H,J,K,N,O  
Canoga Corp., 5955 Sepulveda Blvd., Van Nuys, Calif.—L  
Capehart-Farnsworth, 3700 Pontiac St., Ft. Wayne 1, Ind.—A,J  
Castlewood Mfg. Co., 1430 S. 12 St., Louisville 10, Ky.—H,J  
C-B-C Electronics Co., 1310 Callowhill St., Philadelphia, Pa.—Q  
CBS-Columbia Inc., 170 53 St., Brooklyn 32, N.Y.—A,B,H,J,K  
Certified Radio Labs., 5507 13 Ave., Brooklyn 19, N.Y.—J  
C. G. S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—L,M  
Channel Master Corp., Ellenville, N.Y.—Q  
Colortone TV Co., 238 William St., New York 38, N.Y.—K  
Communication Devices Co., 2331 12 Ave., New York 27, N.Y.—D,M  
Communications Co., 300 Greco Ave., Coral Gables, Fla.—M  
Conrac, Inc., 19217 E. Foothill Blvd., Glendora, Calif.—B,G,J  
Coradio, Inc., 196 Albion Ave., Patterson 2, N.J.—E  
Coronet Radio & TV Corp., 1451 E. 27 St., Brooklyn 10, N.Y.—A,D,E  
Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—Q  
Crosley Div., Avco Mfg. Corp., Cincinnati 25, Ohio—A,J

Crown Eng'g., 3821 Commercial NE., Albuquerque, N.M.—L,M  
Cubic Corp., 2841 Canon St., San Diego 6, Calif.—L  
Davis & Co., J. W., 9212 Denton Dr., Dallas 9, Texas—A,D,H  
DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—B,C,D,E,F,G,H,I,J,K,L,M,N,O,P  
DUMONT LABORATORIES INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—J,K,L,M,Q  
DUMONT LABS., INC., ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—J,K,L,M  
Eckstein Radio & TV Co., 3400 E. 42 St., Minneapolis 6, Minn.—A,C,H  
Edu-Craft Sales Corp., 150-45 12 Ave., White-stone, N.Y.—I  
Eldico of N.Y., Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—C,F,L  
Electromatic Mfg. Corp., 88 University Pl., New York 3, N.Y.—A,G  
Electron Enterprises, 6917 W. Stanley Ave., Berwyn, Ill.—A,D,E,L,M  
Electrotech Corp., 15601 Arrow Hwy., Azusa, Calif.—L,M  
Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—M,O  
Elex Co., 69-19 215 St., Bayside 64, N.Y.—B,F,H,I,J  
Elm Labs., 18 S. Bdway., Dobbs Ferry, N.Y.—P  
Emerson Radio & Phono. Corp., 111 8 Ave., New York 11, N.Y.—A,B,D,H,I,J,K  
Eng'g. Associates, 434 Patterson Rd., Dayton 9, Ohio—L,M  
Erco Radio Labs., Stewart Ave., Garden City, N.Y.—L,M  
Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,G,H,I,J,K,P,Q  
Esquire Radio Corp., 6201 15 Ave., Brooklyn 19, N.Y.—A,B,D,E,G,H,I  
Fada Radio & Electric Co., 525 Main St., Belleville, N.J.—A,B,D,J,L,M  
FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—B  
Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—H,N,O,Q  
Fisher Radio Corp., 45-41 Van Dam St., Long Island City 1, N.Y.—A,B,G,H  
Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—A,B,G,H,I,J,L,M,N,O,P,Q  
Garod Radio Corp., 70 Washington St., Brooklyn 1, N.Y.—A,D,G,J,K  
GENERAL ELECTRIC CO., Radio TV Dept., Electronics Park, Syracuse, N.Y.—A,B,G,J  
General Instrument Corp., 829 Newark Ave., Elizabeth 3, N.J.—O  
G & M Equip. Co., 7315 Varna Ave., No. Hollywood, Calif.—D,L,M,P  
Granco Products Inc., 36-17 20 Ave., Long Island City 5, N.Y.—O,P  
Grem Eng'g Co., 492 3 St., Brooklyn 15, N.Y.—J  
Hallcrafters Co., 4401 W. 5 Ave., Chicago 24 Ill.—A,B,D,H,J,K,L,M,O  
HEATH CO., Benton Harbor 24, Mich.—F  
Hedco Mfg. Corp., 161 W. Huron St., Chicago 10 Ill.—A,D,H  
Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.—J  
Hotel Radio Corp., 1040 W. Fort St., Detroit 26, Mich.—E  
IDEA, INC., 7900 Pendleton Pike, Indianapolis 26, Ind.—L,O,Q  
Industrial TV, Inc., 369 Lexington Ave., Clifton, N.J.—J  
Int'l. Research Corp., 2221 Warwick Ave., Santa Monica, Calif.—J,O  
Int'l. TV Corp., 238 William St., New York 7, N.Y.—J  
Jackson Industries, 500 E. 40 St., Chicago 15, Ill.—A,B,H,I,J,K  
Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—C  
Jerrold Electronics Corp., 26 & Dickinson Sts., Philadelphia 46, Pa.—Q  
Jewel Radio Corp., 900 Passaic Ave., E. Newark, N.J.—A,B,C,D,F,H,J,K  
Johnson Labs., Div. of Aladdin Industries, Norwalk, Conn.—L,M,N,O,Q  
Kaar Eng'g. Corp., 2995 Middlefield Rd., Palo Alto, Calif.—L,M,P  
Kane Electronics Corp., 81 Willoughby St., Brooklyn 1, N.Y.—G,H,J,K  
Kaye-Halbert Corp., 3623 Eastham Dr., Culver City, Calif.—J,K,L,M,O  
Kerney & Co., J. H., 2600 W. 50 St., Chicago 32, Ill.—A,J  
Kent TV, Inc., 505 Driggs Ave., Brooklyn 11, N.Y.—A,B,H,J,K  
Key Electronics Corp., 20 W. 22 St., New York 10, N.Y.—H  
Kingston Products Corp., 1412 N. Webster St., Kokomo, Ind.—B,P  
Kiteraft Products Co., 4507 Brunswick Ave., Los Angeles 39, Calif.—A  
La Pointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—Q  
Lavoie Labs. Inc., Morganville, N.J.—L,M,P  
Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—D,L,M  
Leonard Electric Products Co., 67 34 St., Brooklyn 32, N.Y.—I  
McGregor Electronics, McGregor, Iowa—D  
McLaughlin, J. L. A., La Jolla, Calif.—N,O  
Magna Electronics, Inc., 9810 Anza Blvd., Inglewood, Calif.—A,E  
MAGNAVOX CO., Fort Wayne 4, Ind.—H,J,K,L,M  
Majestic Radio & TV Corp., 385 4 Ave., New York 16, N.Y.—A,J

DO YOU  
KNOW THAT . . .

## THE 1953 ELECTRONIC INDUSTRIES DIRECTORY

contains  
the new, exclusive

# LOCALIZER INDEX

For the first time in a directory of this kind, a manufacturer can list his local representatives, his branch and regional offices, and his executive and regional personnel—right under his own alphabetical listing—right where 21,000 buying-minded engineers want to see it. Minimizes long-distance telephone and telegraph charges . . . cuts correspondence . . . increases inquiries . . . speeds services . . . gets new orders.

**TELE-TECH**  
& ELECTRONIC INDUSTRIES

Major Electronics Co., 1090 Bedford Ave., Brooklyn, N.Y.—A,B  
MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—O  
Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—B,J  
Masterpiece TV Mfg. Co., 735 Flatbush Ave., Brooklyn, N.Y.—J,K  
Mattison TV & Radio Corp., 10 W. 181 St., New York 53, N.Y.—I,J,L,Q  
Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—D,H  
MELPAR, 452 Swann Ave., Alexandria, Va.—L  
Microtran Co., Div. Crest Labs., 84-11 Rockaway Beach Blvd., Rockaway Beach 93, N.Y.—O  
Midwest Radio & TV Corp., 909 Broadway, Cincinnati 2, Ohio—B,J  
Mitchell Industries, Mineral Wells, Texas—D  
Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago 14, Ill.—A,B,J  
Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—A,B,C,D,N,O,P  
Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill.—A,B,C,D,G,H,J,K  
Multiple TV Mfg., 937 Hegeman Ave., Brooklyn, N.Y.—J  
MP Eng'g. Co., Fairfield 3, Conn.—B,G,J  
NATIONAL CO., 61 Sherman St., Malden 48, Mass.—J,L,M,Q  
National Electronics Labs. Inc., 1713 Kalorama Rd., N. W., Washington 9, D. C.—M  
National Electronics Mfg. Co., 314 W. 58 St., Los Angeles, Calif.—A,B,J,K  
Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.—A,B  
Oak Electronics, 144 Oak St., Buffalo 3, N.Y.—Q  
Olympic Radio & TV, Inc., 34-01 38 Ave., Long Island City 1, N.Y.—A B,D,G,H,J,K,L,M  
Orthon Corp., 196 Albion Ave. Paterson, N.J.—A,E,F  
Pacific Mercury TV Mfg. Corp., 5955 Van Nuys Blvd., Van Nuys, Calif.—A,B,D,G,H,J,K,L,M  
Packard-Bell Co., 12333 W. Olympic Blvd., W. Los Angeles, Calif.—A,H,J,K,L,M  
Peerless TV Radio Co., 6508 Euclid Ave., Cleveland, Ohio—A,B,J  
Pentron Corp., 221 E. Cullerton Ave., Chicago 16, Ill.—A,H,I  
PHILCO CORP., Tioga & C Sts., Philadelphia 34, Pa.—A,J  
Philharmonic Radio Co., 235 Jersey Ave., New Brunswick, N.J.—A,J  
Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—F  
Pilot Radio Corp., 37-06 36 St., Long Island City 1, N.Y.—B,D,G,H,I,J,K,L,M  
Plastics & Electronics Co., 272 Northland Ave., Buffalo 8, N.Y.—A,B  
POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—L,M  
Precision Electronics, 7518 Melrose Ave., Los Angeles 46, Calif.—A,B,G  
Prescott TV Co., 7350 Beverly Rd., Los Angeles 36, Calif.—J,K  
Progressive Electronics Co., 497 Union Ave., Brooklyn 11, N.Y.—F  
Radar-Electronics, Inc., 229 W. 28 St., New York 1, N.Y.—A,B,O  
Radiart Corp., 3455 Vega Ave., Cleveland 13, Ohio—Q  
Radio Apparatus Corp., 55 N. New Jersey St., Indianapolis, Ind.—M  
RADIO CORP. OF AMERICA, RCA VICTOR DIV., Front & Cooper Sts., Camden, N.J.—A,J  
Radio Craftsmen, 4401 N. Ravenswood Ave., Chicago 40, Ill.—B,J  
Radio Eng'g. Labs., 36-40 37 St., Long Island City 1, N.Y.—G,I  
Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill.—C  
Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—D,E,G,N  
Radio Mfg. Engineers 300 1 Ave., Peoria 6, Ill.—L,M,P,Q  
RADIO RECEPTOR CO., 84 N. 9 St., Brooklyn 11, N.Y.—L,M,O,P  
Radio & TV, Inc., Brunswick Div., 119 W. 57 St., New York 19, N.Y.—A,B,J,K,L,M  
Railway Communications, Raytown, Mo.—M  
Raytheon TV & Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill.—A,B,C,G,J,K,L,M  
Regal Electronics Corp., 605 W. 130 St., New York, N.Y.—A,J  
Remco Mfg. Co., 545 N. La Salle St., Chicago 10, Ill.—A  
Rex Electronics Corp., 1351 E. De Loss St., Indianapolis, Ind.—N,O,Q  
Roesch Co., D. J., 2200 S. Figuerola St., Los Angeles 7, Calif.—J,K  
Sargent-Raymont Co., 1401 Middle Harbor Rd., Oakland 20, Calif.—A,B  
Scott Radio Labs, Inc., 1020 N. Rush St., Chicago 11, Ill.—B,H,J,K  
Sentinel Radio Corp., Evanston, Ill.—A,J  
Setchell Carlson, Inc., 330 5 Ave., New Brighton, Minn.—A,J  
Shaw Television Corp., 195 Front St., Brooklyn 1, N.Y.—B,J,K  
Sheraton TV Corp., 370 7 Ave., New York 1, N.Y.—A,J  
Shevers, Inc., Harold, 123 W. 64 St., New York 23, N.Y.—A,B,C,G,H,J,K  
Shura-tone Products Inc., 440 Adelphi St., Brooklyn 38, N.Y.—H  
Sightmaster Corp., 111 Cedar St., New Rochelle, N.Y.—J

## ELECTRONIC INDUSTRIES DIRECTORY

Sonar Radio Corp., 3050 W. 21 St., Brooklyn 24, N.Y.—A,B,D,G  
Sonora Radio & TV Corp., 2023 W. Carroll St., Chicago, Ill.—A,J  
Spartan Radio Television, 2400 E. Ganson St., Jackson, Mich.—A,B,D,G,H,J,K,L,M,O  
Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—O  
Spera Electronic Labs., 37-10 33 St., Long Island City, N.Y.—L,M  
Starrett TV Corp., 601 W. 26 St., New York 1, N.Y.—J  
Steelman Phono & Radio Co., 12 Anderson Ave., Mount Vernon, N. Y.—A,B,D,F,G,I  
Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 51, Ill.—A,J  
Stromberg-Carlson Co., Rochester 3, N. Y.—B,H,J,K,M  
Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—B,G  
Sutton Electronic Co., 426 W. Short St., Lexington, Ky.—O,Q  
SYLVANIA ELECTRIC PRODUCTS, RADIO-TV DIV., 254 Rano St., Buffalo, N.Y.—A,C,D,J,K,L,M  
SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—A,C,D,J,K,L,M  
Tallen Co., 159 Carlton Ave., B'klyn, N.Y.—L,M  
Tech-Master Products Co., 443 Broadway, New York 13, N.Y.—A,F,J,L,M,Q  
TELECHROME INC., 88 Merrick Rd., Amityville, L.I., N.Y.—J  
Tele King Corp., 601 W. 26 St., New York, N.Y.—A,J  
Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—L,M  
Telequip Radio Co., 2559 W. 21 St., Chicago 8, Ill.—J  
Telex, 1633 Eustis, St. Paul 1, Minn.—D,E  
Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—F  
Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—N  
Trad Television, Asbury Park, N.J.—J  
Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—L,M  
Transvision, Inc., 460 North Ave., New Rochelle, N.Y.—J  
Trav-Ler Radio Corp., 571 W. Jackson Blvd., Chicago, Ill.—A,J  
Trebore Radio Co., Pasadena 18, Calif.—A  
Trutone Electronic Eng'g. Co., 812 N. Highland Ave., Los Angeles 38, Calif.—A,D,E,G,H  
TURNER CO., 909 17 St., N. E., Cedar Rapids, Iowa—N,O  
United Pressed Products Co., 741 Harrison St., Chicago 7, Ill.—Q  
Universal Major Appliances, Lima, Ohio—J  
VECTRON, INC., 400 Main St., Waltham 54, Mass.—L  
Vidaire Electronics Mfg., 576 W. Merrick Rd., Lynbrook, L.I., N.Y.—J  
Video Products Corp., 42 West St., Red Bank, N.J.—L,M,O  
Videon Electronic Corp., 222 E. Ohio St., Indianapolis 4, Ind.—O,Q  
Warwick Mfg. Corp., 4640 W. Harrison St., Chicago 44, Ill.—A,J  
Wells-Gardner & Co., 2701 N. Kildare Ave., Chicago, Ill.—A,J  
West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—D,M

Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—A,C,D,F,N,O,Q  
WESTINGHOUSE ELECTRIC CORP., TELEVISION-RADIO DIV., Sunbury, Pa. A,J  
White Industries, Inc., 421 W. 54 St., New York 19, N.Y.—L,M  
White Rock Mfg. Co., White Rock, S.C.—A,H  
Zenith Radio Corp., 6001 Dickens Ave., Chicago 39 Ill.—A,J

## 71—RECEIVERS—NAVIGATION & SPECIAL PURPOSE

### Navigation

Receivers, direction finding ..... A  
Receivers, fixed frequency ..... B  
Receivers, loran ..... C  
Receivers, VHF omnirange ..... D

### Special Purpose

Receivers, automatic alarm ..... E  
Receivers, facsimile ..... F  
Receivers, panoramic ..... G

Air Associates Inc., 511 Joyce St., Orange, N.J.—A,B,C,D,F  
AIRCRAFT RADIO CORP., P. O. Box 150, Boonton, N.J.—A,D  
Aeronautical Radio Mfg. Co., 155 1 St., Mineola, L.I., N.Y.—C,D  
American Electroneering Corp., 2040 Colorado Ave., Santa Monica, Calif.—A,B  
Ansley Electronics, Inc., 85 Tremont St., Meriden, Conn.—A  
Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.—A  
Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—F  
Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—B  
Bassett Inc., Rcx, 1314 N. E. 17 Court, Ft. Lauderdale, Fla.—B  
Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—E,G  
Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—D  
Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—B  
Calbest Eng'g. & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—B  
Canoga Corp., 5955 Sepulveda Blvd., Van Nuys, Calif.—B  
CBS-Columbia, Inc., 170 53 St., Brooklyn 32, N.Y.—A  
C.G.S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—A,B,G  
Communication Devices Co., 2331 12 Ave., New York 27, N.Y.—A,C  
Communications Co., 300 Greco Ave., Coral Gables, Fla.—B  
Conn. Telephone & Elec. Co., 70 Britannia St., Meriden, Conn.—E  
Dollar Co., Robert, Communications Equip. Div., 50 Drumm St., San Francisco, Calif.—B  
Eldico of N.Y., Inc., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—B  
Electron Enterprises, 6917 W. Stanley Ave., Berwyn, Ill.—B  
Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—B  
El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—B  
Eng'g. Associates, 434 Patterson Rd., Dayton 9, Ohio—A  
Erco Radio Labs., Stewart Ave., Garden City, N.Y.—B  
Esvey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D,E,F,G  
FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—A  
Federal Telecommunication Labs., 500 Washington Place, Nutley N.J.—A  
FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—C  
Fisher Research Lab., 1961 University Ave., Palo Alto, Calif.—A  
Freed Electronics & Control Corp., 200 Hudson St., New York 13, N.Y.—A,B,C,D  
Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—E  
Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—B  
Gavco Corp., 540 E. 80 St., New York, N.Y.—A  
GENERAL ELECTRIC CO., RADIO-TV DEPT., ELECTRONICS PART, Syracuse, N.Y.—C,E  
Gibbs Mfg. & Research Corp., 450 N. Main St., Janesville, Wisc.—G  
G & M Equip. Co., 7315 Varna Ave., N. Hollywood, Calif.—C  
Hogan Labs., 155 Perry, New York 14, N.Y.—F  
Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—B  
Int'l. Research Corp., 2221 Warwick Ave., Santa Monica, Calif.—B  
Kaar Eng'g. Corp., 2995 Middlefield Rd., Palo Alto, Calif.—A,B  
Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—A,B,D,E  
Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A

## EXCLUSIVE LIST of ELECTRONIC REPRESENTATIVES

This is the only list in any directory devoted exclusively to electronic representatives. Arranged alphabetically according to states and cities, it gives the names and addresses of all independent "reps" throughout the country. It is the most complete and authoritative representatives list ever published. See page 308.

**TELE-TECH**  
& ELECTRONIC INDUSTRIES

Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—A  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—E  
 Mitchell Industries, Mineral Wells, Texas—D  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—B  
 Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill.—B  
 National Aeronautical Corp., 180 S. Main St., Ambler, Pa.—D  
 NATIONAL CO.—Malden 48, Mass.—B  
 Panoramic Radio Products, 10 S. 2 Ave., Mt. Vernon, N.Y.—G  
 PHILCO CORP., GOV'T. & INDUSTRIAL DIV., 4700 Wissahickon Ave., Philadelphia 44, Pa.—C  
 Post Machinery Co., 140 Elliott St., Beverly, Mass.—E  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—A,F  
 Radio Apparatus Corp., 55 N. New Jersey St., Indianapolis Ind.—B  
 RAYTHEON MFG. CO., Waltham 54, Mass.—A  
 Raytheon TV & Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill.—A  
 Remco Mfg. Co., 545 N. La Salle St., Chicago 10, Ill.—A  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—A,B,C  
 Seismograph Service Corp., P. O. Box 1590, Tulsa, Okla.—C  
 Sonar Radio, 3050 W. 21 St., B'klyn, N.Y.—E  
 Specific Products, 5864 Hollywood Blvd., Hollywood 28, Calif.—B  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,D  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—A,B,C  
 Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—F  
 Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—B  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—A,B,C  
 Univex Corp., 102 Warren St., New York 7, N.Y.—D  
 VECTRON, 400 Main St., Waltham 54, Mass.—G  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—B  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—B  
 Westrex, 111 8 Ave., New York, N.Y.—B,F  
 White & Sons, Inc., Wilfred O., 178 Atlantic Ave., Boston 10, Mass.—A

## 72—RECORDERS, AUDIO

**Recorders, dictation** ..... J  
**Recorders, disc** ..... K  
**Recorders, magnetic film stripe** . . . A  
**Recorders, magnetic tape** ..... B  
**Recorders, magnetic wire** ..... C  
**Recorders, photographic film sound track** ..... D  
**Recorders, portable** ..... E  
**Recorders, sound** ..... F  
**Recorders, studio** ..... G  
**Recorders, synchronized film-tape** . H  
**Recorders, telephone** ..... I

AMPEX ELECTRIC CORP., 934 Charter St., Redwood City, Calif.—B,C,H  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—C,K  
 AUDIO DEVICES, INC., 444 Madison Ave., York 22, N.Y.—A,B  
 Audio Industries, Inc., 532 W. 4 St., Michigan City, Ind.—E,K  
 Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—F  
 Audio Master Corp., 341 Madison Ave., New York 17, N.Y.—B,J  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—A,B,D,F,G,H,I,J  
 Aurex, 1117 N. Franklin, Chicago 10, Ill.—C  
 Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7 Ohio—B,E  
 Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.—B  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—D  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,F  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—E  
 Broadcast Equip. Specialties, 135-01 Liberty Ave., Richmond Hill, L.I., N.Y.—B,E  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—B,E,F  
 Bunnell & Co., J.H., 81 Prospect St., Brooklyn 1, N.Y.—B  
 Calvin Co., 1105 Truman Rd., Kansas City 6, Mo.—B  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—A,D,G,H  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—I  
 Cook Laboratories, Inc., 114 Manhattan St., Stamford, Conn.—K  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—B,E

Crescent Industries, Inc., 5900 W. Touhy Ave., Chicago 31, Ill.—E,J  
 Crosby Enterprises, Inc., Bing, 9030 Sunset Blvd., Los Angeles 46, Calif.—B,D  
 Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md.—B  
 Daystrom Electric Corp., 837 Main St., Poughkeepsie, N.Y.—B  
 DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—E  
 DuKane Corp., St. Charles, Ill.—B  
 Ectro, 425 S. Sandusky, Delaware, Ohio—B,E  
 Edin Co., 207 Main St., Worcester 8, Mass.—E  
 Eicor, 1501 W. Congress, Chicago 7, Ill.—B  
 Electro Craft Inc., 68 Jackson St., Stamford, Conn.—E  
 Electrosonic Specialties, 7230 Clinton Rd., Upper Darby, Pa.—G  
 Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.—H  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7 Ave., Whitestone, N.Y.—A,D,E,G,H,K  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,B,C,E,F,H,J  
 Garod Radio, 70 Washington St., B'klyn, N.Y.—J  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—G,K  
 General Cement Mfg. Co., 19 Taylor Ave., Rockford, Ill.—B,C  
 GENERAL INDUSTRIES, Olive & Taylor Sts., Elyria, Ohio.—K  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—F  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—A,E,H  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—B  
 Heiland Research Corp., 130 E. 5 Ave., Denver 9, Colo.—E  
 Kinevox, 116 S. Hollywood W., Burbank, Calif.—H  
 Korb Eng'g. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—A  
 Land-Air, Inc., 440 W. Superior St., Chicago, Ill.—B,C  
 Macon Electronics, Merchant St., Warrensburg, Ill.—B  
 Magnasynne Mfg. Co., 5517 Satsuma Ave., N. Hollywood, Calif.—A,E,H  
 Magnecord, Inc., 225 W. Ohio St., Chicago 10, Ill.—B,E,G  
 Magne-Pulse Corp., 140 Nassau St., New York 38, N.Y.—B,I  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—B,C,H,I,J  
 Michigan Electronics, Inc., 854 N. Rockwell St., Chicago 22, Ill.—J  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—E,I,J  
 Packard-Bell Co., 12333 W. Olympic Blvd., W. Los Angeles, Calif.—K  
 Pentron Corp., 221 Ecollerton Ave., Chicago 16, Ill.—B,C,J  
 Permo, Inc., 6415 N. Ravenswood Ave., Chicago 26, Ill.—B,C  
 Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—I,J  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—B  
 Premier Electronic Labs., 382 Lafayette St., New York 3, N.Y.—B  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—F  
 PRESTO RECORDING CO., P. O. Box 500, Paramus, N.J.—B,E,G,K  
 Product Associates, 318 W. Olympic Blvd., Los Angeles 15, Calif.—B,J  
 RCA Radio Recorders, 700 Santa Monica Blvd., Hollywood 38, Calif.—E,H  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—A,B,E,H  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—E,F,D,G,H  
 Rek-O-Kut Co., 38-01 Queens Blvd., Long Island City 1, N.Y.—K  
 Robinson Recording Labs., 35 S. 9 St., Philadelphia 7, Pa.—G  
 Scully Machine Co., 62 Walter St., Bridgeport 3, Conn.—K  
 Simpson Mfg., Mark, 32-28 49 St., Long Island City 3, N.Y.—K  
 Smith Associates, Rawdon, 2217 M St., N. W., Washington 1, D.C.—B  
 S.O.S. Cinema Supply Corp., 602 W. 52 St., New York 19, N.Y.—D,H  
 Sound Apparatus, Stirling, N.J.—F  
 Soundscribe Corp., 146 Munson St., New Haven 4, Conn.—E  
 Speak-O-Phone Recording & Equip. Co., 23 W. 60 St., New York, N.Y.—B,K  
 Stencil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—A,B,E,G,H,I,J  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—F  
 Streeter-Amet Co., 4101 Ravenswood Ave., Chicago 13, Ill.—E  
 Symphony Radio-TV Corp., 825 W. Pico Blvd., Los Angeles 15, Calif.—K  
 Techno Instrument Co., 6666 Lexington Ave., Los Angeles 38, Calif.—B  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—E,F,I  
 Thompson Clock Co., Bristol, Conn.—F  
 United Pressed Products Co., 741 W. Harrison St., Chicago 7, Ill.—B

U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—B,E,G  
 Wagner Research, 1420 E. Elizabeth Ave., Linden, N.J.—K  
 Westrex Corp., 111 8 Ave., New York 11, N.Y.—B,G,H  
 Wilcox-Gay Corp., 604 W. Seminary St., Charlotte, Mich.—K  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—A,E

## 73—RECORDERS—SPECIAL PURPOSE

**Memory Drums** ..... R  
**Recorders, code** ..... A  
**Recorders, facsimile** ..... B  
**Recorders, film** ..... C  
**Recorders, film thickness** ..... D  
**Recorders, fluid flow** ..... E  
**Recorders, frequency** ..... F  
**Recorders, graphic** ..... G  
**Recorders, machine assemblies** . . . H  
**Recorders, portable** ..... I  
**Recorders, power level** ..... J  
**Recorders, strain** ..... K  
**Recorders, telemetering** ..... L  
**Recorders, teletype** ..... M  
**Recorders, temperature** ..... N  
**Recorders, timing** ..... O  
**Recorders, torque** ..... P  
**Recorders, vacuum** ..... Q

Airborne Instruments Lab., 160 Old Country Rd., Mineola, L.I., N.Y.—G  
 Alden Electronic & Impulse Recording, P.O. Box 125, Westboro, Mass.—B,G,O  
 Alfax Paper & Eng'g. Co., P.O. Box 125, Westboro, Mass.—B,G,O  
 Arkav, 605 1st Ave., S.W., Rochester, Minn.—A  
 AUDIO DEVICES, INC., 444 Madison Ave., New York 22, N.Y.—Q  
 Audio Industries, Inc., 532 W. 4th St., Michigan City, Ind.—I  
 Audio Instrument Co., 133 W. 14th St., New York 11, N.Y.—J  
 Audio-Tone Oscillator Co., 6511 Main St., Long Hill, Conn.—G  
 Audio & Video Products Corp., 730 5th Ave., New York 19, N.Y.—A,B,F,G,I,K,L,M,R  
 Aurex Corp., 1117 N. Franklin St., Chicago 10, Ill.—  
 Bailey Meter Co. 1050 Ivanhoe Rd., Cleveland, 10, Ohio—E,L,N,Q  
 Baldwin-Lima-Hamilton, Phila. 42, Pa.—K,P  
 Bell Sound Systems, 555 Marion Rd., Columbus 7, Ohio—I  
 Benson-Lehner Corp., 2340 Sawtelle Blvd., Los Angeles 64, Calif.—G  
 BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, 2200 Wright Ave., Richmond, Calif.—F,O  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—C  
 Boehme, Inc., H. O., 915 Broadway, New York 10, N.Y.—A  
 Bristol Co., Waterbury 20, Conn.—E,G,J,L,N,O,Q  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—F,J,K,L  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—I  
 Broadcast Equip. Specialties, 135-01 Liberty Ave., Richmond Hill, L.I., N.Y.—I  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—I,G,R  
 Bunnell & Co., 81 Prospect St., Brooklyn 1, N.Y.—B,M  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—C  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles, Calif.—C,K,L,N,O,P  
 Consolidated Vacuum Corp., 735 Ridge Rd. W., Rochester 3, N.Y.—Q  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—I  
 Crescent Industries, Inc., 5900 W. Touhy Ave., Chicago 31, Ill.—H,I  
 Dale Products Inc., 1300 28 Ave., Columbus, Nebr.—C  
 Davies Labs, Inc., 4705 Queensbury Rd., Riverdale, Md.—L  
 Daystrom Electric Corp., 837 Main St., Poughkeepsie, N.Y.—C  
 DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—I  
 Ectro Inc., 425 S. Sandusky St., Delaware, Ohio.—I  
 Edin Co., 207 Main St. Worcester 8, Mass.—G,I,J,K,N,O  
 Electro Craft, 68 Jackson, Stamford, Conn.—I  
 Electronic Associates, Long Branch, N.J.—G  
 Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—K  
 Eng'g. Research Associates, Div. Remington Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—R  
 Esterline-Angus Co., P.O. Box 596, Indianapolis 6, Ind.—F,G,L,Q  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7 Ave., Whitestone, N.Y.—B,I,L

Feller Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—C,I  
 Fischer & Porter, 19 Warminster Rd., Hatboro, Pa.—E,L,N  
 Foxboro Co., 28 Neponset Ave., Foxboro, Mass.—E,K,N  
 Gale Mechanisms, Dorothea, 81-01 Broadway, Elmhurst, L.I., N.Y.—O  
 General Communications, P.O. Box 169, Fort Atkinson, Wis.—R  
 GENERAL ELECTRIC CO., APPARATUS DIV., 1 River Rd., Schenectady 5, N.Y.—G,K,L  
 Gorrell & Gorrell, Haworth, N.J.—G,O,R  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—C,I  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—B  
 Heiland Research Corp., 130 E. 5th Ave., Denver 9, Colo.—G,I,K  
 Hogan Labs., Inc., 155 Perry St., New York 14, N.Y.—B  
 Impact-O-Graph Corp., 1900 Euclid Ave., Cleveland 15, Ohio—G  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—R  
 Leeds & Northrup, 4901 Stenton Ave., Philadelphia 44, Pa.—G  
 Logistics Research, Inc., 141 S. Pacific Ave., Redondo Beach, Calif.—G,R  
 Lovine Eng'g. Co., 8203 Cedar St., Silver Springs, Md.—C  
 Magnasyn Mfg. Co., 5517 Satsuma Ave., N. Hollywood, Calif.—C,I,L  
 Magnecord Inc., 225 W. Ohio St., Chicago 10, Ill.—I  
 Magne-Pulse Corp., 140 Nassau St., New York 38, N.Y.—L,R  
 Mfrs. Eng'g. & Equip. Corp., York & Mill Rds., Hatboro, Pa.  
 Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—L  
 Maurer Inc., J. A., 37-01 31st St., Long Island City 1, L.I.—C  
 Medcraft Electronic Corp., 41-41 24 St., Long Island City 1, N.Y.—G  
 Metrotype Corp., 525 W. 76 St., Chicago 20, Ill.—E,F,K,L,M,N,P,Q  
 Midwestern Geophysical Lab. 3401 S. Harvard, Tulsa, Okla.—I,L  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—C,I,M  
 Minn.-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.—F,G,N,Q  
 Nosker Eng'g. Products, 1216 Livermore St., Yellow Springs, Ohio.—K  
 Penn Industrial Instrument Corp., 4110 Haverford Ave., Phila. 4, Pa.—E,L,N  
 Pereny Equip. Co., 893 Chambers Rd., Columbus 12, Ohio.—N  
 Phila. Scientific Glass Co., 4 Eckhard Ave., Abington, Penna.—N  
 Polyphase Instrument Co., 705 Haverford Rd., Bryn Mawr, Pa.—K,P  
 Potter Instrument Co., 115 Cutter Mill Rd., Great Neck, N.Y.—F,L,O  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—G  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—B  
 PRESTO RECORDING CO., P.O. Box 500, Paramus, N.J.—I  
 Pyrometer Instrument Co., 92 Portland Ave., Bergenfield, N.J.—N  
 Radio Recorders 7000 Santa Monica Blvd., Hollywood 38, Calif.—F,I  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—I  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—C,H,I  
 Robinson Recording Labs., 35 S. 9 St., Philadelphia 7, Pa.—H  
 Ruge-deForest Inc., 84 Mass. Ave., Cambridge, 39, Mass.—K,P,Q  
 Servomechanisms, Inc., Post & Stewart Aves., Westbury, L.I., N.Y.—L  
 Sound Apparatus Co., Stirling, N.J.—J  
 SoundScriber Corp., 146 Munson St., New Haven 4, Conn.—I  
 Special Instruments Lab., 1003 Highland Ave., Knoxville, Tenn.—O  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—C,I,L  
 Streeter-Amet Co., 4101 Ravenswood Ave., Chicago 13, Ill.—G,I,L,N,P,Q  
 Tally Register Corp., 5300 14 Ave., N.W., Seattle 7, Wash.—A  
 Talking Devices Co., 4447 Irving Park Rd., Chicago 41, Ill.—C,H  
 Techno Instrument Co., 6666 Lexington Ave., Los Angeles 38, Calif.—C,G,J,K  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—A,H,I  
 Telecomputing Corp., Burbank, Calif.—G,L  
 Teleregister Corp., 157 Chambers, New York 7, N.Y.—R  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—O  
 Tigrman Eng'g. Co., 4332 N. Western Ave., Chicago 18, Ill.—L  
 Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—B  
 Tracerlabs, Inc., 130 High St., Boston 10, Mass.—D  
 U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—I  
 Westrex Corp., 111 Eighth Ave., New York 11, N.Y.—C  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—C,I



## 74—RECORDING ACCESSORIES

**Discs, blank** ..... A  
**Drivers** ..... B  
**Equalizers** ..... C  
**Heads, cutting** ..... D  
**Heads, recording** ..... E  
**Needles, cutting** ..... F  
**Record molding compounds** ..... G  
**Record preforms** ..... H  
**Recording paper** ..... I  
**Screw feeds** ..... J  
**Stylus, rotary** ..... K  
**Tape, magnetic** ..... L  
**Tape splicers** ..... M  
**Turntables** ..... N  
**Wire, magnetic** ..... O

Advance Recording Products Co., 36-12 34 St., Long Island City, N.Y.—A  
 Alfax Paper & Eng'g. Co., P.O. Box 125 Westboro, Mass.—I  
 AMPEX ELECTRIC CORP., 934 Charter St., Redwood City, Calif.—L  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—L  
 Ampro Corp., 2835 N. Western Ave., Chicago 18, Ill.—L  
 Arkay, 605 1 Ave., S. W., Rochester, Minn.—I  
 Audak Co., 500 5 Ave., New York 36, N.Y.—D,E  
 AUDIO DEVICES INC. 444 Madison Ave., New York 22, N.Y.—A,F,L  
 Audio Master Corp., 341 Madison Ave., New York 17, N.Y.—L,N  
 Audio & Video Products Corp., 730 5th Ave., New York 19, N.Y.—A,C,D,E,F,K,L,M,N,O  
 AVERY ADHESIVE LABEL CORP., 1616 S. California Ave., Monrovia, Calif.—M  
 Bell Sound Systems 555 Marion Rd., Columbus 7, Ohio—L  
 Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.—E,L  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—C,F  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—L  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—D,E  
 Burnell & Co., 45 Warburton Ave., Yonkers, N.Y.—C  
 Caltron Products Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.—A,F  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—L,M  
 CBS—Columbia Inc., 170 53 St., Brooklyn 32, N.Y.—L,O  
 CINEMA ENG'G. CO., DIV. AERVOX CORP., 1510 W. Verdugo Ave., Burbank, Calif.—C  
 Communication Accessories Co., Hickman Mills, Mo.—C  
 Cook Labs., Route 2, Stamford, Conn.—B,D  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,B,C,D,E,F,J,M,N  
 Crescent Industries, 5900 W. Touhy Ave., Chicago 31, Ill.—E,L,N,O  
 Daven Co., 191 Central Ave., Newark, N.J.—C  
 Davies Labs., Inc., 4705 Queensbury Rd., Riverdale, Md.—L  
 Daystrom Electric Corp., 837 Main St., Poughkeepsie, N.Y.—L  
 Electro, Inc., 425 S. Sandusky St., Delaware, Ohio—L  
 Edin Co., 207 Main St., Worcester 8, Mass.—I  
 Eicor, 1501 W. Congress, Chicago 7, Ill.—E  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—C  
 Electrosonic Specialties, 7230 Clinton Rd., Upper Darby, Pa.—L,O  
 Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.—L  
 Eng'g. Research Associates, Div. Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—E  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7th Ave., Whitestone, N.Y.—C,D,E,F,L,N  
 Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—L  
 Federal Sapphire Products, 12 River Rd., Fair Lawn, N.J.—F  
 Ferrocube Corp. of America, 35 Marshall St., N. Adams, Mass.—E  
 Frutchev, M., Box 28, Hackettstown, N.J.—E  
 Gale Dorothea Mechanisms, 81-01 Broadway Elmhurst, L.I., N.Y.—L,N  
 Garod Radio Corp., 70 Washington St., Brooklyn 1, N.Y.—L  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—F,L,O  
 GENERAL INDUSTRIES CO., Olive & Taylor Sts., Elyria, Ohio—L,N

GRAY RESEARCH & DEVEL. CO., 658 Hilliard St., Manchester, Conn.—C  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—C,E,L  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—L  
 Hogan Labs. Inc., 155 Perry St., New York 14, N.Y.—I  
 Home Recording Products Corp., 56 Mill Rd., Freeport, N.Y.—A  
 Hycor Co., 11423 Vanowen St., N. Hollywood, Calif.—C  
 Jensen Industries, 329 S. Wood St., Chicago, 12, Ill.—F,L  
 Kinevox Inc., 116 S. Hollywood Way, Burbank, Calif.—M  
 Korb Eng'g. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—L,O  
 Land-Air, Inc., 440 W. Superior St., Chicago 10, Ill.—E  
 Lipps Co., Edwin A., 5485 W. Washington Blvd., Los Angeles 16, Calif.—D,E,F  
 Life Record Co., 64 W. Randolph St., Chicago, Ill.—A  
 Magna Electronics Inc., 9810 Anza Blvd., Inglewood, Calif.—C  
 Magnasyn Mfg. Co., 5517 Satsuma Ave., N. Hollywood, Calif.—K,E,M  
 Magnecessories, Box 6960, Washington 20, D.C.—L,M  
 Magnecord Inc., 225 W. Ohio St., Chicago 10, Ill.—E,L  
 Magne-Pulse Corp., 140 Nassau St., New York, 38, N.Y.—L  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—E,I,L,O  
 Maurer, Inc., J. A., 37-01 31 St., Long Island City 1, N.Y.—M  
 Mederaft Electronic Corp., 41-41 24 St., Long Island City 1, N.Y.—I  
 Merix Chemical Co., 1021 E. 55 St., Chicago 15, Ill.—G  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—D,E,F  
 Miller Mfg. Co., M. A., Libertyville, Ill.—F  
 Minn. Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.—L  
 Monson Corp., 919 N. Michigan Ave., Chicago, 11, Ill.—L  
 Orradio Industries, T-120 Marvyn Rd., Opelika, Ala.—L  
 Pacific Transducer Corp., 11921 W. Pico Blvd., Los Angeles 64, Calif.—C  
 Peirce Wire Recorder Corp., 1328 Sherman Ave., Evanston, Ill.—E,L,O  
 Pentron Corp., 221 E. Cullerton Ave., Chicago 13, Ill.—E,I,L  
 Permo, Inc., 6415 N. Ravenswood Ave., Chicago 26, Ill.—F,L,O  
 Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—L  
 Pickering & Co., 309 Woods Ave., Oceanside, N.Y.—C,O  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—I  
 Precision Supply & Machine Co., 12-36 River Rd., Fair Lawn, N.J.—F  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—L  
 PRESTO RECORDING CO., P.O. Box 500, Paramus, N.J.—A,C,D,E,F,L,N  
 Prestoseal Mfg. Co., 37-27 33 St., Long Island City 1, N.Y.—M  
 RADIO CORP. OF AMERICA—RCA VICTOR DIV., Front & Cooper St., Camden 2, N.J.—D,E,L,N  
 Radio Music Corp., 84 S. Water St., Port Chester, N.Y.—C,D,E,N  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—A,L  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—E,L  
 Recoton Corp., 147 W. 22 St., New York 11, N.Y.—A,F,L  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—B,C  
 REEVES SOUNDCRAFT CORP., 10 E. 52 St., New York 22, N.Y.—A,B,F,I,L  
 Rek-O-Kut Co., 38-01 Queens Blvd., Long Island City 1, N.Y.—D,N  
 Robinson Recording Labs., 35 S. 9 St., Philadelphia 7 Pa.—N  
 Schaevitz Eng'g., Crescent Blvd. & Drexel Ave., Camden 1, N.J.—I  
 Shoup Eng'g. Co., 221 E. Cullerton St., Chicago 16, Ill.—E,L  
 SHURE BROS., 225 W. Huron St., Chicago 10, Ill.—E  
 Simpson Mfg. Co., Mark, 32-38 49 St., Long Island City 3, N.Y.—L  
 Smith Associates, Rawdon, 2217 M St., N.W., Washington 1, D.C.—C,E  
 Sonar Radio Corp., 3050 W. 21 St., Brooklyn 24, N.Y.—L  
 Sonic Recording Products, 58 Mill Rd., Freeport, L.I., N.Y.—A,F  
 S.O.S. Cinema Supply Corp., 602 W. 52 St., New York 19, N.Y.—M  
 SoundScriber Corp., 146 Munson St., New Haven 4, Conn.—A,L  
 Speak-O-Phone Recording & Equip. Co., 23 W. 60 St., New York, N.Y.—A,F,L  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—E,L  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—C,N  
 Strandberg Eng'g. Labs., 416 W. Market St., Greensboro, N.C.—F  
 Talking Devices Co., 4447 Irving Park Rd., Chicago 41, Ill.—B,D,E

Techno Instrument Co., 6666 Lexington Ave., Los Angeles 38, Calif.—L  
Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—L,O  
Thompson Clock Co., H. C. 38 Federal St., Bristol, Conn.—E,N  
Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—I  
United Pressed Products Co., 741 W. Harrison St., Chicago 7, Ill.—E  
United Transformer Co., 150 Varick St., New York 13, N.Y.—C  
Univex Corp., 102 Warren St., New York 7, N.Y.—L  
U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—A,C,D,E,F,L,M,N  
Valentine Inc., Thomas J., 150 W. 46 St., New York 36 N.Y.—A,G,L  
Webster-Chicago Corp., 5610 W. Bloomingdale Ave., Chicago 39, Ill.—L,O  
Webster Electric Co., 1900 Clark St., Racine, Wisc.—L  
Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—L  
Westrex Corp., 111 Eighth Ave., New York 11, N.Y.—B,D  
Williams & Co., C. K., 640 N. 13 St., Easton, Pa.—L  
Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—L,O

## 75—RECTIFIERS & VIBRATORS

**Battery eliminators** ..... A  
**Inverters** ..... B  
**Power plants** ..... C  
**Rectifier power units** ..... D  
**Rectifiers, electronic tube** ..... E  
**Rectifiers, hand-cranked** ..... F  
**Rectifiers, mercury arc** ..... G  
**Rectifiers, metallic** ..... H  
**Rectifiers, metal oxide** ..... I  
**Regulators, voltage** ..... J  
**Vibrators & Frequency Changers** . . K

Acme Electric Corp., Water St., Cuba, N.Y.—D,H  
Acme Electronics Inc., 300 N. Lake Ave., Pasadena 4, Calif.—A,D,J  
Accurate Eng'g. Co., 2005 Blue Island Ave., Chicago 8, Ill.—D,E,G,H  
Aeronautical Radio Mfg. Co., 155 1 St., Mineola, L.I., N.Y.—B,K  
Airepax Products Co., P.O. Box 137, Baltimore 20, Md.—A,B,C,D,H,I,J,K  
ALCO ELECTRONICS MFG. CO., 102 Marston St., Lawrence, Mass.—D  
Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.—E,J  
American Communications Corp., 306 Broadway, New York 7, N.Y.—D,E  
American TV & Radio Co., 300 E. 4 St., St. Paul 1, Minn.—A,B,C,D,H,K  
Anton Electronic Labs., 126 T Flushing Ave., Brooklyn 37, N.Y.—J  
Applegate & Co., C. J., 1816 Grove St., Boulder Colo.—D,J  
Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—D,E,I  
Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—H  
BENDIX AVIATION CORP., Red Bank, Div., Eatontown, N.J.—B  
Beta Electric Corp., 333 E. 103 St., New York 29, N.Y.—D  
Bogen Co., 29 9 Ave., New York, N.Y.—J  
Bogue Electric Mfg. Co., 52 Iowa Ave., Patterson 3, N.J.—D,H  
Bradley Labs., 168 Columbus Ave., New Haven 11, Conn.—H,I  
Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—C,D,E,G,H,I,K  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—B,K  
Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—A,B,D  
CARTER MOTOR CO., 2644 N. Maplewood Ave., Chicago 47, Ill.—B  
Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—A,D,H  
Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—E,J  
Communication Devices Co., 2331 12 Ave., New York City 27, N.Y.—B,D,K  
Communication Measurements Lab., 350 Leonard Ave., Plainfield, N.J.—E  
Conant Labs., 6500 "O" St., Lincoln 5, Nebr.—H,I  
Condenser Products Co., 7517 N. Clark St., Chicago 26, Ill.—C,D,E  
Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—A,B,D,K  
Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—A,B,C,D,K  
Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—E  
Delco-Remy Div. General Motors Corp., P O Box 640, Anderson, Ind.—J  
DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—D  
Dresser Electric Co., 942 E. Larned St., Detroit 7, Mich.—A,D  
DX RADIO PRODUCTS CO., 2300 W. Armitage Ave., Chicago 47, Ill.—A  
Eastgap Co., 285 Columbus Ave., Boston 16, Mass.—D

Eicor, 1501 W. Congress, Chicago 7, Ill.—B  
Electric Regulator Corp., Pearl St., Norwalk, Conn.—J  
Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.—K  
Electronic Measurements Co., Lewis St. & Maple Ave., Eatontown, N.J.—E  
Electronic Rectifier Co., 1462 E. Main St., Rochester 2, N.Y.—D,H  
ELECTRO PRODUCTS LAB. INC., 4501 N. Ravenswood Ave., Chicago, Ill.—A,D  
Electro-Tech Equip. Co., 308 Canal St., New York N.Y.—A,B,D,H,I,J  
Electrotech Corp., 15601 Arrow Hwy., Azusa, Calif.—E  
Eng'g. Research & Development Co., Addison, Ill.—E,I  
Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A,E,H  
Espey Mfg., 528 E. 78 St., New York, N.Y.—D  
Fansteel Metallurgical Corp., 2200 Sheridan Rd., Chicago, Ill.—D,H  
FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton N.J.—A,C,D,G,J  
Ferranti Electric, Inc., 30 Rockefeller Plaza, New York 20, N.Y.—J  
Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—C,E  
FREED TRANSFORMER CO., 1726 Weirfield St., Brooklyn 27, N.Y.—D  
Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—A,D,E,H  
Galbraith & Son Electric Corp., 450 Ave. of the Americas, New York 11, N.Y.—D  
Galvanic Products Corp., 110 E. Hawthorne Ave., Valley Stream, N.Y.—A,D,H  
GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—E,J  
Gavco Corp., 540 E. 80 St., New York, N.Y.—J  
General Communications, P O Box 169, Fort Atkinson Wisc.—D,J  
GENERAL ELECTRIC CO., Electronics Park, Syracuse, New York.—H,J,K  
GENERAL ELECTRIC CO., Tube Dept., 1 River Rd., Schenectady 5, N.Y.—E,G,K,AA  
GENERAL ELECTRIC CO., APPARATUS DIV., 1 River Rd., Schenectady 5, N.Y.—B,E,H,I,J,K  
General Electronics Inc., 32 W. 22 St., New York 10, N.Y.—D,E  
General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y.—D  
General Magnetics, 135 Bloomfield Ave., Bloomfield N.J.—J,K  
Globe Industries, 125 Sunrise Pl., Dayton, 7, Ohio.—K  
Green Electric Co., W., 130 Cedar St., New York 6, N.Y.—D  
GULTON MFG. CORP., 212 Durham Ave., Metuchen, N.J.—K  
Hansen Co., William, 165 Silverbrook Ave., Niles, Mich.—B  
Hanson-Gorrill-Brian, 1 Continental Hill, Glen Cove, N.J.—D,J  
Heyer Products Co., 471 Cortlandt St., Belleville 9, N.J.—A,D  
Hull & Co., R. O., 1300 Parsons Ct., Rocky River, Ohio.—D  
Industrial Electronics, Inc., 8060 Wheeler St., Detroit 10, Mich.—D  
Industrial Transformer, Gouldsboro, Pa.—J  
Inet, Inc., 866 S. Main St., Los Angeles 3, Calif.—A,D,F,H,I  
INTERNATIONAL RECTIFIER CORP., 1521 E. Grand Ave., El Segundo, Calif.—H,I  
International Resistance Co., 401 N. Broad St., Philadelphia 8, Pa.—H  
I-T-E Circuit Breaker Co., 19th & Hamilton Sts., Philadelphia 30, Pa.—F  
James Vibrapow Co., 4036 N. Rockwell St., Chicago 18, Ill.—C,K  
Jersey City Tech. Labs., 880 Bergen Ave., Jersey City 6, N.J.—I  
Jobbins Electronic Enterprises, 1358 Hollyburne Ave., Menlo Park, Calif.—D  
Kalbfell Labs., 1090 Morena Blvd., San Diego, 10, Calif.—J  
KELLOGG SWITCHBOARD & SUPPLY, 79 W. Monroe St., Chicago 3, Ill.—E,I,K  
Kemtron Electron Products, 23 Brown St., Salem, Mass.—E  
Kepco Labs., 131-38 Sanford Ave., Flushing 55 N.Y.—A,D,E,J  
Kinevox Inc., 116 S. Hollywood Way, Burbank, Calif.—D  
Kotron Rectifier Corp., 54 Clark St., Newark, 4, N.J.—H,I  
Lambda Electronics Corp., 103-02 Northern Blvd., Corona 68, N.Y.—D,E,J  
LANGEVIN MFG. CORP., 37 W. 65 St., New York 23, N.Y.—D  
Lectro-Max, Inc., 15 South First St., Geneva, Ill.—H  
Lee Electric & Mfg. Co., 2806 Clearwater St., Los Angeles 39, Calif.—A,D,H,J  
Lorain Products Corp., 1122 F St., Lorain, Ohio.—A,D  
Lysco Mfg., 1401 Clinton, Hoboken, N.J.—D  
McColpin-Christie Corp., 3410 W. 67 St., Los Angeles 43, Calif.—A,D,E,H  
Mackay Radio & Telegraph Co., 345 Hudson St., New York 14, N.Y.—D  
Mag-Electric Products, 14405 Crenshaw Ave., Gardiner Calif.—D,J  
Magnator, 246 Schuyler, Kearny, N.J.—D  
Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y.—A,J  
Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—A,B,D,E,H,I,K  
MALLORY & CO. P.R., 3029 E. Washington St., Indianapolis, Ind.—B,C,D,H,I,K

Mercury Electronic Co., Box 450, Red Bank, N.J.—D,E,J,K  
Miller Electric Co., P O Box 1827, Jacksonville, Fla.—A,B,D,E,H,I  
Minn.-Honeywell Regulator Co., Honeywell Aero Div., Minneapolis 13, Minn.—K  
Mission-Western Engrs. Inc., 132 W. Colo. St., Pasadena, Calif.—B  
Moulic Specialties Co., 1005 W. Washington St., Bloomington, Ill.—E,J  
Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—E,J  
National Spectrographic Labs., 6300 Euclid Ave., Cleveland 3, Ohio—D  
Nestor Eng'g. Co., 24 Chestnut St., Rutherford N.J.—E,I  
Neutronic Associates, 8356 Vietor Ave., Elmhurst, L.I., N.Y.—D  
Northeastern Eng'g. Corp., S. Bedford St., Manchester, N.H.—D  
North Electric Mfg. Co., S. Market St., Galion, Ohio.—A  
Oak Mfg. Co., 1260 Clybourn Ave., Chicago 10, Ill.—K  
Onan & Sons, Inc., D. W., 7833 University Ave. S.E., Minneapolis, Minn.—D  
Opad-Green Co., 71 Warren St., New York 7, N.Y.—A,D,E,H  
Oregon Corvek Co., 1005 N. W. 16 Ave., Portland, Ore.—K  
Oregon Electronic Mfg. Co., 2232 E. Burnside St., Portland 15, Ore.—D,E  
Perkin Eng'g. Corp., 345 Kansas St., El Segundo, Calif.—A,D,E,H,I  
Perma-Power Co., 4727 N. Damen Ave., Chicago 25, Ill.—A,D  
Peschel Electronics, Inc., 13 Garden St., New Rochelle, N.Y.—A,D,J  
Power Equip. Co., 5740 Nevada E., Detroit 34, Mich.—A,D,J  
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.  
Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—D  
Radiart Corp., 3455 Vega Ave., Cleveland 13, Ohio.—A,B,K  
Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—A,D  
Radio Products Co., 2300 W. Armitage Ave., Chicago 47 Ill.—A  
RADIO RECEPTOR, 84 N. 9 St., B'klyn 11, N.Y.—H  
Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—B,K  
Rapid Electric Co., 2881 Middletown Rd., Bronx, 61 N.Y.—A,C,D,H  
RAYTHEON MFG. CO., Waltham 54, Mass.—A,D,H,J,K  
Regulator Corp., Norwalk, Conn.—J  
Regulator Eng'g. & Devel. Co., 11545 W. Jefferson Blvd., Culver City, Calif.—D,J  
Remco Mfg. Co., 545 N. La Salle St., Chicago 10, Ill.—E  
Richardson-Allen Corp., 116-1515 Ave., College Point, L.I., N.Y.—A,D,G,H,J  
Rich Electronics, Inc., 212 N. W. 8 Ave., Miami 36, Fla.—D  
Schauer Mfg. Corp., 4500 Alpine Ave., Cincinnati 36, Ohio.—A,D,H,I  
S/C Laboratories, 37 George St., Newark 5, N.J.—D  
Selector Industries, Inc., 401 E. 138 St., New York 54, N.Y.—E,J  
Senn Corp., New Augusta, Ind.—K  
Smith-Meeker Eng'g. Co., 157 Chambers St., New York 7, N.Y.—A,D  
Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.—A,D,E,G,J  
Sparton Radio-TV, 2400 E. Ganson St., Jackson, Mich.—D  
Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—D  
Spera Electronics Labs., 37-10 33 St., Long Island City, N.Y.—D  
Standard Electrical Products Co., 2240 E. 3 St., Dayton 3, Ohio—J  
Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—E,J  
STANDARD TRANSFORMER CORP., 3580 Elston Ave., Chicago 18, Ill.—H,J,K  
Stevens Arnold Inc., 22 Elkins St., S. Boston 27, Mass.  
Stromberg-Carlson Co., Rochester 3, N.Y.—A,D,E,I  
Superior Electric Co., Bristol, Conn.—J  
SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway New York 19, N.Y.—E  
Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—B,F,J,K  
TARZIAN INC., SARKES, 415 N. College Ave., Bloomington, Ind.—H  
Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—B,D  
Teletronics Lab., 54 Kinkel St., Westbury, L.I. N.Y.—J  
Telex, 1633 Eustis St., St. Paul 1, Minn.—G  
Terado, 1068 Raymond, St. Paul 14, Minn.—K  
Thompson Clock Co., H. C. 38 Federal St., Bristol, Conn.—B,D,E,H,I  
Transformer Technicians, 2608 N. Cicero Ave., Chicago 39, Ill.—A,D,H  
Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—A,D  
Universal Electronics Co., 2013 S. Sepulveda Blvd., Los Angeles 25, Calif.—A,B,D,E,H,I,J  
Vickers Electric Div., Vickers, Inc., 1835 Locust St., St. Louis 3, Mo.—H  
VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio.—C,J,K  
Vokar Corp., Dexter, Mich.—K

Weich Mfg. Co., W. M., 1515 Sedgwick St., Chicago 10, Ill.—A,I  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—B  
 White Industries, 421 W. 54 St. New York 19, N.Y.—K  
 Wickes Eng'r. & Const. Co., 12 St. & Ferry Ave., Camden, N.J.—D

## 76—RELAYS

Relays, capacitance .....	A
Relays, coaxial .....	B
Relays, crossbar .....	D
Relays, differential .....	E
Relays, electronic .....	F
Relays, frequency selective .....	G
Relays, high voltage .....	H
Relays, impulse .....	I
Relays, keying .....	J
Relays, latching .....	K
Relays, mercury .....	L
Relays, overload .....	M
Relays, overvoltage .....	N
Relays, polarized .....	O
Relays, power .....	P
Relays, R-F .....	Q
Relays, rotary .....	R
Relays, sequence .....	S
Relays, stepping .....	T
Relays, subminiature .....	U
Relays, telephone .....	V
Relays, time-delay .....	W
Relays, undervoltage .....	X
Relays, vacuum contact .....	Y
Relays, vibrating reed type .....	Z
Relays, video switching .....	AA
Relays, solenoids .....	AB

ADAMS & WESTLAKE CO., 1025 N. Michigan, Elkhart, Ind.—L,M,N,P,W,X  
 Advance Electric & Relay Co., 2435 N. Naomi St., Burbank, Calif.—A,B,D,E,F,H,I,J,K,M,N,O,P,Q,S,U,V,W,X,AB  
 AIRCRAFT TRANSFORMER CORP., Long Branch, N.J.  
 Airpax Products Co., P.O. Box 137, Baltimore 20, Md.—B,E,H,I,J,K,M,N,O,P,Q,U,V,W,X,Z,AB  
 Allied Control Co., 2 East End Ave., New York 21, N.Y.—B,E,H,I,J,K,M,N,P,Q,R,U,V,W,X  
 American Instrument Co., Silver Spring, Md.—F,W  
 American Radiotelephone Co. Inc., 3505 4 St. N., St. Petersburg, Fla.—V  
 American Relay & Controls, Inc., 4901 W. Flournoy St., Chicago 44, Ill.—H,K,M,N,P,V,W,X  
 American TV & Radio Co., 300 E. 4 St., St. Paul 1, Minn.—Z  
 AMPERITE CO., INC., 561 Broadway, New York 12, N.Y.—W  
 Assembly Products, Main & Bell Sts., Chagrin Falls, Ohio.—I,M,W,Y  
 Automatic Electric Co., 1033 Van Buren St., Chicago 7, Ill.—I,J,K,O,Q,R,S,T,U,V,W,AB  
 Automatic Electric Mfg. Co. 10 State St., Mankato, Minn.—B,H,I,J,K,P,V,W  
 Automatic Electronic Eng'g. Co., 2207 E. North Ave., Milwaukee 2, Wis.—A  
 Automatic Switch Co., 319 Lakeside Ave., Orange, N.J.—E,G,K,N,P,W,X,AB  
 Automatic Temperature Control Co., 5212 Pulaski Ave., Philadelphia 44, Pa.—E,F,W  
 Barber-Coleman Co., 1300 Rock St., Rockford, Ill.—O  
 Barton Electronics, Inc., 955 Asylum Ave., Hartford 5, Conn.—F,M  
 Batsen Electronics Corp., J. A., 1031 S. 27th St., Omaha, Nebr.—Z  
 Bayside Watch Tool Co., 20-02 Utopia Parkway, Whitestone 57, New York, N.Y.—U  
 Biddle Co., Jas. G., 1316 Arch St., Phila. 7, Pa.—G,Z  
 BLONDER-TONGUE LABS., INC., 526 North Ave. E., Westfield, N.J.—W  
 Boehme, Inc., H. O., 915 Broadway, New York 10, N.Y.—P  
 Bunnell & Co., J. H., 81 Prospect St., Brooklyn 1, N.Y.—M,O,V  
 Calbest Eng'g. & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—F  
 Caltron Products Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.—AB  
 Cannon Electric Co., 3209 Humboldt St., Los Angeles 31, Calif.—AB  
 Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.—E,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—V,AB  
 Consolidated Vacuum Corp., 735 Ridge Rd. W., Rochester 3, N.Y.—Y  
 Continental Electronics Ltd., 302 Oakland St., Brooklyn 22, N.Y.—B  
 Cook Electric, 2700 Southport Ave., Chicago, 14, Ill.—E,F,G,H,I,J,K,M,P,S,T,U,V,W,X,AB  
 Corona Eng'g. Service, 94-52 Corona Ave., Elmhurst, L.I., N.Y.—F



Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,B,Q  
 Cramer Co., R. W., Box 49, Centerbrook, Conn.—W  
 Cunningham Son & Co., James, 13 Canal St. Rochester 8, N.Y.—D  
 Cutler-Hammer, Inc., 436 N. 12 St., Milwaukee 1, Wis.—F,G,H,M,S,T,W,X,Y,AB  
 DeCoursey Eng'g. Lab., P.O. Box 235, Los Angeles 25, Calif.—P  
 Deitz Co., S. J., 38 River Edge Rd., River Edge, N.J.—E,W  
 Detect-O-Ray Co., 2622 N. Halsted St., Chicago 14, Ill.—P  
 Dietz Co., Henry C., 12-16 Astoria Blvd., Long Island City 2, N.Y.—F  
 Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio—W  
 Dormitzer Electric & Mfg. Co., 5 Hadley St., Cambridge 40, Mass.—W  
 Eagle Signal Corp., 202 20 St., Moline, Ill.—W  
 Ebert Electronic Co., 185-09 Jamaica Ave., Hollis 7, N.Y.—L  
 Edison Inc., Thomas A., 93 Lakeside Ave., W. Orange, N.J.—M,N,W,X  
 Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.—P,W  
 Elastic Stop Nut Corp., 1027 Newark Ave., Elizabeth 3, N.J.—W  
 Electric Regulator Corp., Pearl St., Norwalk, Conn.—E,N,X  
 Electro Craft Inc., 68 Jackson St., Stamford, Conn.—F,AB  
 Electro-Mechanical Specialties, 6819 Melrose Ave., Los Angeles 38, Calif.—F,H,M,P,U  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—F,M  
 Electro-Physics Co., 287 Broadway, New York 7, N.Y.—F  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—K,L,M,N,P,S,U,V,W,AB  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—AB  
 Eng'g. Research & Development Co., Addison, Ill.—A,F  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—B,G,H,I,J,K,M,O,P,Q,S,T,V,W,Z,AB  
 Eureka TV & Tube Corp., 69 Fifth Ave., Hawthorne, N.J.—F,U,W  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—O  
 Farmer Electric Co., 21 Mossfield Rd., Waban 68, Mass.—W  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—V  
 Filtrors, Inc., 30 Sagamore Hill Dr., Port Washington, N.Y.—F,G,H,J,R,U,Z  
 Five Star Co., West Main St., Plantsville, Conn.—F,AB  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—AB  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—H,Q  
 Gavco Corp., 540 E. 80 St., New York, N.Y.—P  
 General Aviation Corp., 540 E. 80 St., New York 21, N.Y.—P  
 General Communications, P.O. Box 169, Fort Atkinson, Wis.  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—E,H,I,K,M,N,P,S,T,W,X,AB  
 Glaser-Steers Corp., 2 Main St., Belleville, N.J.—W  
 GUARDIAN ELECTRIC MFG. CO., 1621 W. Walnut St., Chicago 12, Ill.—B,F,G,H,I,J,K,M,P,T,V,W,AB  
 G-V Controls Inc., 28 Hollywood Plaza, East Orange, N.J.—M,N,W,X  
 Haledy Electronics Co., 57 William St., New York 5, N.Y.—F,L,W  
 Hansen, Co. Wm., 165 Silverbrook Ave., Niles, Mich.—A,F  
 HART MFG. CO., 202 Bartholomew Ave., Hartford, Conn.—S,T,U  
 Heineman Electric Co., Penn. Ave. & Plum St., Trenton 2, N.J.—W  
 Hercules' Elec. Mach'y. & Equip. Co., 1442 E. Washington Blvd., Los Angeles 21, Calif.—M,V,AB  
 Hoffman Eng'g. Corp., Anoka, Minn.—K  
 Industrial Electronics Co., Hanover St., Hanover, Mass.—F,M  
 Industrial Timer Corp., 115 Edison Place, Newark 5, N.J.—W  
 IQ Industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—F,W  
 JENNINGS RADIO MFG. CO., P.O. Box 1278, San Jose 8, Calif.—H,I,J,K,M,P,Q,Y  
 JOHNSON CO., E. F., Waseca, Minn.—Q  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 Monroe St., Chicago 3, Ill.—D,I,O,S,T,V  
 KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—R  
 Kinetex Inst. Co., 902 Broadway, New York 10, N.Y.—M  
 Kurman Electric Co., 35-18 37 St., Long Island City 1, N.Y.—F,J,K,O,V,W,Z

Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.—M,N  
 Leland Inc., G. H., 123 Webster St., Dayton 2, Ohio—T,AB  
 Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill.—A,F,W  
 Lyman Electronic Corp., 12 Cass St., Springfield, Mass.—Q  
 Lysco Mfg. Co., 1401 Clinton St., Hoboken, N.J.—B  
 Mack Electric Devices, 37 Glenside Ave., Wyncote, Pa.—L,P,Y,AB  
 Mag-Electric Products, 14405 Crenshaw Ave., Gardiner, Calif.—N,X  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.  
 Mark Products Co., 3547 Montrose Ave., Chicago 18, Ill.—B  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—O  
 May Eng'g. Co., 6055 Lankershim Blvd., N. Hollywood, Calif.—W  
 Mepec Inc., Abbett Ave., Morristown, N.J.—AB  
 Mercoind Corp., 4201 Belmont Ave., Chicago 41, Ill.—L  
 Mercury Contacts, P.O. Box 615, Far Hills Station, Dayton 9, Ohio.—L  
 Minn.-Honeywell Regulator Co., Wayne & Windrim Sts., Philadelphia 44, Pa.—F,P  
 Neomatic, Inc., 9010 Bellanca Ave., Los Angeles 45, Calif.—E,F,I,K,M,N,O,U  
 North Electric Mfg. Co., S. Market St., Galion, Ohio—I,K,O,U,V,W  
 Oak Mfg. Co., 1260 Ciybourn Ave., Chicago 10, Ill.—R  
 Panoramic Radio Products, 10 S. 2 Ave., Mt. Vernon, N.Y.—F  
 Parts Producing Corp., 1861 Second Ave., New York 28, N.Y.—O,V  
 Penta Labs., Inc., 216 N. Milpas St., Santa Barbara, Calif.—Y  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—E,G,K,M,N,O,P,U,W,Y,AB  
 Phila. Scientific Glass Co., 4 Eckard Ave., Abington, Penna.—F,L,P  
 Photobell Co., 116 Nassau St., New York 38, N.Y.—A,F,K,W  
 Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—F,W  
 Pickering & Co., 309 Woods Ave., Oceanside, N.Y.—AB  
 Pioneer Electronics Corp., 2232 Broadway, Santa Monica, Calif.—Y  
 Potter & Brumfield, Princeton, Ind.—I,J,K,P,S,U,V,W  
 Price Electric Corp., 153 Church St., Frederick, Md.—B,E,F,H,I,K,M,P,Q,R,S,T,U,V,W,AB  
 Process & Instruments, 60 Greenpoint Ave., Brooklyn 22, N.Y.—F,L  
 P S P Engineering Co., 8420 Otis St., South Gate, Calif.—AB  
 Radiation, Inc., Box Q, Melbourne, Fla.—E  
 R-B-M Division, Essex Wire Corp., 131 Godfrey, Logansport, Ind.—F,M,T,U,V,AB  
 RADIO CORP. OF AMERICA, RCA TUBE DEPT., 415 S. Fifth St., Harrison, N.J.—R,S  
 Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford 6, Conn.—W  
 Rich Electronics Inc., 212 N.W. 8 Ave., Miami 36 Fla.—H,Q  
 Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis 5, Ind.—F,S,W  
 Roesch Co., D. J., 220 S. Figuerola St., Los Angeles 7, Calif.—I,P  
 Roflan Co., Topsfield, Mass.—Q  
 Safe Flight Instrument Corp., 4 Water St., White Plains, N.Y.—O,R  
 Servo-Tex Products Co., 1086 Goffle Rd., Hawthorne, N.J.—F  
 Sightmaster Corp., 111 Cedar St., New Rochelle, N.Y.—F,O  
 Signal Engineering & Mfg. Co., 145 W. 14th St., New York 11, N.Y.—B,F,J,K,O,P,U,V,W  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—W,AB  
 Standard Electrical Products Co., 2240 E. Third St., Dayton 3, Ohio.—E,H,J,K,L,M,P,Q,V,W,AB  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—B,D,F,H,I,J,K,M,N,O,P,Q,T,V,W  
 Staver Co. 41-51 N. Saxon Ave., Bay Shore, N.Y.—G,H,Z  
 Sterling Eng'g. Co., 54 Mill St., Laconia, N.H.—U,V  
 Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.—F,V  
 Stromberg-Carlson Co., Rochester 3, N.Y.—I,O,V,Z  
 Struthers Dunn, Inc., 150 N. 13th St., Philadelphia 7, Pa.—H,I,J,K,L,M,P,R,S,T,U,W,Y  
 Tallen Co., 159 Carlton Ave. Brooklyn 5, N.Y.—F,J,R,T,U,V,W,AB  
 Tech Labs. Inc. Palisades Park., N.J.—AB  
 Technicraft Labs. Inc., Thomaston-Waterbury Rd., Thomaston, Conn.  
 Teleto Industries Corp., 35-16 37 St., Long Island City 1, N.Y.  
 Terado Co., 1068 Raymond Ave., St. Paul 14, Minn.  
 Thermo-Instrument Co., 1166 El Camino Real, Belmont, Calif.—F,P  
 Thompson Clock, H. C., 38 Federal St., Bristol, Conn.—F,G,I,K,O,P,S,T,U,V,W,AB  
 Thompson Products Inc. 2196 Clarkwood Rd., Cleveland 3, Ohio—Q  
 Timetrol Co., 2919 Gladstone Ave., Rockford, Ill.—W



Transvision, Inc., New Rochelle, N.Y.—AB  
 Ulanet Co., George, 413 Market St., Newark,  
 5, N.J.—W  
 VICTOREEN INSTRUMENT CO., 3800 Per-  
 kins Ave., Cleveland 14, Ohio—W  
 Victory Eng'g. Corp., Springfield Rd., Union,  
 N.J.—W  
 Walkirt Co., 145 W. Hazel St., Inglewood 3,  
 Calif.—F  
 Welch Electric Co., 1221 Wade St., Cincin-  
 nati 14, Ohio—E,U  
 Weltronic Co., 19500 W. 8 Mile Rd., Detroit  
 19, Mich.—F  
 Ward Leonard Electric Co., 115 MacQueston  
 Pkwy S., Mount Vernon, N.Y.—J,K,M,P,Q,  
 W,X  
 Weston Electrical Instrument Corp., 614 Fre-  
 linghuysen Ave. Newark 5, N.J.—P,T,V,W  
 Wilson & Co., G. C., 2 No. Passaic Ave., Chat-  
 ham, N.J.—W  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El  
 Monte, Calif.—K,O,U,Y  
 Worner Electronic Devices, Rankin, Ill.—F  
 Wright Zimmerman, Inc., 330 Fifth Ave., New  
 Brighton 12, Minn.—E

Ceramic Heater Cathode Register Co., 20 1  
 Street, Keyport, N.J.—H,J,K  
 Chase Resistor Co., 9 River St., Morristown,  
 N.J.—B,C,D,J,K  
 CHICAGO TELEPHONE SUPPLY CORP.,  
 1142 W. Beardsley Ave., Elkhart, Ind.—  
 J,K,L,P,R,S,U  
 Cima Corp., 119 Braintree St., Allston Mass.  
 —F,G,J  
 CINEMA ENG'G. CO., DIV AEROVOX CORP.,  
 1510 W. Verdugo Ave., Burbank, Calif.  
 F,Q,U  
 CLAROSTAT MFG. CO., Washington St.,  
 Dover, N.H.—B,F,J,K,P,Q,R,S,U,V  
 Coil Winders Inc., N.Y. Ave., Westbury, L.I.,  
 N.Y.—F  
 Columbia Resistors, 216 Lafayette St., New  
 York 12, N.Y.—F,G,L,V  
 Colvin Labs., 12 Court St., Morristown, N.J.  
 —S,U  
 CONTINENTAL CARBON INC., 13900 Lorain  
 Ave., Cleveland 11, Ohio—D,F,J,M  
 Cornell Electronics Corp., 40 Main Ave.,  
 Donglston, N.Y.—Q,U  
 Corning Glass Works, P.O. Box 544, Corning,  
 N.Y.—D,G,K,S  
 Costelow Co., John A., 125 Kansas Ave., To-  
 peka, Kan.—I,Q,R,S,U,V  
 Cutler-Hammer, Inc., 436 N. 12 St., Milwaukee  
 1 Wisc.—F,G,L,P,V  
 Dale Products Inc., Box 1, Columbus, Nebr.—  
 C,D,E,F,G,J,K,V  
 Daven Co., 191 Central Ave., Newark 4, N.J.  
 —B,F,I,J,K,L,P,Q,R,S,U  
 DeJur Amsco Corp., 45-01 Northern Blvd.,  
 Long Island City 1, N.Y.—S,U,V  
 Delta Electronics, Inc., Div. of Electronic In-  
 dicator Corp., 259 Green St., Brooklyn 22,  
 N.Y.—J  
 Electra Mfg. Co., 2537 Madison Ave., Kansas  
 City, Mo.—C  
 Electro Eng'g. Products Co., 609 W. Lake St.,  
 Chicago 10, Ill.—A,F  
 Electro-Mec Lab., 19 Murray St., New York  
 7, N.Y.—F,J,K,L,P,S,T,U  
 Electronic Associates, Long Branch, N.J.—S  
 Electronics of Colo., 1026 S. Tejon St., Colo-  
 rado Springs, Colo.—D,J  
 Electron-Radar Products, 1041 N. Pulaski  
 Rd., Chicago 51, Ill.—F,N,Q  
 Electro-Tech Equip. Co., 308 Canal St., New  
 York, N.Y.—G,L,V  
 Empire Devices, Inc., 38-25 Bell Blvd., Bayside  
 61, N.Y.—E,Q  
 Equipment & Service Co., 6815 Oriole Dr.,  
 Dallas 9, Texas—C,D,G,J,L,P,Q,R,S,T,U  
 Erie Resistor Corp., 644 W. 12 St., Erie 6,  
 Pa.—C,M  
 FAIRCHILD CAMERA & INSTRUMENT  
 CORP., Robbins Lane, Syosset, N.Y.—Q,R,S,  
 T,U  
 Ford Eng'g., 129 E. A. St., Upland, Calif.—V  
 FRIEZ INSTRUMENT DIV., BENDIX AVIA-  
 TION CORP., 1454 Taylor Ave., Baltimore  
 4, Md.—O  
 Galectronics Inc., Pasadena, Calif.—S  
 Gamewell, Newton Uppers Falls 64, Mass.—S  
 General Cement Co., 919 Taylor Ave., Rock-  
 ford, Ill.—M  
 GENERAL ELECTRIC CO., Apparatus Div.,  
 1 River Rd., Schenectady 5, N.Y.—F,J,N,O,  
 P,V  
 GENERAL ELECTRIC CO., Carbaloy Dept.,  
 11177 E. Eight Mile Rd., Detroit, Mich.—N  
 GENERAL RADIO CO., 275 Mass. Ave., Cam-  
 bridge 39, Mass.—B,J,L,Q,U  
 Genisco, Inc., 2233 Federal Ave., Los Angeles,  
 64, Calif.—S,U  
 Giannini & Co., G. M., 590 S. Fair Oaks, Pasa-  
 dena 2, Calif.—Q,S,T,U  
 Hallett Mfg. Co., 1601 W. Florence Ave., In-  
 glewood, Calif.—M  
 Hamilton-Hall Mfg. Co., 227 N. Water St.,  
 Milwaukee, Wisc.—F  
 Hardwick Hindle, Inc., 40 Hermon St., New-  
 ark 5, N.J.—F,T,U,V  
 HELIPOT CORP., 916 S. Meridian Ave., S.  
 Pasadena, Calif.—S,U  
 HI-Q DIV. AEROVOX CORP., Olean, N.Y.—  
 A,B,C,F,Q,V  
 Hycor Co., 11423 Vanowen St., N. Hollywood,  
 Calif.—R,F,F,V  
 Instrument Resistors Co., 1036 Commerce St.,  
 Union, N.J.—B,F,J,K,S,U  
 International Resistance Co., 401 N. Broad  
 St., Philadelphia 8, Pa.—A,C,D,E,F,G,J,K,L,  
 P,R,U  
 INSULINE CORP. OF AMERICA, 36-02 35  
 Ave., Long Island City 1, N.Y.—F  
 I-T-E Circuit Breaker Co., 19 & Hamilton  
 Sts., Philadelphia 30, Pa.—A,C,F,G,J,L  
 Janco Corp., 311 Winona Ave., Burbank, Calif.  
 —J  
 Jarvis Electronics Corp., 6058 Fullerton Ave.,  
 Chicago 39, Ill.—S,T,U  
 Kalbfell Labs. Inc., 1090 Morena Blvd., San  
 Diego 10, Calif.—Q  
 Keystone Carbon Co., 1935 State St. St.  
 Marys, Pa.—H,N  
 K-F Development Co., 2606 Spring St., Redwood  
 City, Calif.—S  
 Lechtrohm, Inc., 5560 Northwest Highway,  
 Chicago 30, Ill.—F,G,L  
 LFGR I CO., S., 158 W. 99 St., New York 5,  
 N. Y. — A,B,C,D,E,F,G,H,I,J,K,L,O,P,Q,R,  
 S,T,U,V  
 MALLORY & CO. P. R., 3029 E. Washington  
 St., Indianapolis 6, Ind.—B,C,D,E,F,G,L,P,  
 U,Q,V  
 Marktite Corp., 155 Waverly Pl., New York  
 14, N.Y.—R,S

Marma Electronic Co., 703 Willow St., Chicago  
 14, Ill.—B  
 Mepco, Inc., 37 Abbebt Ave., Morristown, N.J.  
 —B,F,G,H,J,K  
 Micro-Circuits Co., New Buffalo, Mich.—H  
 Micromax Co., 1964 Utica Ave., Brooklyn 34,  
 N.Y.—Q,R,S  
 Milwaukee Resistor Co., 700 W. Virginia St.,  
 Milwaukee 4, Wisc.—F,L  
 Monson Corp., 919 N. Michigan Ave., Chicago,  
 Ill.—C,J,L,U  
 Muter Co., 1255 S. Michigan Ave., Chicago 5,  
 Ill.—F,U  
 NATIONAL CO., Malden, Mass.—E  
 National Electronic Mfg. Corp., 42-08 Vernon  
 Blvd., Long Island City 1, N.Y.—M  
 Neptune Electronic Co., 433 Broadway, New  
 York 13, N.Y.—E,F,G,L,P,R,U,V  
 Ohio Carbon Co., 12508 Berea Rd., Cleveland 1,  
 Ohio—E,F  
 Ohmite Mfg. Co., 4835 W. Fluornoy St., Chi-  
 cago 44, Ill.—B,E,F,G,J,L,R,T,U,V  
 Ohmweve Co., 43 Darcy, W. Hartford, Conn.—F  
 PHAOSTRON CO., 151 Pasadena Ave., S.  
 Pasadena, Calif.—C,F,J,K  
 PHOTOCIRCUITS CORP., Glen Cove, N.Y.—E  
 Plastics & Electronics Co. Inc., 272 Northland  
 Ave., Buffalo 8, N.Y.—D,K  
 Radell Corp., 7900 Pendleton Pike, Indianap-  
 olis 26, Ind.—C  
 Rapid Electric Co., 2881 Middletown Rd., Bronx  
 61, N.Y.—J  
 Rattray & Co., Geo., 92-32 Union Hall St., Ja-  
 maica 2, N.Y.—Q,S,U  
 Rawson Electrical Instrument Co., 117 Potter  
 St., Cambridge 42, Mass.—F  
 Reon Resistor Corp., 117 Stanley Ave., Yonk-  
 ers, N.Y.—B,F,J  
 Research Instrument Co., 233 Broadway, New  
 York 7, N.Y.—F,G,J,L,Q,T,U  
 RESISCO CORP., 366 Broadway, New York,  
 N.Y.—E,R  
 RESISTANCE PRODUCTS CO., 714 Race St.,  
 Harrisburg, Pa.—D,E,F,G,J,K  
 Resistors, Inc., 5226 W. 26 St., Cicero, Ill.—  
 F,G,L,T,U  
 Rex Rheostat Co., 3 Foxhurst Rd., Baldwin,  
 L.I., N.Y.—F,L,T,U,V  
 Rollin Co., 2010 N. Lincoln Ave., Pasadena 3,  
 Calif.—N  
 Ruckelshaus Labs. Inc., John G., 110 Pomeroy  
 Rd., Madison, N.J.—D,I,J,L,K,Q,S  
 Servo Corp. of America, 2020 Jericho Turn-  
 pike, New Hyde Park, L.I., N.Y.—N  
 Servotrol Co., 114 W. Illinois St., Chicago 10,  
 Ill.—S,U  
 SHALLCROSS MFG. CO., 520 Pusey Ave.,  
 Collingdale, Pa.—B,F,G,I,J,K,L,P,Q,R,S,U  
 Slate & Associates, Claude C., 11370 W. Olymp-  
 ic Blvd., Los Angeles 64, Calif.—J  
 Southwestern Industrial Electronics Co., 2331  
 Post Oak Rd., Houston, Texas—R  
 SPEER RESISTOR DIV., SPEER CARBON  
 CO., St. Marys, Pa.—E  
 SPRAGUE ELECTRIC CO., 233 Marshall St.,  
 No. Adams, Mass.—A,C,D,F,J,K  
 STACKPOLE CARBON CO., St. Marys, Pa.—  
 E,G,H,J,L,P,R  
 Standard Electronics Corp., 285 Emmet St.,  
 Newark 5, N.J.—O,T,V  
 States Co., 19 New Park Ave., Hartford, Conn.  
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 Stoddart Aircraft Radio Co., 6644 Santa Mon-  
 ica Blvd., Hollywood 38, Calif.—Q  
 Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.—N  
 Supreme Inc., Greenwood, Miss.—F  
 Symphony Radio Corp., 925 Southwestern  
 Ave., Los Angeles 6, Calif.—E  
 Tallen Co., 159 Carlton Ave., Brooklyn 5,  
 N.Y.—O,V  
 Tech Labs. Inc., 120 Hillcrest Ave., Leonia,  
 N.J.—L,P,Q,S  
 Technology Instrument Corp., 53 Main St.,  
 Acton, Mass.—S,T,U  
 Tech-Ohm Resistor Corp., 200-15 32 Ave., Bay-  
 side, L.I., N.Y.—F,G,H  
 Teleweve Labs., 100 Metropolitan Ave., Brook-  
 lyn 11, N.Y.—K  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.  
 —C,I,N,P,Q,S,T,U  
 Thompson Clock Co., H. C., 38 Federal St.,  
 Bristol, Conn.—B,F,G,I,K,L,R,S,T,U  
 Tru-Ohm Products, Div. Model Eng'g. & Mfg.  
 Co., 2800 N. Milwaukee Ave., Chicago 18, Ill.  
 —F,L,T,U,V  
 Van Dyke Instruments, 1927 First Ave. S., St.  
 Petersburg, Fla.—K,L,S  
 VECTRON, INC., 400 Main St., Waltham 54,  
 Mass.—L,S,U  
 VICTOREEN INSTRUMENT CO., 3800 Per-  
 kins Ave., Cleveland 14, Ohio—C,J  
 Victory Eng'g. Corp., Springfield Rd., Union,  
 N.J.—H,L,N,O  
 Vokar Corp., Dexter, Mich.—F,K  
 Ward Leonard Electric Co., 115 McQueston  
 Pkwy. So., Mount Vernon, N.Y.—F,G,Q,U,V  
 Waters Mfg. Co., 4 Gordon St., Waltham 54,  
 Mass.—S,U  
 Western Radiation Lab., 1107 W. 24 St., Los  
 Angeles 7, Calif.—A  
 WHITE DENTAL MFG. CO., S. S., 10 E. 40th  
 St., New York 16, N.Y.—E,G  
 Wilkor Div., Aerovox Corp., 2882 Detroit  
 Ave., Cleveland 13, Ohio—A,C,D,F,H,J  
 Wood Co., Ash M., 11938 E. Garvey Blvd. El  
 Monte, Calif.—B,E,F,J,K,L,P,Q,S,U  
 Yonkers Industries, Inc., 28-30 School St.,  
 Yonkers, N.Y.—F,G,H,J,O,S,U  
 Zenith Optical Lab., 1940 Great Neck Rd.,  
 Copiague, L.I., N.Y.—D,J

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- Attenuators, precision . . . . . Q**
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- Potentiometers, wire-wound . . . . . U**
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- Thermistors . . . . . N**
- Varistors . . . . . O**
- Volume controls . . . . . P**

Ace Coil & Electronics Co., 914 Middlesex Ave.,  
 Metuchen, N.J.—F,J  
 AEROVOX CORP., 740 Belleville Ave., New  
 Bedford, Mass.—A,B,C,F,Q,V  
 Allen-Bradley Co., 110 W. Greenfield Ave.,  
 Milwaukee 4, Wisc.—E  
 Amalgamated Electronics, Clinton Corners,  
 N.Y.—F,I,J  
 Arma Corp., Roosevelt Field, Garden City,  
 N.Y.—S  
 Arnhold Ceramics, Inc., 1 E. 57 St., New York  
 22, N.Y.—C,D,F,H,J,K  
 Associated Research, 3758 W. Belmont Ave.,  
 Chicago 18, Ill.—F  
 Atlas Resistor Co., 423 Broome St., New York  
 13, N.Y.—F,L  
 Audio & Video Products Corp., 730 5 Ave.,  
 New York 19, N.Y.—A,B,C,D,E,F,G,H,J,K,  
 L,M,P,Q,R,S,T,U,V  
 Autel Electronics Co. 1947 Farmingdale Rd.,  
 Westfield, N.J.—R  
 Automatic Electric Co., 1033 W. Van Buren  
 St., Chicago 7, Ill.—F  
 Batsen Electronics Corp., J. A., 1031 S. 27 St.,  
 Omaha, Nebr.—F  
 Bayside Watch Tool Co., 20-02 Utopia Pkwy.,  
 Whitestone 57, N.Y.—K  
 Berkshire Labs., 586 Beaver Pond Rd., Lincoln,  
 Mass.—I  
 Biddle Co., 1316 Arch St., Phila. 7, Pa.—V  
 Birkkan Corp., 200 E. 3, Mt. Vernon, N.Y.—S  
 BOGART MFG., 315 Seigel St., B'klyn 6,  
 N.Y.—N  
 Bond Electronics Corp., 60 Springfield Ave.,  
 Springfield, N. J.—F,G,J,K  
 BORG EQUIPMENT DIV. GEO. W. BORG  
 CORP., 120 S. Main St., Janesville, Wisc.—  
 J,S,U  
 Bourns Labs., 6135 Magnolia Ave., Riverside,  
 Calif.—K,L,S,T,U  
 Brooks Radio & TV Corp., 84 Vesey St., New  
 York 7, N.Y.—F,L,P,U  
 Brown Electro-Measurement Corp., 4635 S.E.  
 Hawthorne Blvd., Portland 15, Ore.—B,F,J,  
 T,S,U  
 Campbell Industries, St. Elmo Station, Chat-  
 tanooga 9, Tenn.—B,C,D,H,J  
 Carborundum Co., Globar Div., Hyde Park  
 Blvd., Niagara Falls, N.Y.—E,G,H,K,M,O  
 Carol Electronics Corp., 141 E. 25 St., New  
 York 10, N.Y.—J  
 Carter Parts Co., 213 Institute Pl., Chicago  
 10, Ill.—F,L,P,U  
 CENTRALAB, DIV. GLOBE-UNION, INC.,  
 900 E. Keefe Ave., Milwaukee 1, Wisc.—E,K,  
 L,P,R,U  
 Central Scientific Co., 1700 Irving Park Rd.,  
 Chicago 13, Ill.—B,T

**78—SEMI-CONDUCTORS**

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- Diodes, silicon . . . . . **B**
- Transistors . . . . . **C**

Allied Research & Eng'g., 1041 N. Los Palmas Ave., Hollywood 38, Calif.—C  
 Ampere Electronic Corp., 230 Duffly Ave., Hicksville, L.I., N.Y.—A,C  
 Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—A,C  
**BENDIX AVIATION CORP.**, Red Bank Div., Eatontown, N.J.—C  
**BERKSHIRE LABS.**, 586 Beaver Pond Rd., Lincoln, Mass.—A  
 British Industries, 164 Duane St., New York, N.Y.—A,B,C  
**BRUSH ELECTRONICS CO.**, 3405 Perkins Ave., Cleveland 14, Ohio—A,C  
**CBS-HYTRON, INC.**, 100 Endicott St., Danvers, Mass.—A,C  
 Eagle-Picher, American Bldg., Cincinnati, 1, Ohio—A  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—A,B,C  
 Equip. & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A  
**GENERAL ELECTRIC CO.**, Apparatus Div., 1 River Rd., Schenectady, N.Y.—A,C  
**GENERAL ELECTRIC CO.**, Electronics Park, Syracuse, N.Y.—A,C  
**GENERAL R-F FITTINGS CO.**, 702 Beacon St., Boston 15, Mass.—A  
 Gudeman Co., 340 W. Huron St., Chicago 10, Ill.—A  
**HERMETIC SEAL PRODUCTS CO.**, 33 S. 6th St., Newark 7, N.J.—C  
 Hydro-Aire, Inc., 3000 Winona Ave., Burbank, Calif.—C  
**INTERNATIONAL RECTIFIER CORP.**, 1521 E. Grand Ave., El Segundo, Calif.—A  
 Kemtron Electron Products, Inc., 23 Brown St., Salem, Mass.—A,B,C  
 Maxson Corp., W.L., 460 W. 34 St., New York 1, N.Y.—C  
**MICROWAVE ASSOCIATES**, 22 Cummington St., Boston 15, Mass.—B,C  
 Monson Corp., 919 N. Michigan Ave., Chicago 11, Ill.—A  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—C  
 National Union Radio Corp., Jacksonville Rd., Hatboro, Pa.—A,C  
 Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—C



Radio Devel. & Research Corp., Germanium Products Corp. Div., 26 Cornelison Ave., Jersey City 4, N.J.—A,C  
**RADIO RECEPTOR CO.**, 251 W. 19 St., New York 11, N.Y.—A,B,C  
**RAYTHEON MFG. CO.**, 55 Chapel St., Newton 58, Mass.—C  
**RCA TUBE DEPT.**, 415 S. 5 St., Harrison, N.J.—A,C  
 Research Electronics Labs., Roslyn, Pa.—C  
 Standard Tele. & Cables, Ltd., Connaught House, Aldwych, London W. C. 2, England—A,C  
**STATE LABS. INC.**, 649 Broadway, New York 12, N.Y.—C  
**SYLVANIA ELECTRIC PRODUCTS**, 1740 Broadway, New York 19, N.Y.—A,B,C  
 Tallon Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,C  
 Teletronics Laboratory, 54 Kinkel St., Westbury, L.I., N.Y.—C  
 Texas Instruments Inc., 6000 Lemmon Ave., Dallas, Texas—C  
 Transistor Products Inc., 55 Union St., Boston, Mass.—A,C  
 Transatron Electronic Corp., 403 Main St., Melrose, Mass.—A,B,C  
**TUNG-SOL ELECTRIC INC.**, 95 8 Ave., Newark 4, N.J.—A,C  
 Western Electric, 120 Broadway, New York, N.Y.—C  
 Western Mfg. Co., 1400 W. 22nd St., Kearney, Nebr.—A,B  
**WESTINGHOUSE ELECTRIC CORP.**, Electronic Tube Div., Box 284, Elmira, N.Y.—C  
 Wood Co., Ash M., 11938 E. Garvey Blvd., Monte, Calif.—C

Atlas Film Corp., 111 South Blvd., Oak Park, Ill.—O  
 Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—P  
**Audio-Master Corp.**, 341 Madison Ave., New York 17, N.Y.—G,J,K,L,O,P,Q,Y  
 Audio Production, Inc., 630 9 Ave., New York 36, N.Y.—F  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—B,K,O,P,Q,R,U  
 Avec Productions, 218 E. Huron St., Chicago, Ill.—F,U  
 Background Engineers, 7313 Santa Monica Blvd., Hollywood 46, Calif.—X,W  
 Bailey Films, Inc., 6509 De Longpre Ave., Hollywood 28, Calif.—U  
 Barbre Motion Picture Productions, 1215 E. Virginia, Denver 9, Colo.  
 Basch Radio & TV Productions, 17 E. 45 St., New York 17, N.Y.—F  
 Becker Productions, V. S. 562 5 Ave., New York 36, N.Y.—U  
 Beeland-King Film Productions, 752 Spring St., N.W., Atlanta, Ga.—C,F,G,M,P,R,U,W  
 Bell Picture Corp., 630 9 Ave., New York 36, N.Y.—F  
 Bell Sound Systems, 555 Marion Rd., Columbus 7, Ohio—O  
**BERKELEY SCIENTIFIC, DIV. BECKMAN INSTRUMENTS, INC.**, 2200 Wright Ave., Richmond, Calif.—H  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—I  
 Boulevard Recording Studio, 25 E. Jackson Blvd., Chicago 4, Ill.—O,P,Q,R,Y  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—N  
 Bracken Productions, Inc., 8259 Beverly Blvd., Los Angeles 48, Calif.—F  
 Brandon Films, Inc., 200 W. 57 St., New York 19, N.Y.—F  
 Bray Studios, Inc., 729 7 Ave., New York 19, N.Y.—F  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—B,A,B  
 Brown Radio Productions, Inc., 101 S. Maramec, St. Louis 5, Mo.—O  
 Byron, Inc., 1226 Wisconsin Ave., N.W., Washington, D.C.—F  
 Buhl Optical Co., 1009 Beech Ave., Pittsburgh 12, Pa.—N  
 Calbest Eng'g. & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—B,A,G  
 Calhoun Studios, 266 E. 78 St., New York, N.Y.—F  
 Calvin Co., 1105 Truman Rd., Kansas City 6, Mo.—F  
**CAMERA EQUIP. CO.**, 1600 Broadway, New York 19, N.Y.—L  
**CAMERA MART**, 1845 Broadway, New York 23, N.Y.  
 Campbell Recording Co., 2114 Avon, Wichita 16, Kans.—O  
 Capitol Records, Inc., 5515 Melrose Ave., Hollywood 38, Calif.—J,K,L,O,R  
 Caravel Films, Inc., 730 5 Ave., New York, N.Y.—F  
**CARGO-PACKERS, INC.**, 73 Rutledge St., Brooklyn 11, N.Y.  
**CENTRALAB, DIV. GLOBE-UNION INC.**, 900 E. Keefe Ave., Milwaukee 1, Wisc.—B  
 Cinecraft Productions, Inc., 2515 Franklin Ave., Cleveland 13, Ohio.—F  
 Cinegraphics, Inc., 5 E. 57 St., New York 22, N.Y.—F  
 Cinemart, Inc., 322 E. 44 St., New York 17, N.Y.—F,X,Y  
 Cinematic Devel. & Cinechrome Lab., 2125 32 Ave., San Francisco, Calif.—R  
 Clark Crystal Co., 2 Farm Rd., Marlboro, Mass.—H  
 Columbia Pictures Corp., 1438 N. Gower St., Hollywood 28, Calif.—F  
 Commercial Radio Monitoring Co., P.O. Box 7037, Kansas City, Mo.—H  
 Consolidated Televisions, Inc., Sunset Blvd. at Van Ness, Hollywood, Calif.—F  
 Cook Labs., Inc., 114 Manhattan St., Stamford, Conn.—O  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—S,T  
 Crosby Enterprises Inc., Bing, 9030 Sunset Blvd., Los Angeles 46, Calif.—F  
 Damon Recording Studios Inc., 117 W. 14 St., Kansas City 6, Mo.—O,R  
 Daven Co., 191 Central Ave., Newark 4, N.J.—B  
 De Frenes Co., 1909 Buttonwood St., Philadelphia 30, Pa.—R  
 Dephoure Studios, 782 Commonwealth Ave., Boston 15, Mass.—O  
 Diatron Co., 3327 Dixie Dr., Houston 21, Tex.—H  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—B,H,R  
**DUMONT LABS. INC.**, ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—G,J,U,Y  
**DUMONT LABS., INC.**, ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—F,G,I,R,U,V,W,X,Y  
 Eastern Film Center, 1218 E. Chelton Ave., Philadelphia 38, Pa.—F  
 Eccles Recording, Inc., 6233 Hollywood Blvd., Hollywood 28, Calif.—O  
 E D L Co., 5929 E. Dunes Highway, Gary 5, Ind.—D,E  
 Eidson Electronic Co., 1902 N. 3 St., Temple, Texas.—H  
 Eldico of N.Y., 44-31 Douglaston Pkwy, Douglaston, L.I., N.Y.—H,Q

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- Frequency measuring** . . . . . **H**
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- TV props & scenery** . . . . . **V**
- TV special effects** . . . . . **W**
- TV slides** . . . . . **X**
- Transcriptions** . . . . . **Y**
- Engineering—see list of consulting engineers**

Academy Film Products, Inc., 123 W. Chestnut St., Chicago, Ill.—F,X  
 Adelphi Co., 5619½ Sunset Blvd., Hollywood 28, Calif.—F  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—B  
 Affiliated Photographic Co., 21 W. 45 St., New York 19, N.Y.—X  
 Air-Tone Sound & Recording Co., 1527 Chestnut St., Philadelphia 2, Pa.—O  
 Airtronix Development Corp., 20 W. 22 St., New York 10, N.Y.—B  
 Alexander Film Co., Alexander Film Bldg., Colorado Springs, Colo.—F  
 Allied Int'l Inc., 230 Park Ave., New York 17, N.Y.—B  
 Allison Steel Mfg. Co., P.O. Box 6067, Phoenix, Ariz.—T  
 Alpha Erection Corp., Speer, Ill.—T  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—B  
 American National Video Productions, 17 N. Wabash Ave., Chicago 2, Ill.—F,U  
 Apex Recording Studios, 119 W. 57 St., New York 19, N.Y.—O  
 Arizona Recording Productions, 834 N. 7 Ave., Phoenix, Ariz.—O

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 Electronic Eng'g. Co., 362 W. Bowery St., Akron 7, Ohio.—B,AA,AB,AD  
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 Electro Vision, 30-16 Crescent St., Long Island City 2, N.Y.—B,O  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—B  
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 Empire State Labs., 2608 Merrick Rd., Bellmore, L.I., N.Y.—B  
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 Fairbanks, Jerry Inc., 6052 Sunset Blvd., Hollywood 28, Calif.—F  
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**FAIRCHILD RECORDING EQUIP. CORP.**, 154 St. & 7 Ave., Whitestone, N.Y.—S  
 Feiler Eng'g. & Mfg. Co., 8026 No. Monticello Ave., Skokie, Ill.—B  
 Ficker Recording Service, Old Greenwich, Conn.—O  
 Filmack Corp., 1327 S. Wabash Ave., Chicago 5, Ill.—O  
 Film Associates, 440 E. Schantz Ave., Dayton 9, Ohio—O  
 Filmcraft Productions, 8451 Melrose Ave., Los Angeles 46, Calif.—F  
 Film Makers, Inc., 322 E. 24 St., New York 10, N.Y.—F,U  
 Film Production Co., 4510 Excelsior Blvd., Minneapolis, Minn.—F  
 Film Research Associates, 150 E. 52 St., New York 22, N.Y.—G,J  
 Films for Industry, Inc., 135 W. 52 St., New York 19, N.Y.—F  
 Finney Productions, Edward F., 6525 Sunset Blvd., Hollywood 28, Calif.—F  
 Flory Films Inc., 205 Weymouth Dr., Rochester 10, N.Y.—F  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—B  
 Fulton Recording Co., 80 W. 40 St., New York 18, N.Y.—O  
 Gale Dorothea Mechanisms, 81-01 Broadway, Elmhurst, L.I., N.Y.—W  
**GATES RADIO CO.**, 123 Hampshire St., Quincy, Ill.—B  
 General Communications, P.O. Box 169, Fort Atkinson, Wisc.—B  
 General Picture Productions, Inc., 621 6 Ave., Des Moines 9, Iowa—O  
 Goldwyn Productions, Samuel, Studio Div., 1041 N. Formosa Ave., Los Angeles 46, Calif.—F  
 Good News Productions, Chester Springs, Pa.—F  
 Gotham Recording Corp., 2 W. 46 St., New York 36, N.Y.—O  
 Gray-O-Reilly Studios, 480 Lexington Ave., New York 17, N.Y.—F  
**GRAY RESEARCH & DEVEL. CO.**, 658 Hilliard St., Manchester, Conn.—P,Q  
 Greibach Research & Devel. Labs., 80 Pryer Terrace, New Rochelle, N.Y.—B  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—O  
 Handy Organization, Jam. 2821 E. Grand Blvd., Detroit 11, Mich.—B,F,G,K,L,P,Q,R,V,W,X,Y  
 Hartley Productions Inc., 20 W. 47 St., New York 36, N.Y.—F  
**HERMETIC SEAL PRODUCTS CO.**, 33 S. 6 St., Newark 7, N.J.—S  
 Hinde & Dauch, Sandusky, Ohio.  
 Hoffman Co., Michael, 489 5 Ave., New York 17, N.Y.—O,P  
 Hughey & Phillips, P.O. Box 686, Encino, Calif.—T  
 Hveo Television Film Co., 60 W. 46 St., New York, N.Y.—F  
 Industrial Film Labs., 3333 Iowa Ave., New York 19, N.Y.—F  
 International Research Corp., 2221 Warwick Ave., Santa Monica, Calif.—B  
 Int'l TV Film Productions, 331 Madison Ave., New York, N.Y.—F  
 Interstate TV Corp., 4376 Sunset Dr., Hollywood, Calif.—F  
 Ivanhoe Electronics Labs., 14238 S. LaSalle St., Chicago 27, Ill.—H  
 Karp Metal Products Co., 211 63 St., Brooklyn 20, N.Y.—E  
 King Enterprises, Inc., John Reed, 55 W. 53 St., New York 19, N.Y.—F  
 Kling Studio Inc., 601 N. Fairbanks St., Chicago 11, Ill.—F  
 Knickerbocker Production, Inc., 1600 Broadway, New York 19, N.Y.—F  
 Korb Eng'g. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—D,O  
 Lavin Associates, Henry, P.O. Box 196, Meriden, Conn.—B  
 Lewis Associates, Lester, 11 E. 48 St., New York 17, N.Y.—F  
 Libra Film Producers, 6525 Sunset Blvd., Hollywood, Calif.—F  
 Lifetone Transcriptions, 3 Gilbert Court, Peoria 5, Ill.—O  
 Lippa Co., Edwin A., 5485 W. Washington Blvd., Los Angeles 16, Calif.—O  
 Loucke & Norling, 245 W. 55 St., New York 19, N.Y.—F  
 Lynmar Associates, 1432 N. Carlisle St. Phila. 21, Pa.—B  
 McLarty Picture Productions, 45 Stanley St., Buffalo 6, N.Y.—F  
 Magnetic Recorder & Reproducer Corp., 241 N. 17 St., Philadelphia 3, Pa.—A,K,P,Y  
 March of Time, 369 Lexington Ave., New York 17, N.Y.—F  
 Mauer Inc., J. A., 37-01 31 St., Long Island City 1, N.Y.—O,P  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—A,B,F,P,R,U,Y  
 MGM Studios, 10202 Washington Blvd., Culver City, Calif.—F  
 Miller Electric Co., P.O. Box 1837, Jacksonville, Fla.—T  
 Modern Recording Studio, 55 W. Wacker Dr., Chicago 1, Ill.—F,O  
 Monogram Productions Inc., 4376 Sunset Dr., Hollywood 27, Calif.—F  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—B  
 Morton TV Productions, 360 N. Michigan Ave., Chicago 1, Ill.—F  
 Motion Picture Productions, Inc., 620 W. Superior Ave., Cleveland 13, Ohio—F  
 Movietone, Inc., 460 W. 54 St., New York 19, N.Y.—F  
 Musicolor, Inc., 840 N. Michigan Ave., Chicago, 11, Ill.—G,V  
 Mutual TV Production Inc., 9184 Sunset Blvd., Hollywood, Calif.—F  
 Nassour Studio, 5746 Sunset Blvd., Hollywood 28, Calif.—F  
 National Cine Equip., Inc., 209 W. 48 St., New York, N.Y.—R  
 Nemeth Studios, Ted., 729 7 Ave., New York 19, N.Y.—F  
 Newsreel for Telenews, 630 9 Ave., New York, N.Y.—F  
 Northwest Motion Pictures, 1716 30 Ave., W., Seattle 99, Wash.—F  
 Oberline Ltd., 6411 Hollywood Blvd. Hollywood 28, Calif.—A,B,O,P,U  
 Orleans & Assoc., Inc., Sam, 211 W. Cumberland Ave., Knoxville 15, Tenn.—F  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—B  
 Pacific Universal Products Corp., 168 Vista Ave., Pasadena 8, Calif.—N  
 Packaged Programs Inc., 634 Penn Ave., Pittsburgh 22, Pa.—U  
 Palmer Films Inc., W.A., 611 Howard St., San Francisco 5, Calif.—F  
 Paramount TV Production, Inc., 127 S. Broadway, Los Angeles 31, Calif.—F  
 Parsons Productions, Inc., Lindsley, 5746 Sunset Blvd., Hollywood 28, Calif.—F  
 Pathe Industries, Inc., 6823 Santa Monica Blvd., Hollywood 38, Calif.—F  
 P C A Electronics Inc., 2180 Colorado Ave., Santa Monica, Calif.—B  
 Phoenix Precision Instrument Co., 3803 N. 5 St., Philadelphia 40, Pa.—N  
 Photo-Art Commercial Studios, 420 S.W. Washington St., Portland 4, Ore.—F  
 Physical Research Associates, 1761 Lincoln Blvd., Santa Monica, Calif.—B  
 Poinsettia Co., 112 Cedar Ave. Pitman 15, N.J.—O  
 Polaris Pictures, Inc., 5859 W. 3 St., Los Angeles 36, Calif.—F  
 Popper & Sons, 300 4 Ave., New York 10, N.Y.  
 Precision Electronics, 7518 Melrose Ave., Los Angeles 46, Calif.—B  
 Precision Film Labs., 21 W. 46 St., New York 36, N.Y.—F  
 Precision Products 719 7 St., N.W., Washington, D.C.—N  
 Princeton Film Center, Carter Rd., Princeton, N.J.—F  
 Pulse Techniques, Inc., 1411 Palisade Ave., West Englewood, N.J.—B  
**RADIO CORP. OF AMERICA**, R C A VICTOR DIV., Front & Cooper St., Camden 2, N.J.—Z  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—O,P,Q,R,U,Y  
 Ram Productions, 661 West End Ave., New York 25, N.Y.—A,F,U,Y  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—B,C,G,O  
 Recorded Publications Labs., 1558 Pierce Ave., Camden 5, N.J.—R  
 Recording Associates, 14 Hillcrest Rd., E. Hartford 8, Conn.—R  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—N  
**REEVES SOUNDCRAFT CORP.**, 10 E. 52 St., New York 22, N.Y.—C,D  
 Regal TV Pictures Corp., 151 W. 46 St., New York 36, N.Y.—F  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—B  
 Republic Productions Inc., 4024 Radford Ave., N. Hollywood, Calif.—F  
 Republic Radio & TV Features, 64 E. Lake St., Chicago, Ill.—F  
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 Riethof Productions, Inc., 59 E. 79 St., New York, N.Y.—A,C,F,G,P,U  
 RKO-Pathe, Inc., 105 E. 106 St., New York, N.Y.—F  
 Roach Studios, Inc., Hal, 8822 Washington Blvd., Culver City, Calif.—F  
 Robinson Recording Labs., 35 S. 9 St., Philadelphia 7, Pa.—O,P,Q,R,Y  
 Rolab Studios, Walnut Tree Hill, Sandy Hook, Conn.—A,C,F,G,N,O,P,Q,R,U,V,W,X,Y  
 Ross Roy, Inc., 2751 E. Jefferson St., Detroit 7, Mich.—O  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—B  
 Rust Industrial Co., 608 Willow St., Manchester, N.H.—B  
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 Seaboard Studios, Inc., 157 E. 69 St., New York 21, N.Y.—F,O,R  
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 Shrader Mfg. Co., 2803 M. St., N.W., Washington 7, D.C.—B  
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 Smith-Meeker Eng'g. Co., 157 Chambers St., New York 7, N.Y.—B  
 S.O.S. Cinema Supply Corp., 602 W. 52 St., New York 19, N.Y.—C,E  
 Sound Masters Inc., 165 W. 46 St., New York 36, N.Y.—C,F,O  
 Spaeth, Sigmund, 400 E. 58 St., New York 22, N.Y.—F,U  
 Speak-O-Phone Recording & Equip. Co., 23 W. 60 St., New York, N.Y.—O  
 Special Effects & Equip. Inc., 418 W. 54 St., New York 19, N.Y.—B,F,G,J,R,U,V,W,X  
 Specialty TV Films Inc., 1501 Broadway, New York 36, N.Y.—F,U  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—B  
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 Telecast Film Inc., 112 W. 48 St., New York 36, N.Y.—F  
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 Telefilm, Inc., 6039 Hollywood Blvd., Hollywood, Calif.—F  
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 Tower Construction Co., 1923 Geneva St., Sioux City 3, Iowa.—T  
 Tower Productions, 1540 N. Highland Ave., Hollywood, Calif.—F  
 Tracerlab, Inc., 130 High St., Boston 10, Mass.—E  
 Transfilm, Inc., 35 W. 45 St., New York 19, N.Y.—F  
 Trans-Lux Corp., 1270 Ave. of the Americas, New York 20, N.Y.—X  
 Trilsch Co., John D., 1310 McKinney Ave., Houston, Texas.—T  
 TV Center, Inc., 42 & Lexington Ave., New York, N.Y.—F  
 TV Associated Productions, 4860 Valley Blvd., Los Angeles 32, Calif.—F,U  
 TV Guild Productions, Inc., 210 N. Larchmont Blvd., Los Angeles 4, Calif.—F  
 TV Screen Productions, 17 E. 45 St., New York 17, N.Y.—F  
 20th Century Fox Film Corp., 444 W. 56 St., New York 19, N.Y.—F  
 United Artists TV Corp., 729 7 Ave., New York 19, N.Y.—F  
 United Recording Labs., 1650 Broadway, New York 19, N.Y.—O  
 U.S. Recording Co. 1121 Vermont Ave., N.W., Washington 5, D.C.—B,F,G,P,Q,R,S,Y  
 U.S. Tower Co., 219 Union Trust Bldg., Petersburg, Va.—T  
 United World Films, 445 Park Ave., New York, N.Y.—F  
 Unity TV Corp., 1501 Broadway, New York 36, N.Y.—F  
 Universal-International, Lankershim Blvd., Universal City, Calif.—F  
 Universal Recorders, Inc., 6757 Hollywood Blvd., Hollywood 28, Calif.—O  
 Universal Recording Co., 140 W. 57 St., New York 19, N.Y.—O  
 Valentino, Inc., Thomas J. 150 W. 46 St., New York 36, N.Y.—B,H,L,O,P,Q,W,AA,AB  
 Video Drama Productions, 505 5 Ave., New York, N.Y.—F  
 Video Films, 1004 E. Jefferson Ave., Detroit 7, Mich.—F  
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 Vogue Wright Studios, 237 E. Ontario St., Chicago 11, Ill.—F  
 Walker Electric Co., B., 132 Nassau St., New York 7, N.Y.—B,H  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—H  
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 Western Instrument Co., 826 N. Victory Blvd., Burbank, Calif.

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 Westrex Corp., 111 8 Ave., New York 11, N.Y.—O  
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 William Productions, Inc., 1041 N. Formosa Ave., Hollywood 46, Calif.—F  
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 Williams Recording Service, Ash, 133 W. 16 St., Lincoln 8, Nebr.—O  
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 Wind Turbine Co., E. Market St. & Penn. R.R., West Chester, Pa.—T  
 Woodruff Assoc., 210 41 St., New York 17, N.Y.—C,F,X  
 Ziv TV Programs, 488 Madison Ave., New York 22, N.Y.—F



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 Helder Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J.—C,D,F,G,H  
 HERMASEAL CO., 1101 Lafayette St., Elkhart, Ind.—C  
 HERMETIC SEAL PRODUCTS CO., 33 S. 6 St., Newark 7, N.J.—C,D  
 Houghton Labs. Inc., 322 Bush St., Olean, N.Y.—C  
 Hull & Co., R. O., 1300 Parsons Ct., Rocky River, Ohio—D,F  
 Ideco Division, Dresser Stacey Co., 875 Michigan Ave., Columbus 15, Ohio—B  
 Industrial Electronic Engr's., 3973 Lankershim Blvd., N. Hollywood, Calif.—B  
 Int'l. Business Machines Corp., 50 Broadway, New York, N.Y.—J  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—H  
 Johnson Eng'g. Co., Welton V., 95 Summit Ave., Summit, N.J.—D  
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 Keller Products Co., 41 Union St., Manchester, N.H.—B  
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 Lynn Electronic Research Co., 9 W. Magnolia, Burbank, Calif.—H  
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 Nestor Eng'g. Co., 24 Chestnut St., Rutherford, N.J.—A  
 New Hermes Engravers, 13 University Pl., New York 3, N.Y.—I  
 Pacific Mercury Research Center, 1500 Mission Canyon Rd., Santa Barbara, Calif.—B  
 PHILCO CORP., Gov't. & Industrial Div., 4700 Wissahickon Ave., Philadelphia 44, Penna.—B  
 Photo Chemical Products, 479 Walton Ave., New York 51, N.Y.—D  
 Poinsettia Co., 112 Cedar Ave., Pitman 15, N.J.—D,F  
 Polymer Corp., 126 N. 5 St., Reading, Pa.—I  
 Precision Plastic Products, 225 N. Racine St., Chicago 6, Ill.—I  
 PRINTLOID, INC., 93 Mercer St., New York, N.Y.—I  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—M  
 Railway Communications Inc., Raytown, Mo.—A  
 Remco Mfg. Co., 545 N. La Salle St., Chicago 10, Ill.—G  
 Research Instrument Co., 233 Broadway, New York 7, N.Y.—B  
 Rigidized Metals Corp., 658 Ohio St., Buffalo 3, N.Y.—D  
 Sealtron Co., 9705 Reading Rd., Cincinnati 15, Ohio—C,F,G,H  
 Scientific Electronic Labs., 866 Bergen St., Newark 8, N.J.—C  
 Sears Co., M. J., 52 Clark St., Brooklyn 22, N.Y.—F  
 Shaw Insulator Co., 160 Coit St., Irvington, N.J.—I  
 Sillocks-Miller, Maplewood, N.J.—I

Spera Electronics Labs., 37-10 33 St., Long Island City, N.Y.—A,B  
 Sperry Products Inc., Shelter Rock Rd., Danbury, Conn.—B  
 Sperti Faraday Inc., 1077 Celestial St., Cincinnati 2, Ohio—C  
 Spincraft Inc., 4122 W. State St., Milwaukee 8, Wisc.—D  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—B  
 Stratoseal Mfg. Co., 3039 W. Fullerton Ave., Chicago 47, Ill.—C  
 Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.—F  
 Superior Flux & Mfg. Co., 1302 Ontario St., Cleveland 13, Ohio—G  
 Technical Operations, Inc., 6 Schouler Court, Arlington 74, Mass.—B  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—C,F  
 Telectronics Lab., 54 Kinkel St., Westbury, L.I., N.Y.—B  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—C  
 Tenney Eng'g. Inc., 26 Ave. B., Newark 5, N.J.—G  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—B  
 Torngren Co., C. W., 236 Pearl St., Somerville, Mass.—D  
 Torwico Electronics, Inc., 967 Frelinghuysen Ave., Newark 5, N.J.  
 Tricraft Products Co., 1535 N. Ashland Ave., Chicago 22, Ill.—H  
 Trilsch Co., John D., 1310 McKinney Ave., Houston, Texas—B  
 U. S. Tower Co., 219 Union Trust Bldg., Petersburg, Va.—B  
 UNIVERSAL AVIATION EQUIP., 187 Lafayette St., New York 17, N.Y.—I  
 Valentino, Inc., Thomas J., 150 W. 46 St., New York 36, N.Y.—F  
 Walker Electric Co., B., 132 Nassau St., New York 7, N.Y.—A,B  
 Wind Turbine Co., E. Market St. & Penn. R.R., West Chester, Pa.—B  
 Wright-Hepp Associates, 138 West St., S. Hackensack, N.J.—D  
 Wyeth Eng'g., 6021 Dempster St., Morton Grove, Ill.—B  
 Yellow Springs Instrument Co., P. O. Box 106, Yellow Springs, Ohio—B

## 80—SERVICES, INDUSTRIAL

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 Computer computation service . . . . .J  
 Construction . . . . .B  
 Hermetic sealing . . . . .C  
 Metal finishing . . . . .D  
 Optical repairs . . . . .E  
 Plating . . . . .F  
 Tinning . . . . .G  
 Treating, fungus & moisture proof . . . . .H  
 Marking &/or Engraving . . . . .I

Acme Scientific Co., 1450 W. Randolph St., Chicago 7, Ill.—F  
 Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—B,C  
 Airfyte Electronics Co., 21 Cottage St., Bayonne, N.J.—C  
 Allied Engraving & Stamping Co., 161 Ellicott St., Buffalo 3, N.Y.—D  
 Allied Research & Eng'g. Inc., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—F  
 Alpha Erection Corp., Sper, Ill.—A  
 American Communications Corp., 306 Broadway, New York 7, N.Y.—A  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—D,F  
 Anchor Metal Co., 244 Boerum St., Brooklyn 6, N.Y.—C,G  
 Applied Science Corp., P. O. Box 44, Princeton, N.J.—D  
 Apollo Metal Works, 66 Pl. & S. Oak Park Ave., Chicago 38, Ill.—D  
 Arenberg Ultrasonic Lab., 94 Green St. Jamaica Plain 30, Mass.—C  
 Art Roll Leaf Stamping, 4201 Hudson Blvd., N. Bergen, N.J.—I  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—B  
 Austin Co., 76 9 Ave., New York 11, N.Y.—B  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—B  
 Bart Labs., 227 Main St., Belleville 9, N.J.—D  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—B  
 Buck Eng'g. Co., 37 Marcy St., Freehold, N.J.—B,D  
 BURROUGHS ADDING MACHINE CO., 511 N. Broad St., Philadelphia 23, Pa.—J  
 Calbest Eng'g. & Electronics Co., 823 N. Highland Ave., Hollywood 38, Calif.—G  
 Calresin Corp., 333 N. Santa Anita Ave., Arcadia, Calif.—C  
 Cameron Craft, 942 Brockhurst St., Oakland 8, Calif.—D  
 Computer Corp. of America, 149 Church St., New York 7, N.Y.—B  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—D,F,G,H  
 Consolidated Productions Inc., Bldg. 9, Broward Int'l. Airport, Ft. Lauderdale, Fla.—G,H  
 Consolidated Vacuum Corp., 735 Ridge Rd., W. Rochester 3, N.Y.—C,D  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—B  
 Eastern Heat Treating & Brazing Corp., 250 W. 54 St., New York 19, N.Y.—D  
 Egan Lab., 107-56 113 St., Richmond Hill 19, N.Y.—B  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—B  
 ELECTRICAL INDUSTRIES, Div. Ampere Electric Corp., 44 Summer Ave., Newark 4, N.J.—C,F  
 ELECTRICAL TOWER SERVICE, P. O. Box 1205, Peoria, Ill.—A  
 Electrochemical Industries, Jacques St., Worcester 3, Mass.—D,F,G  
 Electronic Eng'g. Co., 362 W. Bowery St., Akron 7, Ohio—A,B,D  
 Electronic Products Co., Box 450, Red Bank, N.J.—H  
 Electro-Seal Corp., 946 North Ave., Des Plaines, Ill.—C  
 Ellis Associates, Box 77, Pelham, N.Y.—B  
 Eng'g. Research Associates, Div. Remington Rand Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—J  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,B  
 FUSITE CORP., 6000 Fernview Ave., Cincinnati 13, Ohio—C

## 81—SOUND REPRODUCING EQUIPMENT, DISC

Filters, needle scratch . . . . .A  
 Microscopes . . . . .B  
 Needles . . . . .C  
 Pickup arms . . . . .D  
 Phonographs, electric . . . . .E  
 Phonographs, hand-wound . . . . .F  
 Phonographs, radio combinations . . . . .G  
 Pickups, crystal . . . . .H  
 Pickups, dynamic . . . . .I  
 Pickups, magnetic . . . . .J  
 Pickups, photoelectric . . . . .K  
 Pickups, reluctance . . . . .L  
 Record changers, automatic . . . . .M  
 Record compounds . . . . .Y  
 Record Players, coin-operated . . . . .N  
 Record Players, home . . . . .O  
 Record Players, transcription . . . . .P  
 Record Racks . . . . .Q  
 Record Presses . . . . .R  
 Records, commercial . . . . .S  
 Records, frequency . . . . .T  
 Records, home . . . . .U  
 Records, sound effects . . . . .V  
 Transcriptions, broadcast . . . . .W  
 Turntables . . . . .X

Airtronix Development Corp., 20 W. 22nd St., New York 10, N.Y.—E,G,M,O,P  
 Alliance Mfg., Co., Lake Park Blvd., Alliance, Ohio—X  
 American Laubscher Corp., 333 W. 52 St., New York 19, N.Y.—C  
 American Microphone Co., 370 S. Fair Oaks Ave., Pasadena 1, Calif.—D,H  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—C  
 Ansley Mfg. Co., Arthur, Doylestown, Pa.—E,G  
 Astatic Corp., 250 Harbor St., Conneaut, Ohio—D,H  
 Audak Co., 500 5 Ave., New York 36, N.Y.—J  
 AUDIO DEVICES INC., 444 Madison Ave., New York 22, N.Y.—C  
 Audio Industries, Inc., 532 W. Fourth St., Michigan City, Ind.—E,G  
 Audio Master Corp., 341 Madison Ave., New York, N.Y.—E,G,M,O,P,V,X  
 Audio-TONE Oscillator Co., 6511 Main St., Long Hill, Conn.—T  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—A,C,D,E,H,I,J,L,M,P  
 Autocrat Electronics Co., 5024 Elm St., Skokie 8, Ill.—E,M,U  
 Automatic Radio Mfg., Co., 122 Brookline Ave., Boston 15, Mass.—G

Bausch & Lomb Optical Co., 628 St. Paul St., Rochester, N.Y.—B  
 Beam Radionics Corp., 224 N. Desplains St., Chicago 6, Ill.—E,O  
 Bell Sound Systems, 555 Marion Rd., Columbus, Ohio—E,O,P  
 Bogen Co., David, 29 Ninth Ave., New York 14, N.Y.—H,O,P  
 Boulevard Recording Studio, 25 E. Jackson Blvd., Chicago 4, Ill.—S,U,V,W  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—D,E,F,O,P  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—A,C,D,H,I,J  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—D,M,X  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—D,E,F,G,H,I,J,L,M  
 Bucks County Enterprises, Quakertown, Pa.—Q  
 BUD RADIO INC., 2118 E. 55 St., Cleveland 3, Ohio—O  
 Buhl Optical Co., 1009 Beech Ave., Pittsburgh 12, Pa.—B  
 Calbest Eng'g. & Electronics, 828 N. Highland Ave., Hollywood 38, Calif.—O  
 Califone Corp., 1041 N. Sycamore St., Hollywood 38, Calif.—E,O,P,X  
 Caltron Products Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.—C,D,J  
 Calvin Co., 1105 Truman Rd., Kansas City 6, Mo.—E  
 Capitol Records, 5515 Melrose Ave., Hollywood 38, Calif.—S,U,W  
 Castlewood Mfg., Co., 1430 S. 12 St., Louisville 10, Ky.—G  
 Central Electronics Corp., 4875 San Fernando Rd. W., Los Angeles 39, Calif.—E  
 Columbia Records, Inc., 1473 Barnum Ave., Bridgeport 8, Conn.—C,U,W  
 Cook Labs., Inc., 114 Manhattan St., Stamford, Conn.—T,U,V  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—C,D,E,F,H,I,J,K,L,M,X  
 Crescent Industries, 5900 W. Touhy Ave., Chicago 31, Ill.—E,M,O  
 Culbertson Cp., George K., 8471 Leroy St., San Gabriel, Calif.—E,O  
 Dallons Labs., 5066 Santa Monica Blvd., Los Angeles 29, Calif.—H  
 Dean Electronics, 35 5 Ave., Brooklyn 17, N.Y.—E,F,O,P  
 Decca Records, Inc., 50 W. 57 St., New York, N.Y.—U  
 Dela. Optical Labs. 36 Williams St., Lansdowne, Pa.—K  
 Doelcam Corp., 56 Elmwood St., Newton 58, Mass.—X  
 DuKane Corp., St. Charles, Ill.—P  
 Edu-Craft Sales Corp., 150-45 12 Ave., White-stone, N.Y.—E,G,O  
 Electron Enterprises, 6917 W. Stanley Ave., Berwyn, Ill.—E,O,P  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—K  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—K  
 Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.  
 Electro-Voice, Inc., Cecil and Carroll Sts., Buchanan, Mich.—D, H  
 Elex Co., 69-19 215 St., Bayside 64, N.Y.—E,F,G  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7 Ave., Whitestone, N.Y.—C,D,I,J,P,X  
 Federal Sapphire Products, 12 River Rd., Fair Lawn, N.J.—C  
 Ferranti Electric, 30 Rockefeller Plaza, New York 20, N.Y.—D,J  
 Fidelity Amplifier Co., 703 W. Willow St., Chicago 14, Ill.—O  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—E,G,O  
 Frutcher, M.P., P. O. Box 28, Hackettstown, N.J.—I,J,L  
 Gale Dorothea Mecbanisms, 81-01 Broadway, Elmhurst, L.I., N.Y.—E,M,X

GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—V,X  
 GENERAL ELECTRIC CO., APPARATUS DIV., 1 River Rd., Schenectady 5, N.Y.—J  
 GENERAL ELECTRIC CO., Radio-TV Dept., Electronics Park, Syracuse, N.Y.—A.C.D.L  
 GENERAL INDUSTRIES CO., Olive & Taylor Sts., Elyria, Ohio—C,E,F,X  
 General Instrument Corp., 829 Newark Ave., Elizabeth 2, N.J.—M  
 GRAY RESEARCH & DEVEL. CO., 658 Hilliard St., Manchester, Conn.—D  
 Greene Co., L. Charlton, 314 Washington St., Newton 58, Mass.—E  
 GULTON MFG. CORP., 212 Duryham Ave., Metuchen, N.J.—H  
 Hamilton Electronics Corp., 2726 Pratt Ave., Chicago 45, Ill.—E,X  
 Hedco Mfg. Corp., 161 W. Huron St., Chicago 10, Ill.—E,G,M  
 Jensen Industries, 329 S. Wood St., Chicago 12, Ill.—C  
 Int'l. Projector Corp., 55 La France Ave., Bloomfield, N.J.—K  
 Key Electronics Corp., 20 W. 22 St., New York 10, N.Y.—E,G,M  
 Life Record Co., 64 W. Randolph St., Chicago, Ill.—E  
 Lindberg Instrument, Alamo Downs, Culebra Rd., San Antonio 4, Texas  
 Lipps Co., Edwin A., 5485 W. Washington Blvd., Los Angeles 16, Calif.—C  
 Logistics Research Inc., 141 S. Pacific Ave., Redondo Beach, Calif.—K  
 London Records, 539 W. 25 St., New York 1, N.Y.—U  
 Lovins Eng'g. Co., 8203 Cedar St., Silver Spring, Md.—B  
 McClure Talking Pictures, O.J., 1115 W. Wash- ington Blvd., Chicago 7, Ill.—E,P  
 MCM Records, 701 7 Ave., New York 36, N.Y.—U  
 Magna Electronics Inc., 9810 Anza Blvd., Inglewood, Calif.—E,O,P  
 Major Electronics Co., 1090 Bedford Ave., Brooklyn, N.Y.—E  
 Mfg. Lab., 10610 Keswick, Sun Valley, Calif.—D  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—E,G,O  
 Markel Electric Products, 129 Seneca St., Buffalo 3, N.Y.—M,O  
 MELPAR, INC., 452 Swann Ave., Alexandria, Va.—J  
 Mercury Record Corp., 839 S. Wabash Ave., Chicago, Ill.—U  
 Miller Co., J.W., 5917 S. Main St., Los Angeles 3, Calif.—A  
 Miller Mfg. Co., M.A., 4 & Church Sts., Libertyville, Ill.—A,C  
 Milwaukee Record Changer Corp., 39 Warren St., New York 7, N.Y.—M  
 Milwaukee Stamping Co., 300 S. 72 St., Milwaukee 14, Wisc.—M  
 Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago 14, Ill.—E  
 MP Engineering Co., Fairfield 3, Conn.—E,G, O,P  
 Newcomb Audio Products, 6824 Lexington Ave., Hollywood 38, Calif.—E,O,P,W  
 Optron Mfg. Co., 3223 N. Sheffield Ave., Chicago 13, Ill.—D,E,M  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—A  
 Pacific Transducer Corp., 11921 W. Pico Blvd., Los Angeles 64, Calif.—B,C,D,J,L,T  
 Peerless TV Radio Co., 6508 Euclid Ave., Cleveland, Ohio—E,G  
 Pentron Corp., 221 E. Cullerton Ave., Chicago 16, Ill.—E,G,M  
 Permo, Inc., 6415 N. Ravenswood Ave., Chicago 26, Ill.—C  
 Pfanstiehl Chemical Co., 104 Lake View Ave., Waukegan, Ill.—C,D  
 Phila. Scientific Glass Co., 4 Eckard Ave., Abington, Penna.—W  
 Pickering & Co., 309 Woods Ave., Oceanside, N.Y.—D,J,X  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—O  
 Pointsettia Co., 112 Cedar Ave., Pitman 15, N.J.—R  
 Precision Electronics, 7518 Melrose Ave., Los Angeles 46, Calif.—E,G  
 Precision Supply & Machine Co., 12-36 River Rd., Fairlawn, N.J.—C  
 PRESTO RECORDING CORP., P. O. Box 500, Paramus, N.J.—B,C,J,P,X  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., Front & Cooper Sts., Camden 2, N.J.—B,I,J,X  
 Radio Music Corp., 84 S. Water St., Port Chester, N.Y.—D,J,L,P,X  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—E,G,M,O,P,S,T,W  
 Recoton Corp., 147 W. 22nd St., New York 11, N.Y.—C,J  
 Reevesound Co., 35-53 36 St., Long Island City 1, N.Y.—B  
 REEVES SOUNDCRAFT CORP., 10 E. 52 St., New York 22, N.Y.—C,S  
 Rek-O-Kut Co., 38-01 Queens Blvd., Long Island City 1, N.Y.—E,O,P,X  
 Remington Records, 551 5 Ave., New York, N.Y.—U  
 Robinson Recording Labs., 35 S. 9 St., Philadel- phia 7, Pa.—D,P,S,U,W,X  
 Rolab Studios, Walnut Tree Hill, Sandy Hook, Conn.—S,U,V

Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—A  
 Seeburg Corp., J. P., 1510 N. Dayton St., Chi- cago 22, Ill.—N  
 Shura-tone Products, 440 Adelphi St., Brook- lyn 38, N.Y.—E,G,O  
 SHURE BROS., INC., 225 W. Huron St., Chi- cago 10, Ill.—D,H  
 Simpson Mfg. Co., Mark, 32-28 49 St., Long Island City 3, N.Y.—E,P  
 Sonotone Corp., Elmsford, N.Y.  
 Sparton Radio TV, 2400 E. Ganson St., Jack- son, Mich.—G,O  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—X  
 Steelman Phono. & Radio Co., 12 Anderson Ave., Mount Vernon, N.Y.—E,G,O,P  
 Stokes Machine Co., F.J., 5500 Tabor Rd., Phil- adelphia 20, Pa.—R  
 Stromberg-Carlson Co., Rochester 3, N.Y.—M  
 Symphonic Radio & Electronic Corp., 160 Washington St. N., Boston 14, Mass.—N,O,P  
 Talking Devices Co., 4447 Irving Park Rd., Chicago 41, Ill.—E,F,M,P,R,S,U  
 Tech Labs., Inc., 120 Hillcrest Ave., Leonia, N.J.—V  
 Televex Co., 217 Riverdale Ave., Yonkers, N.Y.—B,C  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—J  
 Tetrad Co., 62 St. Mary St., Yonkers, N.Y.—B,C,D  
 Trebor Radio Co., Pasadena 18, Calif.—O  
 United Pressed Products, 741 W. Harrison St., Chicago 7, Ill.—A,C,E  
 U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—B,C,D,E,H,J,L,P,X  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—A  
 Universal Microphone Co., 424 Warren Lane, Inglewood, Calif.—T  
 Valentino Inc., Thomas J., 150 W. 46 St., New York 36, N.Y.—B,P,V,W  
 VM Corp., 280 Park St., Benton Harbor, Mich.—M  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—X  
 Weathers Industries, 66 E. Gloucester Pike, Barrington, N.J.—D  
 Webster-Chicago Corp., 5610 W. Bloomingdale Ave., Chicago 39, Ill.—E,M  
 Webster Electric Co., 1900 Clark St., Racine, Wisc.—H  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—E  
 White Industries, 421 W. 54 St., New York 19, N.Y.—E  
 White Rock Mfg. Co., White Rock, S. Car.—E, F,G,O  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—B,M,X

## 82—SOUND REPRODUCING EQUIPMENT, MAGNETIC

Heads, magnetic tape playback ... A  
 Heads, magnetic wire playback ... B  
 Players, magnetic tape ..... C  
 Players, magnetic wire ..... D  
 Tape indexes ..... E  
 Tape, magnetic ..... F  
 Wire, magnetic ..... G

AMPEX ELECTRIC CORP., 934 Charter St., Redwood City, Calif.—C  
 Ampro Corp., 2835 N. Western Ave., Chicago 18, Ill.—C,F  
 Audak Co., 500 5 Ave., New York 36, N. Y.—A  
 AUDIO DEVICES, INC., 444 Madison Ave., New York 22, N.Y.—F  
 Audio Master Corp., 341 Madison Ave., New York 17, N.Y.—C,F  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—A,C,F  
 Aurex Corp., 1117 N. Franklin St., Chicago 10, Ill.—D  
 Bell Sound Systems, 555 Marion Rd., Colum- bus, Ohio—C  
 Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.—A,C  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—C  
 Brush Electronics Co., 3405 Perkins Ave., Cleveland 14, Ohio—A,C,F  
 Caltron Products Co., 1406 S. Hobart Blvd., Los Angeles 6, Calif.—A  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—C,F  
 Cook Electric, 2700 Southport Ave., Chicago 14, Ill.—A  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,C,F  
 Crescent Industries, 5900 W. Touhy Ave., Chi- cago 31, Ill.—A,B,C,D  
 Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.—C  
 Electro-Mechanical Instrument Co., 812 Chest- nut St., Perkasio, Pa.—A,B  
 Electron Enterprises, 6917 W. Stanley Ave., Berwyn, Ill.—D

### EXCLUSIVE LIST of ELECTRONIC REPRESENTATIVES

This is the only list in any directory devoted exclusively to electronic representatives. Arranged alpha- betically according to states and cities, it gives the names and ad- dresses of all independent "reps" throughout the country. It is the most complete and authoritative representatives list ever published. See page 308.

**TELE-TECH**  
 & ELECTRONIC INDUSTRIES

Electronic Computer Corp., 265 Butler St., Brooklyn 17, N.Y.—A  
 Electrosonic Specialties, 7230 Clinton Rd., Upper Darby, Pa.—C,D  
 Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.—C  
 Federal Mfg. & Eng'g. Corp., 211 Steuben St., Brooklyn 5, N.Y.—C  
 Fidelitone, Inc., 1616 Devon Ave., Chicago 26, Ill.—F,G  
 Gale Dorothea Mechanisms, Inc., 81-01 Broadway, Elmhurst, Long Island, N.Y.—C  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—C,F,G  
 Hallen Corp., 3503 W. Olive Ave., Burbank, Calif.—A  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—C  
 Jensen Industries, 329 S. Wood St., Chicago 12, Ill.—F  
 Kinevox, 116 S. Hollywood W., Burbank, Cal.—C  
 Korb Engr. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—C,D,G  
 Land-Air, Inc., 440 W. Superior St., Chicago 10, Ill.—C,D,F,G  
 Lipps Co., Edwin A., 5485 W. Washington Blvd., Los Angeles 16, Calif.—A  
 Magnasync Mfg. Co., 5517 Satsuma Ave., N. Hollywood, Calif.—A  
 Magnecord Inc., 225 W. Ohio St., Chicago 10, Ill.—A,C  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—C,F  
 Marine View Electronics, 744 E. 138th St., New York 54, N.Y.—C,D  
 Michigan Electronics, Inc., 854 N. Rockwell St., Chicago 22, Ill.—C,D  
 Minn. Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.—E,F  
 Monson Corp., 919 N. Michigan Ave., Chicago 11, Ill.—F  
 Orradio Industries, Inc., T-120 Marvyn Rd., Opelika, Ala.—F  
 Pentron Corp., 221 E. Cullerton Ave., Chicago 16, Ill.—A,C,F,G  
 Permo, Inc., 6415 N. Ravenswood Ave., Chicago 26, Ill.—F,G  
 Pfanstiehl Chemical Co., 104 Lake View Ave., Waukegan, Ill.—F  
 PRESTO RECORDING CORP., P. O. Box 500, Paramus, N.J.—A  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., Camden 2, N.J.—A  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—F  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—A  
 Recoton Corp., 147 W. 22 St., New York 11, N.Y.—F  
 Reevesound Co., 35-54 36 St., Long Island City 1, N.Y.—A  
 REEVES SOUND-CRAFT CORP., 10 E. 52 St., New York 22, N.Y.—F  
 Shoup Engineering Co., 221 E. Cullerton St., Chicago 16, Ill.—A,C  
 SHURE BROTHERS, INC., 225 W. Huron St., Chicago 10, Ill.—A,B  
 Smith Associates, Raudon, 2217 M. St., N.W., Washington 1, D.C.—A,D  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—A,C  
 Techno Instrument Co., 6666 Lexington Ave., Los Angeles 38, Calif.—D  
 U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—A,C,F  
 Valentino Inc., Thomas J., 150 W. 46th St., New York 36, N.Y.—D,F  
 Webster-Chicago Corp., 5610 W. Bloomingdale Ave., Chicago 39, Ill.—F,G  
 Webster Electric Co., 1900 Clark St., Racine, Wisc.—C  
 Williams Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—C,F  
 White Industries Inc., 421 W. 54 St., New York 19, N.Y.—A



### 83—SOUND SYSTEMS, INTER-COMMUNICATORS & HEARING AIDS

Acoustic materials	.....A
Amplifiers, mobile	.....B
Amplifiers, power	.....C
Bells & buzzers	.....D
Carrier current systems	.....E
Consoles, studio	.....F
Controllers, remote	.....G
Equalizers	.....H
Hearing aids	.....I
Home sound systems	.....J
Intercommunicators	.....K
Megaphones, electronic	.....L
Musical electronic equipment	.....M
Preamplifiers	.....N
Public address systems	.....O
Telephone systems	.....P
Telephones, sound powered	.....Q

Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—E,H  
 Airtronix Devel. Corp., 20 W. 22 St., New York 10, N.Y.—K,N,O  
 Allied Int'l, Inc., 230 Park Ave., New York 17, N.Y.—C,G,N,O  
 Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Ill.—B,C,J,M,O  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—C,F,G,J,N,O  
 American Communications Corp., 306 Broadway, New York 7, N.Y.—E,K,O,P  
 Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—C,J,O  
 Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.—B  
 Approved Electronic Instrument Corp., 928 Broadway, New York 10, N.Y.—J,N  
 Atlantic Electronics Corp., 4 Manhasset Ave., Port Washington, N.Y.—C,N  
 Audio Equipment Co., 805 Middle Neck Rd., Great Neck, N.Y.—B,C,K,L,N,O  
 Audio-Master Corp., 341 Madison Ave., New York 17, N.Y.—O  
 Audio & Video Products Corp., 730 Fifth Ave., New York 19, N.Y.—C,F,H,J,N  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—I  
 Authorized Mfrs. Service, 153 Spencer St., Brooklyn 5, N.Y.—K  
 Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—E,K,P  
 Beam Instruments Corp., 350 Fifth Ave., New York 1, N.Y.—B,C,J,L,N,O,Q  
 Beam Radionics Corp., 224 N. Desplains St., Chicago 6, Ill.—K  
 Bell Sound Systems, 555 Marion Rd., Columbus 7, Ohio—B,C,J,K,M,N,O  
 Beltone Hearing Aid Co., 1450 W. 19 St., Chicago 8, Ill.—I  
 Bozen Co., David, 29 Ninth Ave., New York 14, N.Y.—B,C,G,I,J,K,N,O  
 Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—J,O  
 Brelco Electronics Corp., 55 Vandam St., New York 13, N.Y.—L  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—C,E,F,H  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—N  
 Brociner Electronics Lab., 1546 Second Ave., New York 28, N.Y.—C,H,N  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—E,O  
 Bunnell & Co., J.H., 81 Prospect St., Brooklyn 1, N.Y.—D  
 Calbest Eng'g. & Electronics Co., 828-830 N. Highland Ave., Hollywood 38, Calif.—C,J,K,L,N,O  
 Califone Corp., 1041 N. Sycamore Ave., Hollywood 38, Calif.—J,O  
 Carad Corp., 93 Leland Ave., San Francisco 28, Calif.—E  
 Castlewood Mfg. Co., 1430 S. 12 St., Louisville 10, Ky.—K  
 CBS-Columbia Inc., 170-53 St., Brooklyn 32, N.Y.—C,K,O  
 Century Projector Corp., 729 7 Ave., New York 19, N.Y.—O  
 C.G.S. Laboratories, Inc., 391 Ludlow St., Stamford, Conn.—G  
 CHICAGO TELEPHONE SUPPLY, 1142 W. Beardsley Ave., Elkhart, Ind.—H  
 CINEMA ENG'G. CO., DIV. AEROVOX CORP., 1510 W. Verdugo Ave., Burbank, Calif.—C,F,H,N  
 Clark Cooper Co., Palmyra, N.J.—D  
 Color Television Inc., 973 E. San Carlos Ave., San Carlos, Calif.—K

Colortone Television Co., 238 William St., New York 38, N.Y.—K  
 Cook Labs., Inc., 114 Manhattan St., Stamford, Conn.—N  
 Cooper Electronic Products Co., 4500 Melrose St., Philadelphia 24, Pa.—K  
 Communication Accessories Co., Hickman Mills, Mo.—E,H  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—D,K,P  
 CROSBY LABS., INC., Box 233, Robbins Lane, Hicksville, L.I., N.Y.—E  
 Crown Eng'g., 3821 Commercial N. E., Albuquerque, N.M.—N  
 Cunningham Son & Co., James, 13 Canal St., Rochester 8, N.Y.—Q  
 Curtiss Wright Corp., Electronics Div., 631 Central Ave., Carlstadt, N.J.—N  
 Daven, 191 Central, Newark 4, N.J.—H  
 Deagan, Inc., J.C., 1770 W. Berteau Ave., Chicago 13, Ill.—M  
 Dean Electronics, 35 5 Ave., Brooklyn 17, N.Y.—J,K,O  
 Denrad Mfg. Co., 310 W. Woodard St., Denison, Tex.—B,C,F,J,N,O  
 Detect-O-Ray Co., 2622 N. Halsted St., Chicago 14, Ill.—D  
 Dilks Co., Derby Ave., Seymour, Conn.—O  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—B,C,D,F,G,H,K,N,O  
 DuKane Corp., St. Charles, Ill.—C,K,N,O  
 Edu-Craft Sales Corp., 150-45 12 Ave., White-stone, N.Y.—C,J,N  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—B  
 Electronic Eng'g. Co., 362 W. Bowery St., Akron 7, Ohio—B,C,E,H,J,K,N,O,P  
 Electro Vision Lab., 30-16 Crescent St., Long Island City 2, N.Y.—O  
 Electro-Voice, Inc., Cecil and Carroll Sts., Buchanan, Mich.—A  
 Electronic Workshop, 361 Bleecker St., New York 14, N.Y.—J  
 Elex Co., 69-19 215 St., Bayside 64, N.Y.—B,K,L,O  
 Elm Labs., 18 S. Broadway, Dobbs Ferry, N.Y.—G,K  
 El-Tronics, Inc., 5 & Noble Sts., Phila. 23, Pa.—C,E,N,O  
 Erwood, Inc., 1770 W. Berteau Ave., Chicago 13, Ill.—N  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—B,C,E,F,H,J,K,L,N,O  
 Executone Inc., 415 Lexington Ave., New York 17, N.Y.—C,J,K,O  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7 Ave., Whitestone, N.Y.—C,H,N  
 Farmers Eng'g. & Mfg., Co., Irwin, Pa.—G,K  
 Federal Telephone & Radio Corp., 100 Kingsland Rd., Clifton, N.J.—E,P  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—B,C,E,G,J,K,N,O,P  
 Fidelity Amplifier Co., 703 W. Willow St., Chicago 14, Ill.—O  
 Fisher Radio Corp., 45-51 Van Dam St., Long Island City 1, N.Y.—C,I,N  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—B,C,E,F,J,K,N,O  
 Gables Eng'g. Inc., 247 Greco Ave., Coral Gables, Fla.—O  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—C,N  
 GAILBRAITH & SON, 450 6 Ave., New York 11, N.Y.—C,L,N,O  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—C,N,O  
 General Communications, Box 169, Fort Atkinson, Wisc.—C,F,J,K,N,O,P  
 GENERAL ELECTRIC CO., RADIO-TV DEPT., Syracuse, N.Y.—C,N  
 General Hermetic Sealing Corp., 99 E. Hawthorne Ave., Valley Stream, L.I., N.Y.—K  
 Godfrey Mfg., Co., 2642 S. Michigan Ave., Chicago 16, Ill.—K  
 GRAY RESEARCH & DEVEL. CO., 658 Hilliard St., Manchester, Conn.—H  
 Greene Co., L. Charlton, 314 Washington St., Newton 58, Mass.—K  
 Haller, Raymond & Brown, 124 N. Atherton St., State College, Pa.—G  
 Hamilton Electronics Corp., 2726 Pratt Ave., Chicago 45, Ill.—B,C,I,N,O  
 Harmon Electronics Co., 11341 Truman Rd., Independence, Mo.—E,K  
 Hedco Mfg., 161 W. Huron St., Chicago, Ill.—N,O  
 Inter-Communications Corp., 620 W. Douglas, Wichita 12, Kan.—G,J,K  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—B,C,F,G,H,J,N,O  
 Int'l Electronics Corp., 147 Parkhouse St., Dallas 2, Texas.—F,N  
 Int'l. Projector Corp., 55 LaFrance Ave., Bloomfield, N.J.—C,N,O  
 Int'l. Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—I  
 i.q. industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—G  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—C,I  
 KELLOGG SWITCHBOARD & SUPPLY, 79 W. Monroe St., Chicago 3, Ill.—D,P  
 KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—K  
 Key Electronics Corp., 20 W. 22 St., New York 10, N.Y.—J,O  
 Korb Eng'g. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—C,N  
 Lansing Sound Inc., James B., 2439 Fletcher Dr., Los Angeles 39, Calif.—J

### GEOGRAPHICAL LIST of DISTRIBUTORS

This is a complete interfiling of distributors—giving names of firms and addresses. This complete and accurate list of electronic distributors is arranged alphabetically under states and cities. See page 299.

**TELE-TECH**  
& ELECTRONIC INDUSTRIES

Loge, Sound Engineers, J.M., 2171 W. Washington Blvd., Los Angeles 18, Calif.—B,C,J,K,N,O  
 Loral Electronics Corp., 794 E. 140 St., New York 54, N.Y.—K  
 Lyman Electronic Corp., 12 Cass St., Springfield, Mass.—K  
 Lynch Carrier Systems, 96 Jessie St., San Francisco 5, Calif.—P  
 McClure Talking Pictures, O.J., 1115 W. Washington Blvd., Chicago 7, Ill.—O  
 Magna Electronics Inc., 9810 Anza Blvd., Inglewood, Calif.—B,C,J,M,N,O  
 MAGNAVOX CO., Fort Wayne 4, Ind.—C  
 Magnetic Recording Industries, 30 Broad St., New York 4, N.Y.—N  
 Maico Co., 21 N. 3 St., Minneapolis, Minn.—I  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—J,K,M,N,O  
 Melody Master Mfg., Co., 2106 Berwyn Ave., Chicago, Ill.—I,O  
 Michigan Electronics Inc., 854 N. Rockwell St., Chicago 22, Ill.—O,P  
 Microtone Co., Ford Parkway on the Miss., St. Paul, Minn.—I  
 Miles Reproducer Co., 812 Broadway, New York 3, N.Y.—B,C,N,O  
 Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 3, Pa.—K  
 Morrow Radio Mfg., Co., 2794 Market St., Salem, Ore.—B,C,I,J,K,N,O  
 Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill.—K  
 Myers & Sons, E. A., 306 Beverly Rd., Pittsburgh 16, Pa.—I  
 Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood, 38, Calif.—B,C,J,N,O  
 North Electric Mfg., Co., S. Market St., Galion, Ohio—P,Q  
 O'Brien Electric Corp., 6514 Santa Monica Blvd., Hollywood 38, Calif.—B,C,F,G,J,K,L,M,N,O  
 Optron Mfg. Co., 3223 N. Sheffield Ave., Chicago 13, Ill.—O  
 Orthon Corp., 196 Albion Ave., Paterson, N.Y.—C,K  
 Pacific Transducer Corp., 11921 W. Pico Blvd., Los Angeles 64, Calif.—H  
 Pentron Corp., 221 E. Cullerton Ave., Chicago 16, Ill.—N  
 Petroff, Peter A., 127 Water St., New York 5, N.Y.—G  
 Pfanstiehl Chemical Co., 104 Lake View Ave., Waukegan, Ill.—N  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—J  
 Pickering & Co., 309 Woods Ave., Oceanside, N.Y.—G,N  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—L  
 Plastics & Electronics, 272 Northland Ave., Buffalo 8, N.Y.—I,N  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—C  
 Precision Electronics, 7513 Melrose Ave., Los Angeles 46, Calif.—C,J,K,O,P  
 Precision Electronics, Inc., 9101 King Ave., Franklin Park, Ill.—B,C,J,N,O  
 Precision Hearing Aids, 5157 W. Grand Ave., Chicago 39, Ill.—H,I  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—C  
 Radar-Electronics Inc., 229 W. 28 St., New York 1, N.Y.—J  
 RADIO CORP. OF AMERICA, RCA VICTOR DIV., Front & Cooper St., Camden 2, N.J.—B  
 Radio Kits, Inc., 120 Cedar St., New York 6, N.Y.—C,N,O  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—N  
 Radio Music Corp., 84 S. Water St., Port Chester, N.Y.—C,F,N  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—J,O  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—N  
 Rauland-Borg Corp., 3515 W. Addison St., Chicago 18, Ill.—B,J,K,N,O  
 REEVESOUND CO., 35-54 36 St., Long Island City 1, N.Y.—F  
 Rek-O-Kut Co., 38-01 Queens Blvd., Long Island City 1, N.Y.—O  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—L,O  
 Rich Electronics, 212 N.W. 8 Ave., Miami 36, Fla.—C  
 Rigidized Metals Corp., 658 Ohio St., Buffalo 3, N.Y.—A  
 Ripley Co., Middletown, Conn.—C  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—J,K,O,P,Q  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio—C,M,N  
 Scott, Inc., Hermon Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—C,H,J,N  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—C  
 Sears Co., 52 Clark St., B'klyn 2, N.Y.—P,Q  
 Shevers, Inc., Harold, 123 W. 64 St., New York 23, N.Y.—J  
 Shrader Mfg., Co., 2803 M. St., N.W., Washington 7, D.C.—C,F,J,K,N,O,P  
 Simpson Mfg., Co., Mark, 32-38 49 St., Long Island City 3, N.Y.—B,C,E,J,K,N,O  
 Smith-Meeker Eng'g. Co., 157 Chambers St., New York 7, N.Y.—G,J,O  
 Sonotone Corp., Elmsford, N.Y.—I  
 Specialty Assembling, 79 Clifton Pl., Brooklyn 38, N.Y.—B,C,K,N,O

Spera Electronics Labs., 37-10 33 St., Long Island City, N.Y.—C,E,N,O  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—C,F,N  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—C,H,N  
 Stephens Mfg., Corp., 8538 Warner Dr., Culver City, Calif.—K  
 Stromberg-Carlson Co., Rochester 3, N.Y.—B,C,E,F,C,J,K,M,N,O,P,Q  
 Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago 23, Ill.—K  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—I,L,P,Q  
 Telectro Industries, 35-16 37 St., Long Island City 1, N.Y.—C,F,K,N,O,P  
 Telex, 1633 Eustis St., St. Paul 1, Minn.—I  
 Transelectric Mfg. Co., Hopewell Rd., Oxford, Pa.—K,P  
 Trebor Radio Co., Pasadena 18, Calif.—K  
 Trutone Electronic Eng'g., 812 N. Highland Ave., Los Angeles 38, Calif.—J,K,N,O  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—B,C,G,H,N,O  
 U.S. Instrument Corp., 409 Broad St., Summit, N.J.—Q  
 U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—F,L,O  
 University Loudspeakers, 80 S. Kensico Ave., White Plains, N.Y.—J,O  
 Univex Corp., 102 Warren St., New York 7, N.Y.—C,H,N,O  
 Vacolite Co., 3003 N. Henderson St., Dallas 6, Texas—I,K  
 Videon Electronic Corp., 222 E. Ohio St., Indianapolis 4, Ind.—C  
 Vocaline Co., of America, Coulter St., Saybrook, Conn.—E,G,J,K,O  
 Webster Electric Co., 1900 Clark St., Racine, Wisc.—J,K,O  
 Western Mfg., Co., 1400 W. 22 St., Kearney, Nebr.—B,E,I,J,K,L,P,Q  
 Western Sound & Electric Labs., 805 S. Fifth St., Milwaukee 4, Wisc.—C,J,K,O  
 Westrex Corp., 111 Eighth Ave., New York 11, N.Y.—F  
 Wheeler Insulated Wire Co., 150 E. Aurora St., Waterbury, Conn.—Q  
 White Industries, 421 W. 54 St., New York 19, N.Y.—N  
 Wickes Eng'g. & Construction Co., 12 St. & Ferry Ave., Camden, N.J.—F,P  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—C,O  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio—C,F,N  
 Worner Electronic Devices, Rankin, Ill.—K

## 84—SPEAKERS

Horns, projector ..... A  
 Speakers, crystal ..... B  
 Speakers, electrodynamic ..... C  
 Speakers, explosion-proof ..... D  
 Speakers, high-fidelity ..... E  
 Speakers, magnetic ..... F  
 Speakers, PM dynamic ..... G  
 Tweeters ..... H  
 Woofers ..... I

Aeronautical Radio Mfg. Co., 155 First St., Mineola, L.I.—F  
 Altec-Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—A,E,G,H,I  
 ATLAS SOUND CORP., 1449 39 St., Brooklyn 18, N.Y.—A,D,I  
 Audicraft Inc., 77 S. 5 St., B'klyn 11, N.Y.—A,C  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—C,E,F,G,H,I  
 Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—A,C,D,E,F,G,H,I  
 Best Mfg. Co., 1200 Grove St., Irvington 11, N.J.—C,F  
 Bogen Co. David, 29 9 Ave., New York 14, N.Y.—E,G,H,I  
 Bozak Co., R. T., 114 Manhattan St., Stamford, Conn.—E,H,I  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—E,G,H,I  
 British Industries Corp., 164 Duane St., New York 13, N.Y.—A,E,G,H,I  
 Brociner Electronics Lab., 1546 2 Ave., New York 28, N.Y.—E,H,I  
 Brooks Radio & TV Corp., 84 Vesey St. New York 7, N.Y.—B,E,F  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—B  
 Carbonneau Industries, 100 Lexington Ave. S.W., Grand Rapids, Mich.—C,E,D,G  
 Cleveland Electronics, 6611 Euclid Ave., Cleveland 3, Ohio—C,E,F,G,H,I  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—B,E,F  
 Crescent Industries, 5900 W. Touhy Ave. Chicago 31, Ill.—F,G  
 C.-S. Mfg. Co., 4089 Lincoln Blvd., Venice, Calif.—E,F,I  
 Delco Radio Div., General Motors Corp., Kokomo, Ind.—G  
 Dilks Co., Derby Ave., Seymour, Conn.—A  
 DuKane Corp., St. Charles, Ill.—A,G  
 Ectro, Inc., 425 S. Sandusky St., Delaware, Ohio.—F  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan Mich.—A,B,C,D,E,F,G,H,I

Eltran Corp., 113 W. Station St., St. Anne, Ill.—F,G,H,I  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas.—C,G  
 GALBRAITH & SON, G. C., 450 Ave. of the Americas, New York 11, N.Y.—G  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—D  
 GENERAL ELECTRIC CO., RADIO-TV DEPT., Electronics Park, Syracuse, N.Y.—E,F  
 Glaser-Steers Corp., 2 Main St., Belleville, N.J.—C,F,G  
 HEPPNER MFG. CO., Round Lake Ill.—C,G  
 Horton Machine Products Co., 1091 Rockaway Ave., Valley Stream, L.I., N.Y.—G  
 Int'l. Electronics Corp., 147 Parkhouse St., Dallas 2, Texas.—E  
 Jensen Mfg. Co., 6601 S. Laramie Ave., Chicago 38, Ill.—A,C,E,G,H,I  
 Klipsch & Assoc., Box 64, Hope, Ark.—A,E,I  
 Lansing Sound Inc., James B., 2439 Fletcher Dr., Los Angeles 39, Calif.—E,G  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles, 64, Calif.—G  
 MAGNAVOX CO., Fort Wayne 4, Ind.—C,E,G  
 Michigan Electronics Inc., 854 N. Rockwell St. Chicago 22, Ill.—A  
 Optron Mfg. Co., 3223 N. Sheffield Ave., Chicago 13, Ill.—G  
 Oxford Electric Corp., 3911 S. Michigan Ave., Chicago 15, Ill.—C,E,F,G,H,I  
 Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—C,D,E,F,G,H,I  
 Quam-Nichols Co., 33rd Pl. & Cottage Grove Ave., Chicago 16, Ill.—C,E,G,H,I  
 Quincy Speaker Mfg. Co., 221 Oak St., Quincy, Ill.—F,G  
 Racon Electric Co., 52 E. 19th St., New York 3, N.Y.—A,G,H  
 RADIO CORP. OF AMERICA, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J.—A,B,C,D,E,F,G,H,I  
 RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—C,G  
 Radio Recorders, 7000 Santa Monica Blvd., Hollywood 38, Calif.—E  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—D  
 Rola Co., 2530 Superior Ave., Cleveland 14, Ohio.—C,G  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio.—A,E  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—E,G  
 Stephens Mfg. Corp., 8538 Warner Dr., Culver City, Calif.—C,E  
 Stromberg-Carlson Co., Rochester 3, N.Y.—A,D,E,G,H,I  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—A,C,D,H  
 Telex, 1633 Eustis St., St. Paul 1, Minn.—F  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—E  
 U.S. Recording Co., 1121 Vermont Ave., N.W., Washington 5, D.C.—A,E,F,G,H,I  
 University Loudspeakers Inc., 80 S. Kensico Ave., White Plains, N.Y.—A,C,D,E,G,H,I  
 Utah Radio Products Co., 1123 E. Franklin St., Huntington, Ind.—E,F,G,H,I  
 Wright, Inc., 2233 Univ. Ave., St. Paul, Minn.—G  
 Wright Zimmerman, Inc., 330 5 Ave., New Brighton 12, Minn.—G

## 85—SPEAKER ACCESSORIES

Acoustic chambers ..... A  
 Baffles ..... B  
 Cabinets ..... C  
 Grill cloths ..... D  
 Coils, crossover ..... E  
 Coils, field ..... F  
 Cones ..... G  
 Driver, PM ..... H  
 Exciters, field ..... I  
 Shims, adjusting ..... J  
 Stands ..... K

Aerolite Electronics Corp., 507 26 St., Union City, N.J.—E,F,I  
 ALTEC LANSING CORP., 9356 Santa Monica Blvd., Beverly Hills, Calif.—B,C,H  
 American Wood Working Co., 1682 N. Lowell Ave., Chicago 39, Ill.—B,C,J  
 ATLAS SOUND CORP., 1449 39 St., Brooklyn 18, N.Y.—B,H,K  
 Audicraft, 77 S. 5 St., Brooklyn 11, N.Y.—H  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—B,C,D,E,F,G,I  
 Beam Instruments Corp., 350 5 Ave., New York 1, N.Y.—C,H  
 Bestcraft Products Co., 626 Broadway, New York 12, N.Y.—D  
 Bogen Co., David, 29 9 Ave., New York 14, N.Y.—B,C  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—G  
 British Industries Corp., 164 Duane St. New York 13, N.Y.—B,D,E,H  
 Brociner Electronics Lab., 1546 2 Ave., New York 28, N.Y.—H  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—B,C,D  
 BUD RADIO INC., 2118 E 55 St., Cleveland 3, Ohio.—B,C  
 Carbonneau Industries, 100 Lexington Ave., S.W., Grand Rapids, Mich.—E,F

Castlewood Mfg. Co., 1430 S. 12 St., Louisville 10, Ky.—C  
 Cleveland Electronics, 6611 Euclid Ave., Cleveland 3, Ohio.—B,D  
 Coil Eng'g. & Mfg. Co., Roanoke, Ind.—F  
 Cordware Eng'g., 2195 42 Ave., Oakland 1, Calif.—E  
 Costlow Co., John A., 125 Kansas Ave., Topeka, Kan.—B,C  
 Custom Electronics, 813 Chartres St., New Orleans, La.—A,B,C  
 Dilks Co., Derby Ave., Seymour, Conn.—H  
 Duane Corp., St. Charles, Ill.—B  
 Electro-Technics, Inc., 198 Albion Ave., Paterson N.J.—E,F  
 Electro-Voice, Inc., Cecil & Carroll Sts., Buchanan, Mich.—A,B,C,E,F,H,I  
 Ellar Woodcraft Corp., 431 W 28 St. New York 1, N.Y.—B,C  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas.—E  
 Fidelity Products Co., 2 Lackawanna Pl., S. Orange, N.J.—B  
 Fisher Radio Corp., 45-41 Van Dam St., Long Island City 1, N.Y.—C  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—D  
 General Communications, P O Box 169, Fort Atkinson, Wisc.—B  
**GENERAL ELECTRIC CO., RADIO-TV DEPT.**, Electronics Park, Syracuse, N.Y.—B  
 Glaser-Steers Corp., 2 Main St., Belleville, N.J.—H  
 Hawley Products Co., 335 N 6 St., St. Charles, Ill.—B,C,G  
**INSULINE CORP. OF AMERICA**, 36-02 35 Ave., Long Island City, N.Y.—C  
 Int'l Electronics Corp., 147 Parkhouse St., Dallas 2, Texas.—E  
 Jensen Mfg. Co., 6601 S. Laramie Ave., Chicago 38, Ill.—A,B,C,E,F,G,H  
 J F D Mfg. Co., 6101 16 Ave., Brooklyn 4, N.Y.—D,J  
 Lansing Sound Inc., James B., 2439 Fletcher Dr., Los Angeles 39, Calif.—B,C,H  
 Lowell Mfg. Co., 3030 Laclede Station Rd., St. Louis 17, Mo.—B,C,D  
 Magna Electronics Inc., 9810 Anza Blvd., Inglewood, Calif.—B  
 Mark Electronics Inc., 86 Shipman St., Newark 2 N.J.—E,F  
 Oberline Ltd., 6411 Hollywood Blvd., Hollywood 28, Calif.—B,C  
 Oxford Electric Corp., 391 S. Michigan Ave., Chicago 15, Ill.—F  
 Pentron Corp., 221 E. Cullerton Ave., Chicago 16, Ill.—B  
 Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—A,B,C,E,F,H

Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—C  
 Racon Electric Co., 52 E 19 St., New York 3, N.Y.—B,E,H  
**RADIO CORP. OF AMERICA**, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J.—B,C  
 Radio & TV Inc., Brunswick Div., 119 W. 57 St., New York 19, N.Y.—B  
 Rapid Die & Molding Co., 3901 Wesley Terrace, Schiller Park, Ill.—G  
 Rigidized Metals Corp., 658 Ohio St., Buffalo 3, N.Y.—D  
 River Edge Industries, 5 River Edge Rd., River Edge, N.J.—B,C  
 R.J. Audio Products, 164 Duane St., New York 13, N.Y.—B  
 Rowe Industries, 1702 Wayne St., Toledo 9 Ohio.—A,H  
 Scott Inc., Herman Hosmer, 385 Putnam Ave., Cambridge 39, Mass.—E  
 Semrow Products Co., 6120 N. W. Highway, Chicago 31, Ill.—B,D  
 Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—K  
 Standard Electronics Corp., 285 Emmet St., Newark 5 N.J.—B,C  
 Stephens Mfg. Corp., 8538 Warner Dr., Culver City, Calif.—A,B,C,E,H  
 Stevens Products, 86 Main St., E. Orange, N.J.—G  
 Stromberg-Carlson Co., Rochester 3, N.Y.—A,B,C,H  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 24, N.Y.—H  
 Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—C  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—A,G,H  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—K  
 Triad Portable Case Corp., 310 W. Lincoln Ave., Mount Vernon, N.Y.—B,C  
 U. S. Electronics Corp., 275 Warren St., Lyndhurst, N.J.—F  
 U. S. Recording Co., 1121 Vermont Ave., N. W., Washington 5, D.C.—H,K  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—E  
**UNIVERSITY LOUDSPEAKERS INC.**, 80 S. Kensico Ave., White Plains, N.Y.—B,C,H  
 Utah Radio Products Co., 1123 E. Franklin St., Huntington, Ind.—B,C,F  
 Waldom Electronics, Inc., 911 N. Larrabee St., Chicago 10, Ill.—F,G  
 Woodall Industries, Inc., 7569 E. McNichols Rd., Detroit 34, Mich.—C  
 Wright, Inc., 2233 University Ave., St. Paul 14, Minn.—B,C  
 Wright Zimmerman, Inc., 330 5 Ave., New Brighton 12, Minn.—B

**CINEMA ENG'G. CO., DIV. AEROVOX CORP.**, 1510 W. Verdugo, Burbank, Calif.—B,C,L  
 Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.—F  
 Clarke Instruments, 919 Jesup-Blair Dr., Silver Spring, Md.—I  
 Collins Radio Co., 855 35 St., N. E., Cedar Rapids, Iowa.—C  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—C,H,N  
 Cunningham Sons & Co., Rochester 8, New York.—E  
 Custom Electronics Cor., 738 Speedwell Ave., Morris Plains, N.J.—H,N  
 Deagen, Inc., J. C., 1770 W. Berteau Ave. Chicago 13, Ill.—L  
 DeWald Radio, United Scientific Labs., 35-15 37 Ave., Long Island City 1, N.Y.—I  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—C,H,J,K,N  
**DUMONT LABS. INC.**, ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—A,C,E,F,G,K,L,M  
**DUMONT LABS. INC.**, ALLEN B., TV TRANSMITTER DIV., 1500 Main Ave., Clifton, N.J.—A,E,F,G,H,I,J,K,L,M  
**DUMONT LABS. INC.**, ALLEN B., 2 Main Ave., Passaic, N.J.—A,C,D,E,F,G,J,K,L,M  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas.—C,G,J  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,C,F,J,K,M,N  
**FAIRCHILD RECORDING EQUIP. CORP.**, 154 St. & 7 Ave., Whitestone, N.Y.—C  
 Federal Telecommunication Labs., Inc., 500 Washington Pl., Nutley, N.J.—A,F,G,L,M,E  
**GATES RADIO CO.**, 123 Hampshire St., Quincy, Ill.—A,C,E,F,J,K,L,M  
 General Communications, P O Box 169, Fort Atkinson, Wisc.—A,C,E,F,G,J,K,L  
**GENERAL ELECTRIC CO.**, Electronics Park, Syracuse, N.Y.—C  
**GENERAL PRECISION LAB.**, 63 Bedford Rd., Pleasantville, N.Y.—A,F  
**GRAY RESEARCH & DEVEL. CO.**, 658 Hilliard St., Manchester, Conn.—L  
**HOUSTON FEARLESS CORP.**, 11801 W. Olympic Blvd., Los Angeles 84, Calif.—K  
 Hycor Co., 11423 Vanowen St., North Hollywood, Calif.—C  
 Int'l Electronics Corp., 147 Parkhouse St., Dallas 2, Texas.—C  
 Int'l Research Assoc., 2221 Warwick Ave., Santa Monica, Calif.—A,K  
 Kilgen Aircraft Div., of Kilgen Organ Co., 4632 W. Florissant Ave., St. Louis 15, Mo.—C,F  
 Kliegl Bros., 321 W. 50 St., New York 19, N.Y.—L  
**LAS-LAB**, 316 W. Saratoga St., Baltimore 1, Md.—N  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—A,C,F,G  
 Metal Products Co., Craighead St., Nashville 4, Tenn.—C,M  
 Metal Textile Corp., Roselle, N.J.—B  
 Motorola, Inc., 4545 Augusta Blvd., Chicago, Ill.—C  
 Oberline Ltd., 6411 Hollywood Blvd., Hollywood 28, Calif.—C,J  
 O'Brien Electric Corp., 6514 Santa Monica Blvd., Hollywood 38, Calif.—C,J  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—I  
**POLARAD ELECTRONICS CORP.**, 100 Metropolitan Ave., Brooklyn 11, N.Y.—A,H,N  
**RADIO CORP. OF AMERICA**, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J.—A,C,D,E,J,K  
 Radio Music Corp., 84 S. Water St., Port Chester, N.Y.—C,J  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—C  
**RAYTHEON MFG. CO.**, Waltham 54, Mass.—K,M  
 Reevesound Co., 35-54 36 St., Long Island City, 1, N.Y.—D  
**SHALLCROSS MFG. CO.**, 520 Pusey Ave., Collingdale, Pa.—E  
 Shrader Mfg. Co., 2803 M. St., N. W., Washington, D.C.—C  
 Smith Meeker Eng'g. Co., 157 Chambers St., New York 7, N.Y.—C  
 Special Effects & Equip. Inc., 418 W. 54 St., New York 19, N.Y.—L  
 Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—A,G  
 Stancil-Hoffman Corp., 921 N. Highland Ave., Hollywood 38, Calif.—C,J  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A,C,D,E,F,M  
 Stephens Mfg. Corp., 8538 Warner Dr., Culver City, Calif.—M  
 T-Bar V Inc. (Backgrounds Unlimited) 5919 Hollywood Blvd., Hollywood 28, Calif.—L  
 Technical Appliance Corp., 1 Taco St., Sherburne, N.Y.—A  
**TELECHROME, INC.**, 88 Merrick Rd., Amityville, L.I., N.Y.—A,G,I,L  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—I  
 Televiso Specialty Co., 350 W. 31 St., New York 1, N.Y.—A,H,L  
**TEL-INSTRUMENT CO.**, 50 Patterson Ave., E. Rutherford, N.J.—A,G  
 U. S. Recording Co., 1121 Vermont Ave., N. W., Washington 5, D.C.—A,C  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—L  
 Victorlite Industries, 4117 W. Jefferson Blvd., Los Angeles 16, Calif.—N

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**86—STUDIO EQUIPMENT,  
 AUDIO**

- Amplifiers, distribution . . . . . A**
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- Consoles, control . . . . . D**
- Consoles, remote switching . . . . . F**
- Controls, master . . . . . E**
- Distribution equipment . . . . . G**
- Receivers, cue . . . . . H**
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- Remote audio equipment . . . . . J**
- Remote pickup, audio . . . . . K**
- Special effects equipment . . . . . L**
- Studio transmitter links . . . . . M**
- Transmitters, cue . . . . . N**

Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N.Y.—H  
 Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—A,C,D,E,G,K,M  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—C  
 American Radiotelephone Co., St. Petersburg, Fla.—J  
 Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—L  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—C  
 Baugham Co., E. J., 350 S. Central, Los Angeles 13, Calif.—A,C,E,F,G,H,K,L,M,N  
 Berliant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.—J  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—C  
 Bogen Co., David, 29 9 Ave., New York 14, N.Y.—C  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—K,N



Vidaire Electronics Mfg., 576 W. Merrick Rd., Lynbrook, L.I., N.Y.—I  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—H,N  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio.—A,D,E,F,G

### 87—STUDIO EQUIPMENT, TV

(Color & Black-and-White)

Adapters, field sequential . . . . . A  
 Adapters, line & dot sequential . . . . . B  
 Amplifiers, distribution . . . . . C  
 Amplifiers, montage . . . . . D  
 Amplifiers, stabilizing . . . . . E  
 Camera cranes . . . . . F  
 Camera dollies . . . . . G  
 Camera switching equipment . . . . . H  
 Camera turrets . . . . . I  
 Cameras, field . . . . . J  
 Cameras, studio . . . . . K  
 Cameras, TV film . . . . . L  
 Color TV Equipment . . . . . AS  
 Consoles, control . . . . . M  
 Consoles, remote switching . . . . . N  
 Controls, camera . . . . . O  
 Controls, remote camera . . . . . P  
 Controls, master . . . . . Q  
 Controls, TV film . . . . . R  
 Control equipment . . . . . S  
 Converters, field sequential . . . . . T  
 Distribution equipment . . . . . U  
 Generators, color signal . . . . . V  
 Generators, Sync . . . . . W  
 Generators, sync stretchers . . . . . X  
 Generators, TV signal . . . . . Y  
 Lenses . . . . . Z  
 Monitors, line & program . . . . . AA  
 Panels, video patch . . . . . AB  
 Projection units . . . . . AC  
 Projectors, TV film . . . . . AD  
 Projectors, TV kaleidoscope . . . . . AE  
 Projectors, TV mirror multiplexers . . . . . AF  
 Projectors, TV rear screen . . . . . AG  
 Projectors, TV slide . . . . . AH  
 Projectors, TV special purpose . . . . . AI  
 Receivers, cue . . . . . AJ  
 Receivers, studio . . . . . AK  
 Remote pickup, video . . . . . AL  
 Scanners, flying spot . . . . . AM  
 Special effects equipment . . . . . AN  
 Studio transmitter links . . . . . AO  
 Transmitters, cue . . . . . AP  
 Tripods . . . . . AQ  
 Tubes, color . . . . . AR

Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N.Y.—AJ  
 Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—C,J,M,N,Q,AA,AB,AL, AO  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—AB  
 American Optical Co., Buffalo 15, N.Y.—AG, AH  
 Ampco Corp., 2835 N. Western Ave., Chicago 18, Ill.—AD,AG  
 Audio Equipment Sales, 153 W. 33 St., New York 1, N.Y.—AB  
 Background Engineers, 7313 Santa Monica Blvd., Hollywood 46, Calif.—AG,AH  
 Back Video Corp., F. G., 500 5 Ave., New York 36, N.Y.—Z  
 Baugham Co., A. J., 350 S. Central, Los Angeles 13, Calif.—C,D,E,F,G,H,I,J,L,M,N,O,P,Q,R,U,W,X,Z,AA,AB,AC,AD,AE,AF, AG,AH,AI,AJ,AL,AM,AN,AP,AA,AQ  
 Bausch & Lomb Optical Co., 628 St. Paul St., Rochester, N.Y.—Z  
 Bayside Watch Tool Co., 20-02 Utopia Parkway, Whitestone 57, N.Y.—J,K,L  
 BELL & HOWEL CO., 7100 McCormick Rd., Chicago 45, Ill.—J,K,L,Z,AC,AQ  
 Berlant Associates, 4917 W. Jefferson Blvd., Los Angeles 16, Calif.—AL  
 Berndt-Bach, Inc., Auricon Div., 7325 Beverly Blvd., Los Angeles 36, Calif.—L,R,AQ  
 Beseler Co., Chas., 60 Badger St., Newark 8, N.J.—AH,AI  
 Bodde Screen & Projector Co., 8829 Venice Blvd., Los Angeles 34, Calif.—AC,AG,AH  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—X  
 British Electronic Sales, 23-03 45 Rd., Long Island City, N.Y.—Z  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—AJ,AL,AP  
 Buggie & Co., H. H., 726 Stanton St., Toledo 1, Ohio.—AB  
 Buhl Optical Co., 1009 Beech Ave., Pittsburgh, 12, Pa.—Z  
 BURKE & JAMES, 321 S. Wabash Ave., Chicago 4, Ill.—Z  
 CAMERA EQUIPMENT CO., 1600 Broadway, New York 19, N.Y.—F,G,I,Z,AQ

CINEMA ENGINEERING CO., Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—AN  
 CAMERA MART, 1845 Broadway, New York 23, N.Y.—F,G,L,Z,AD,AG,AH,AQ  
 Castlewood Mfg. Co., 1430 S. 12 St., Louisville, 10, Ky.—AK  
 Clare & Co., C. P., 4719 Sunnyside Ave., Chicago 30, Ill.—N  
 Clarke Instruments, 919 Jesup-Blair Dr., Silver Spring, Md.—AB,AK  
 Color Television Inc., 973 E. San Carlos Ave., San Carlos, Calif.—K  
 Colorvision Plastics, Inc., 247 Atlantic Ave., Boston 10, Mass.—Z  
 Conrac, Inc., 19217 E. Foothill Blvd., Glendora, Calif.—AA  
 Corning Glass Works, P O Box 544, Corning, N.Y.—Z  
 Costelow Co., John A., 125 Kausas Ave., Topeka, Kan.—AJ,AP  
 Dage Electronics Corp., 69 N. 2 St., Beech Grove, Ind.—G,I,J,L,W,Z,AL,AQ  
 Daven Co., 191 Central, Newark 4, N.J.—H  
 Delaware Optical Labs., 36 S. Williams St., Lansdowne, Pa.—Z,AC  
 DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—AK  
 Dorn Equipment Corp., 88 Broad St., Boston 10, Mass.—Z  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—K,AJ,AP  
 Dumont Electric Corp., 308 Dyckman St., New York 34, N.Y.—T  
 DuMONT LABS., INC., ALLEN B., 2 Main Ave., Passaic, N.J.—D,E,F,G,H,I,J,L,O,R,X,W,Z,AA,AC,AD,AG,AH,AI,AL,AM, AO,AQ  
 DuMONT LABS. INC. ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—C. D. E. F. G. H. I. J. K. L. M. N. O. P. Q. U. V. W. X. Z. AA. AB. AC. AD. AE. AF. AG. AH. AI. AL. AM. AN. AO. AQ  
 DUMONT LABS., INC., ALLEN B., TV TRANSMITTER DIV., 1500 Main Ave., Clifton, N.J. — C. D. E. F. G. H. I. J. L. M. N. O. P. Q. R. S. U. V. W. X. Z. AA. AB. AC. AD. AE. AF. AG. AH. AI. AJ. AK. AL. AM. AN. AO. AQ  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas.—U  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—C,D,E,Q,W,X,AA,AL,AO,AP  
 FAIRCHILD CAMERA & INSTRUMENT CORP., Robbins Lane, Syosset, N.Y.—J,L,O,S  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7 Ave., Whitestone, N.Y.—X  
 Federal Telecommunication Labs., Inc., 500 Washington Place, Nutley, N.J.—C,D,E,J,K,L,M,N,O,Q,U,W,AA,AB,AL,AM,AN,AO  
 Flett Lab., 3711 Marshall Rd., Drexel Hill, Pa.—G,I,AC,AF,AH,AI  
 Gale Dorothea Mechanisms, 81-01 Broadway, Elmhurst, L.I., N.Y.—AG,AH,AI  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—C,E,M,N,Q,AA,AL,AN,AO  
 General Communications, Box 169, Fort Atkinson, Wis.—C,D,H,M,N,Q,U,AA,AL,AN  
 GENERAL PRECISION LAB., 63 Bedford Rd., Pleasantville, N.Y.—C,E,G,H,J,K,L,M,N,O,P,R,W,Z,AA,AC,AD,AG,AH,AI,AL,AM,AQ  
 Glaser-Steers, 2 Main St., Belleville, N.J.  
 Graybar Electric Co., Nat'l Headquarters, 420 Lexington Ave., New York 17, N.Y.—C,M,U  
 GRAY RESEARCH & DEVEL. CO., 598 Hilliard St., Manchester, Conn.—I,AC,AD,AF,AH,AI,AN  
 Harwood Mfg. Co., 466 W. Superior St., Chicago 10, Ill.—AQ  
 HOUSTON FEARLESS CORP., 11801 W. Olympic Blvd., Los Angeles 64, Calif.—F,G,I,P,AL,AQ  
 Int'l Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—C,AL  
 Int'l Telemeter Corp., 2000 Stoner Ave., Los Angeles 25, Calif.—A,G,U  
 Kilgen Aircraft Div., of Kilgen Organ Co., 4632 W. Florissant Ave., St. Louis 15, Mo.—M,N,S  
 Kliegl Bros., 321 W. 50 St., New York 19, N.Y.—Z,AC,AN  
 LAS-LAB, 316 W. Saratoga St., Baltimore 1, Md.—L  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—C,E,F,G,H,J,K,L,M,N,O,P,U,W,AA  
 Metal Products Co. Craighead St., Nashville 4, Tenn.—C,AO  
 Meyer-Opticraft, Inc., 39 W. 60 St., New York 23, N.Y.—Z  
 Mitchell Camera Corp., 666 W. Harvard St., Glendale 4, Calif.—J,K,L,Z  
 National Cine Equip., 209 W. 48 St., New York 36, N.Y.—G  
 North Electric Mfg. Co., S. Market St., Galion, Ohio.—S  
 Pancro Mirrors, Inc., 2958 Los Feliz Blvd., Los Angeles 39, Calif.—Z  
 Par Products Corp., 926 N. Citrus Ave., Hollywood 38, Calif.—I,Z  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—AK  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—C,W,AA,AJ,AP  
 Ponder & Best, 814 N. Cole Ave., Hollywood 38, Calif.—L,Z  
 Precision Products, 719 7 St., N. W., Washington, D.C.—Z

RADIO CORP. OF AMERICA, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J.—C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,U,W,X,Z,AA,AB,AC,AD,AE,AF,AG,AH,AI,AL,AM,AN,AO,AQ  
 RADIO CORP. OF AMERICA RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—W,Y,AM  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—AL  
 Rangertone, Inc., 73 Winthrop St., Newark 4, N.J.—O  
 Rauland Corp., 4245 N. Knox Ave., Chicago 41, Ill.—AR  
 Raven Screen Corp., 124 E. 124 St., New York 35, N.Y.—AG  
 RAYTHEON MFG. CO., Waltham 54, Mass.—AL,AO  
 Semon Bache & Co., 636 Greenwich St., New York 14, N.Y.—Z  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—Q  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—AA  
 S.O.S. Cinema Supply Corp., 602 W. 52 St., New York 19, N.Y.—F,G,L,O,AC,AG,AN,AQ  
 Special Effects & Equip., Inc., 418 W. 54 St., New York 19, N.Y.—AG,AN  
 Spencer-Kennedy Labs., 186 Mass. Ave., Cambridge 39, Mass.—C,U  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,W,X,Z,AA,AB,AC,AD,AF,AH,AO,AQ  
 Stephens Mfg. Corp., 8538 Warner Dr., Culver City, Calif.—AO  
 T-bar-V Inc., "Backgrounds Unlimited," 5919 Hollywood Blvd., Hollywood 28, Calif.—Z,AG,AI,AN  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—A,B,C,D,E,J,K,L,M,P,S,T,U,V,W,X,Y,Z,AA,AH,AI,AM,AN,AR  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—H,I,J,O,P,S,Y,AC,AK,AM  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—C,F,G,J,K,L,Z,AA,AC,AD,AF,AG,AH,AJ,AQ  
 Television Utilities Corp., 1315 Jericho Turnpike, New Hyde Park, L.I., N.Y.—AA  
 Television Zoomar Corp., 500 5 Ave., New York 36, N.Y.—Z  
 TEL-INSTRUMENT CO., 50 Patterson Ave., E. Rutherford, N.J.—C,U,V,W  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—J,K,L  
 Trans-Lux Corp., 1270 Ave. of the Americas, New York 20, N.Y.—AG,AH  
 U. S. Recording Co., 1121 Vermont Ave., N. W., Washington 5, D.C.—C  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—AN  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—AR  
 Victorlite Industries, 4117 W. Jefferson Blvd., Los Angeles 16, Calif.—AC,AG,AI,AP  
 Vidaire Electronics Mfg. Co., 576 W. Merrick Rd., Lynbrook, L.I., N.Y.—A,AK  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—AJ,AP  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—J,L,AC,AD,AH,AI,AQ  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio.—C,E,H,J,K,L,M,N,O,P,Q,R,U,W,X,AA  
 WOLLENSAK OPTICAL CO., 850 Hudson Ave., Rochester 21, N.Y.—Z

### 88—STUDIO ACCESSORIES

Clocks . . . . . A  
 Fire detection & fighting equipment . . . . . B  
 Miscellaneous color accessories . . . . . I  
 Patch cords . . . . . C  
 Power supplies . . . . . D  
 Racks, disc storage . . . . . E  
 Racks, tape storage . . . . . F  
 Rack equipment . . . . . G  
 Test equipment . . . . . H

Acme Electronics, 300 N. Lake Ave., Pasadena 4, Calif.—D  
 Adler Communications Labs., 1 Le Fevre Lane, New Rochelle, N.Y.—D  
 Aerolite Electronics Corp., 507-26 St., Union City, N.J.—C  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass.—G  
 American Electronering Corp., 2040 Colo. Ave., Santa Monica, Calif.—D  
 American Wood Working Co., 1682 N. Lowell Ave., Chicago 39, Ill.—G  
 Arey Machine Co., 38 Long Ave., Hillside 5, N.J.—C  
 Art-Lloyd Metal Products Corp., 2973 Cropsy Ave., Brooklyn 14, N.Y.—G  
 Audio Equipment Sales, 153 W. 33 St., New York 1, N.Y.—C  
 Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—G  
 Baugham Co., E. J., 350 S. Central, Los Angeles 13, Calif.—C,D  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—D,H  
 Bucks County Enterprises, Quakertown, Pa.—E,G,F

Buggie & Co., H. H., 726 Stanton St., Toledo 1, Ohio.—C  
 Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—D,H  
 Clarke Instruments, 919 Jesup-Blair Dr., Silver Spring, Md.—C  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—D  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A  
 Daven Co., 191 Central Ave., Newark 4, N.J.—H  
 Dimco-Gray Co., 207 E. 6 St., Dayton 2, Ohio.—A  
 Dorn Equip. Corp., 88 Broad St., Boston 10, Mass.—C  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—C,D  
 DUMONT LABS., INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—C,D  
 DUMONT LABS., INC., ALLEN B., 2 Main Ave., Passaic, N.J.—C,D,G  
 DUMONT LABS., INC., ALLEN B., TV TRANSMITTER DIV., 1500 Main Ave., Clifton, N.J.—C,D  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—B  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas.—C  
 Federal Telecommunication Labs., 500 Washington Place, Nutley, N.J.—C,D  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—B  
 Gamewell Co., Newton Upper Falls 64, Mass.—B  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—D,G  
 General Communications, P O Box 169, Fort Atkinson, Wis.—D  
 GENERAL PRECISION LAB., 63 Bedford Rd., Pleasantville, N.Y.—D  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—G  
 Int'l Research Corp., 2221 Warwick Ave., Santa Monica, Calif.—D  
 Karp Metal Products Co., 211 63 St., Brooklyn, N.Y.—F,G  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—G  
 Kepco Labs., 131-38 Sanford Ave., Flushing, 55, N.Y.—D  
 Kliegl Bros., 321 W. 50 St., New York 19, N.Y.—C  
 Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—G  
 Lord-Taber Co., 40 Ontario St., Canandaigua, N.Y.—B  
 Malkin-Illion Co., 396 Coit St., Irvington 11, N.J.—G  
 Neutronic Associates, 83-56 Vietor Ave., Elmhurst 73, N.Y.—D  
 O'Brien Electric Corp., 6514 Santa Monica Blvd., Hollywood 38, Calif.—E,F,G  
 Onan & Sons Inc., University Ave., W.E., at 25, Minneapolis, Minn.—D  
 Opad-Green Co., 71 Warren St., New York 7, N.Y.—D  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—D  
 Pentron Corp., 221 E. Cullerton Ave., Chicago 16, Ill.—F  
 Plymouth Electronics Corp., 50 Kingsbury St., Worcester, Mass.—D  
 POLARAD ELECTRONICS CORP., 100 Metropolitan Ave., Brooklyn 11, N.Y.—D  
 RADIO CORP. OF AMERICA, RCA Victor Div., Eng'g. Products Div., Camden 2, N.J.—C,D  
 Reevesound Co., 35-54 36 St., Long Island City, 1, N.Y.—A  
 Rupp's Assembling & Mfg. Works, 2341 N. Seminary Ave., Chicago 14, Ill.—C  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—H  
 Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.—D  
 SPEER RESISTOR DIV., SPEER CARBON CO., St. Marys, Pa.—F  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—C,D,G

# ELECTRONIC INDUSTRIES DIRECTORY

Tektronix, Inc., P.O. Box 8311, Portland 7, Ore.—H  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—D,G,H  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—D  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—A  
 TEL-INSTRUMENT CO., 50 Patterson Ave., E. Rutherford, N.J.—D  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A  
 Wallach & Associates, 1532 Hillcrest Rd., Cleveland 18, Ohio.—E,F  
 Wickes Eng'r. & Const. Co., 12 St. & Ferry Ave., Camden, N.J.—A  
 Williams, Brown & Earle, 904 Chestnut St., Philadelphia 7, Pa.—F  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio.—D  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—H

## 89—SWITCHES

Switches, circuit breaker ..... A  
 Switches, coaxial ..... B  
 Switches, commutator ..... C  
 Switches, crossbar ..... D  
 Switches, decade ..... E  
 Switches, float ..... F  
 Switches, fluorescent lamp starter G  
 Switches, jack ..... H  
 Switches, key ..... I  
 Switches, knife ..... J  
 Switches, mercury ..... K  
 Switches, oil immersed ..... L  
 Switches, plunger ..... M  
 Switches, pressure ..... N  
 Switches, programmer ..... O  
 Switches, push-button ..... P  
 Switches, rotary sampling ..... Q  
 Switches, rotary selector ..... R  
 Switches, safety-interlock ..... S  
 Switches, slide ..... T  
 Switches, snap action ..... U  
 Switches, stepping ..... V  
 Switches, telemetering ..... W  
 Switches, thermal ..... X  
 Switches, time delay ..... Y  
 Switches, toggle ..... Z  
 Switches, vacuum ..... AA  
 Switches, wave change receiver .AB  
 Switches, wave change, transmitter ..... AC  
 Switches, waveguide ..... AD

Acro-Mu Switch Div., Acro Mfg. Co., 2040 E. Main St., Columbus 16, Ohio—U  
 ADAMS & WESTLAKE CO., 1025 N. Michigan, Elkhart, Ind.—K,Y  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—J,T,Z  
 Aeronautical Radio Mfg. Co., 155 First St., Mineola, N.Y.—A,Z  
 Air Associates Inc., 1231 Airway, Glendale 1, Calif.—A,Z  
 AIRTRON, INC., 20 E. Elizabeth Ave., Linden, N.J.—AB,AC  
 Alina Corp., 401 Broadway, New York 13, N.Y.—Y  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—F,R  
 American Radio Hardware Co., 152 Mac-Questen Parkway S., Mount Vernon, N.Y.—I,T  
 Anglo Corp., 2037 W. Division St., Chicago 22, Ill.—Y  
 Applied Science Corp., P.O. Box 44, Princeton, N.J.—R  
 A.R.F. Products, Inc., 7627 Lake St., River Forest, Ill.—B  
 Arrow-Hart & Hegeman, 103 Hawthorn St., Hartford 6, Conn.—F,P,R,T,U,Z  
 Audio & Video Products, 730 Fifth Ave., New York 19, N.Y.—R  
 Aurex Corp., 1117 N. Franklin St., Chicago 10, Ill.—U  
 Automatic Electric Co., 1033 W. Van Buren St., Chicago 7, Ill.—I,P,V  
 Automatic Switch Co., 391 Lakeside Ave., Orange, N.J.—Y  
 Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—P

Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—R  
 Bird Electronic Corp., 1800 E. 38 St., Cleveland 16, Ohio—B  
 Birnbach Radio Co., 145 Hudson St., New York 13, N.Y.—J,P,T,Z  
 BLONDER-TONGUE LABS., 526 North Ave., E. Westfield, N.J.—X  
 BOGART MFG. CO., 315 Seigel St., Brooklyn 6, N.Y.—B, AB, AC  
 Bracke-Seib X-Ray Co., 293 Third Ave., New York 10, N.Y.—A  
 Brooks Radio & T.V. Corp., 84 Vesey St., New York 7, N.Y.—R,Z  
 Carling Electric, 505 New Park Ave., W. Hartford 10, Conn.—P,R,T,U,Z  
 Carter Parts Co., 213 Institute Pl., Chicago 10, Ill.—A  
 CENTRALAB., DIV. GLOBE-UNION INC., 900 E. Keefe Ave., Milwaukee 1, Wis.—E,R,T,AB,AC  
 Chaunam Electronics Corp., 475 Washington St., Newark 2, N.J.—AA  
 Cherry-Channer Corp., 1488 Skokie Blvd. High Highland Park, Ill.—U  
 CHICAGO TELEPHONE SUPPLY, 1142 W. Beardsley Ave., Elkhart, Ind.—R,U,AB,AC  
 CINEMA ENG'G. CO., Div. Aerovox Corp., 1510 W. Verdugo Ave., Burbank, Calif.—R  
 Clare & Co., C.P., 4719 Sunnyside Ave., Chicago 30, Ill.—I,P,V  
 Clark Cooper Co., Market St., Palmyra, N.J.—F,N,X  
 COAXIAL CONNECTOR CO., 35 N. 2 Ave., Mount Vernon, N.Y.—B  
 Colvin Labs., 12 Court, Morristown, N.J.—N  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—I,P,U  
 Consolidated Eng'g. Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—V  
 Control Products, Inc., 306 Sussex St., Harrison, N.J.—X,Z  
 Cook Electric, 2700 Southport Ave., Chicago 14, Ill.—N,R,X,Y,AA  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—A,B,I,K,N,P  
 Cramer Co., Box 49, Centerbrook, Conn.—Y  
 Cunningham Son & Co., James, 13 Canal St., Rochester 8, N.Y.—D  
 Cutler-Hammer, Inc., 436 N. 12 St., Milwaukee 1, Wis.—A,F,J,N,P,R,S,U,V,X,Y,Z,AA  
 Daven Co., 191 Central Ave., Newark 4, N.J.—E,R,V,AB,AC  
 Dietz Co., Henry G., 12-16 Astoria Blvd., Long Island City 2, N.Y.—S  
 Dimco-Gray, 207 E. 6 St., Dayton 2, Ohio—Y  
 Dolinko & Wilkens, 1901 Summit Ave., Union City, N.J.—AA  
 Dormitzer Electric & Mfg., Co., 5 Hadley St., Cambridge 40, Mass.—G  
 Dorne & Margolin, 30 Sylvester St., Westbury, N.Y.—B  
 Eagle Electric Mfg. Co., 23-10 Bridge Plaza S., Long Island City, N.Y.—J,P,U,Z  
 Eagle Signal Co., 202 20 St., Moline, Ill.—Y  
 Eastern Specialty Co., 3617 N. 8 St., Philadelphia 40, Pa.—R  
 Edison, Inc., Thomas A., Instrument Division, 93 Lakeside Ave., W. Orange, N.J.—X,Y  
 Eicor, 1501 W. Congress, Chicago 7, Ill.—Y  
 Eitel-McCullough, Inc., 798 San Mateo Ave., San Bruno, Calif.—AA  
 Electro Development Co., 6006 W. Washington Blvd., Culver City, Calif.—R  
 Electromatic Mfg., Corp., 88 University Pl., New York 3, N.Y.—R,AB,AC  
 Electro-Snap Switch & Mfg. Co., 4218 W. Lake St., Chicago 24, Ill.—P,R,S,U,Z  
 Electro-Tech. Equip. Co., 308 Canal St., New York, N.Y.—A,F,K,N,P,R,S,T,U,Z  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—B  
 Eureka T.V. & Tube Corp., 69 Fifth Ave., Hawthorne, N.J.—U,X,Y  
 Farmer Electric Co., 21 Mossfield Rd., Waban 68, Mass.—Y  
 Federal A.C. Switch Corp., 72 Kinglsey St., Buffalo 8, N.Y.—AB,AC  
 Federal Screw Products, 224 W. Huron St., Chicago 10, Ill.—T,Z  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—I  
 Fenwel Inc., Ashland, Mass.—X  
 Five Star Co., Plantsville, Conn.—U  
 Gables Eng'g. Inc., 247 Greco Ave., Coral Gables, Fla.—R  
 Gee-Lar Mfg. Co., 1330 10 Ave., Rockford, Ill.—U,Z  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—T,Z  
 General Control Co., 1200 Soldiers Field, Rd., Boston 34, Mass.—J,F,R,Z  
 General Electric Co., Construction Materials Div., 1285 Boston Ave., Bridgeport 2, Conn.—G,K,U,Z  
 General Electric Co., Trumbull Electric Dept., Woodland Ave., Plainville, Conn.—J,S  
 GENERAL ELECTRIC CO., APPARATUS DIV., 1 River Rd., Schenectady 5, N.Y.—A,F,P,S,U,Y,Z,AAA  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—E  
 Genisco, Inc., 2233 Federal Ave., Los Angeles 64, Calif.—W  
 Giannini & Co., G.M., 590 S. Fair Oaks, Pasadena 2, Calif.—N,V  
 Grayhill, 561 Hillgrove Ave., La Grange, Ill.—E,P,R,U  
 Grigsby-Allison Co., 407 N. Salem Ave., Arlington Heights, Ill.—B,E,P,R,T,U,AB

## LOCALIZER INDEX FINDER

Manufacturers using the LOCALIZER INDEX are listed alphabetically. The LOCALIZER INDEX—an exclusive feature of the 1953 ELECTRONIC INDUSTRIES DIRECTORY—lists local "reps" and branch offices (names, addresses, telephone numbers, territory covered), home telephone numbers, executive personnel, trade names.

**TELE-TECH**  
 & ELECTRONIC INDUSTRIES

GUARDIAN ELECTRIC MFG., CO., 1621 W. Walnut St., Chicago 12, Ill.—A,U,V,X,Y  
 G-V. Controls Inc., 28 Hollywood Plaza, East Orange, N.J.—Y  
 HAMMARLUND MFG. CO., 460 W. 34 St., New York 1, N.Y.—R  
 HART MFG. CO., 110 Bartholomew Ave., Hartford, Conn.—R,Z  
 Healy-Ruff Co., 772 Hampden Ave., St. Paul 14, Minn.—F,N  
 Heineman Electric Co., Penn. Ave. & Plum St., Trenton 2, N.J.—A  
 Hetherington, Inc., Sharon Hill, Pa.—J,P,R,S,T,U,V,Z  
 Hughey & Phillips, P. O. Box 686, Encino, Calif.—K,Y  
 Industrial Timer Corp., 115 Edison Pl., Newark 5, N.J.—Y  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City 1, N.Y.—J, T  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—C,J  
 IQ Industries, 6110 Wilshire Blvd., Los Angeles 36, Calif.—Y  
 I-T-E Circuit Breaker Co., 19 & Hamilton Sts., Philadelphia 30, Pa.—A  
 Janco Corp., 311 Winona Ave., Burbank, Calif.—  
 J-B-T INSTRUMENTS, 441 Chapel St., New Haven, Conn.—J,R,Z  
 JENNINGS RADIO MFG. CO., P. O. Box 1278, San Jose 8, Calif.—A,AA  
 JFD Mfg. Co., 6101 16 Ave., Brooklyn 4, N.Y.—I,J,P,R,T,U,Z  
 KELLOGG SWITCHBOARD & SUPPLY 79 W. Monroe St., Chicago 3, Ill.—I,P,V  
 Kolton Electric Mfg. Co., 123 N.J. Railroad Ave., Newark 5, N.J.—A,J  
 Kulka Electric Mfg. Co., 633 S. Fulton Ave., Mt. Vernon, N.Y.—Z  
 La Pointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—X  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—B  
 Lektra Labs., Inc., 154 11 Ave., New York 11, N.Y.—Y  
 Leland Inc., G.H., 123 Webster St., Dayton 2, Ohio—R,V  
 Littelfuse, Inc., 1865 Miner St., Des Plaines, Ill.—A  
 LogeSound Engineers, J. M., 2171 W. Washington Blvd., Los Angeles 18, Calif.—J  
 Lumenite Electronic Co., 407 S. Dearborn St., Chicago 5, Ill.—Y  
 Lyman Electronic Corp., 12 Cass St., Springfield, Mass.—R  
 Mack Electric Devices, 37 Glenside Ave., Wyncote, Pa.—K,AA  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—E,I,P,R,U,Y  
 Masco Products Co., 2119 S. Sepulveda Blvd., Los Angeles 25, Calif.—R,Y  
 Master Appliance Mfg. Co., Fourth & Ontario Sts., Racine, Wis.—U,Z  
 Mercoird Corp., 4201 Belmont Ave., Chicago 41, Ill.—K,N,AA  
 Mercury Contacts, Inc., P. O. Box 615, Far Hills Station, Dayton 9, Ohio—K  
 Micro Div., Minn.—Honeywell Regulator Co., Freeport, Ill.—K,P,R,S,U,Z  
 Mosley Electronics, 8622 St. Charles Rd., St. Louis 14, Mo.—R  
 Mossman Inc., Donald P., 420 Lexington Ave., New York 17, N.Y.—I,P,Z  
 Muter Co., 1255 S. Michigan Ave., Chicago 5, Ill.—P,T,U  
 MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—W  
 Naer Corp., 11777 Santa Monica Blvd. W., Los Angeles 25, Calif.—Q,R,AA  
 National Electronic Mfg. Corp., 42-08 Vernon Blvd., Long Island City 1, N.Y.—J  
 Network Mfg. Corp., 213 W. 5 St., Bayonne, N.J.—R,Z  
 North Electric Mfg. Co., S. Market St., Gallon, Ohio—I,J,P,S,V,Z  
 Oak Mfg. Co., 1260 Clybourn Ave., Chicago 10, Ill.—P,T,V  
 Ohmite Mfg. Co., 4835 W. Flournoy St., Chicago 44, Ill.—R  
 Paragon Electric Co., 1600 12 St., Two Rivers, Wis.—Y  
 Parts Producing Corp., Manhattan Div., 1861 Second Ave., New York 28, N.Y.—A,C  
 Penta Labs., Inc., 216 N. Milpas St., Santa Barbara, Calif.—AA  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—P,U  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—J,Z  
 Photocircuits Corp., Glen Cove, N.Y.—E,R,T,V  
 Photoswitch Inc., 77 Broadway Cambridge 42, Mass.—Y  
 Pioneer Electric & Research, 743 Circle Ave., Forest Park, Ill.—R  
 Pioneer Electronics Corp., 2232 Broadway, Santa Monica, Calif.—AA  
 Pioneer Patents & Products, 3720 N. New England Ave., Chicago 34, Ill.—O  
 Power Equip. Co., 5740 Nevada E., Detroit 34, Mich.—P  
 PM Industries, Inc., 280 Fairfield Ave., Stamford, Conn.—  
 Premier Instrument Corp., 52 W. Houston St., New York 12, N.Y.—B  
 Radiation Counter Labs., 5122 W. Grove St., Skokie, Ill.—K  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—J,X  
 Recora Co., 56 W. 103 St., Chicago 28, Ill.—Y

Research Instrument Co., 233 Broadway, New York 7, N.Y.—E,I,J,R,T,AA  
 Rhodes, Inc., M.H., 30 Bartholomew Ave., Hartford 6, Conn.—Y  
 Rich Electronics, 212 N.W. 8 Ave., Miami 36, Fla.—AC  
 Ripley Co., 1 Factory St., Middletown, Conn.  
 Rodale Mfg. Co., Emmaus, Pa.—J  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—R  
 Rupp's Assembling & Mfg. Works 2341 N. Seminary Ave., Chicago 14, Ill.—G,J,K,P,Z  
 Saxenburg Potteries, Savonburg, Pa.—A  
 SCINTILLA MAGNETO DIV., BENDIX AVIATION CORP., Sherman Ave., Sidney, N.Y.—R  
 Sears Co., M.J., 52 Clark St., Brooklyn 2, N.Y.—P,U  
 Sessions Clock Co., Tyniswitch Div., E. Main St., Forestville, Conn.—P,S,U  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Colingdale, Pa.—E,P,R,T,AB  
 Sherman Industrial Electronics Co., 505 Washington Ave., Belleville, N.J.  
 SHURE BROS., 225 W. Huron St., Chicago 10, Ill.—P,Z  
 Signal Eng'g & Mfg. Co., 145 W. 14 St., New York 11, N.Y.—B  
 Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y.—J,P,T,U,Z  
 Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.  
 Sperti Faraday, Inc., 1077 Celestial St., Cincinnati 2, Ohio—AA  
 STACKPOLE CARBON CO., Tannery St., St. Marys, Pa.—P,U,T  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—I,V,Y  
 Stromberg-Carlson Co., Rochester 3, N.Y.—V  
 Switchcraft, Inc., 1328 N. Halsted St., Chicago, Ill.—I,P  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—G  
 Tallen Co., 159 Carlton Ave., B'klyn, N.Y.—Y,Z  
 Tech Labs., Inc., 120 Hillcrest Ave., Leonia, N.J.—E,R,AC  
 Telectro Industries, 35-16 37 St., Long Island City 1, N.Y.—I  
 Tele-Matic Industries, Inc., 1 Joralemon St., Brooklyn 2, N.Y.—T,X  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—B  
 Thermo Instruments Co., 166 El Camino Real, Belmont, Calif.—F,N  
 Thompson Clock Co., H.C., 38 Federal St., Bristol, Conn.—A,P,R,T,U,V,X,Y,Z  
 Thompson Products 2196 Clarkwood Rd., Cleveland 3, Ohio—B,R  
 Tork Clock Co., 1 Grove St., Mount Vernon, N.Y.—Y  
 Ucinite Co., Div. United-Carr Fastener Corp., 459 Watertown St., Newtonville, Mass.—P,R,U  
 Ulanet Co., George, 413 Market St., Newark N.J.—X,Y  
 Unimax Switch Div., W. L. Maxson Corp., 460 W. 34th St., New York 1, N.Y.—U  
 United Electric Controls, 85 School St., Wattertown 75, Mass.—N,X,AA  
 Valverde Labs., 253 Lafayette St., New York 12, N.Y.—X  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio—G,Y  
 Victory Eng'g Corp., Springfield Rd., Union, N.J.—Y  
 Vokar Corp., Dexter, Mich.—J,U  
 Walsar Automatic Timer Corp., 420 Lexington Ave., New York 17, N.Y.—Y  
 Ward Leonard Electric Co., 115 MacQuesten Pky., So. Mount Vernon, N.Y.—P,Y  
 Welch Electric Co., 1221 Wade St., Cincinnati 14, Ohio—R  
 Western Electronic Enterprises, 3348 W. Comp-ton Blvd., Gardena, Calif.—B  
 Western Int'l. Co., 45 Vesey St., New York 7, N.Y.—P,T,Z  
 Wilson & Co., G.C., 2 N. Passaic Ave., Chatham, N.J.—Y  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—B,E,P,AA

## 90—TESTERS

Testers, automatic tube ..... A  
 Testers, battery ..... B  
 Testers, capacitor ..... C  
 Testers, cathode ray tube ..... D  
 Testers, circuit ..... E  
 Testers, coating thickness ..... F  
 Testers, coil ..... G  
 Testers, color ..... H  
 Testers, continuity ..... I  
 Testers, crystal ..... J  
 Testers, distortion ..... K  
 Testers, HV breakdown ..... L  
 Testers, insulation ..... M  
 Testers, metallic rectified ..... N  
 Testers, meter ..... O  
 Testers, multitester ..... P  
 Testers, radar tube ..... Q  
 Testers, synchro error ..... R  
 Testers, vacuum tube ..... S  
 Test sets, relay ..... T

Aero Electronics Co., 1512 N. Wells St., Chicago 10, Ill.—C,D,E,F,G,M,R  
 Aerolite Electronics Corp., 507-26 St., Union City, N.J.—G  
 Ahrendt Instrument Co., 4910 Calvert Rd., College Park, Md.—R  
 Airborne Instruments Lab., 160 Old Country Rd., Mineola, N.Y.—J  
 Allied Int'l. Inc., 230 Park Ave., New York 17, N.Y.  
 American Instrument Co., Silver Spring, Md.—F  
 Anko Mfg. Co., 7311 W. Burleigh St., Milwaukee 10, Wisc.—D  
 Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—M  
 Audio Instrument Co., 133 W. 14 St., New York 11, N.Y.—M  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—L  
 Auto-Test, Inc., 600 S. Michigan Ave., Chicago, 5, Ill.—B  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—K  
 Bassett, Inc., R-x, 1314 N.E. 17 Court, Fort Lauderdale, Fla.—J  
 Batson Electronics Corp., J. A., 1031 S. 27 St., Omaha, Nebr.—B,C,E,G  
 BERKELEY SCIENTIFIC, Div. Beckman Instruments, Inc., 2200 Wright Ave., Richmond, Calif.—J  
 BERKSHIRE LABS., 586 Beaver Pond Rd., Lincoln, Mass.—J  
 Beta Electric Corp., 333 E. 103 St., New York 29, N.Y.—L,M  
 Biddle Co., Jas. G., 1316 Arch St., Philadelphia 7, Pa.—L,M  
 BLISS ELECTRONIC CORP., Box 123, Sussex, N.J.—C,E,I,L,M  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—S  
 Booth Co., Arthur E., 265 S. Alexandria Ave., Los Angeles 4, Calif.—O,T  
 Borden Eng'g. Co., 63 Clinton Ave., New Providence, N.J.—I  
 Bracke-Seib X-Ray Co., 293 3 Ave., New York 10, N.Y.—M  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—A,D,G,L,R,S  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—S  
 Bruck Industries, Syosset, L.I., N.Y.—O  
 BRUSH ELECTRONICS CO., 3405 Perkins Ave., Cleveland 14, Ohio—M  
 Buck Eng'g. Co., 37 Marcy St., Freehold, N.J.—S  
 Carbonneau Industries, 100 Lexington Ave., Grand Rapids, Mich.  
 Carlson & Nicholson, 497 Maynard Dr., Buffalo 21, N.Y.—C,D,G  
 Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—L,M,P  
 CBS-Columbia Inc., 170-53 St., Brooklyn 32, N.Y.—S  
 Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—S  
 Chicago Industrial Instrument Co., 536 W. Elm St., Chicago 10, Ill.—B,C,P  
 Clough-Brengle Co., 6014 Broadway, Chicago 40, Ill.—C  
 Coil Winders, Inc., New York Ave., Westbury, L.I.—B,G,I  
 Color Television, Inc., 973 E. San Carlos Ave., San Carlos, Calif.—E,I,M  
 Columbia Technical Corp., 5 E. 57 St., New York 22, N.Y.—G  
 Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J.—L,M  
 Computer Research Corp., 3248 W. El Segundo Blvd., Hawthorne, Calif.—J  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., S. Plainfield, N.J.—C  
 CROSBY LABS, INC., Robbins Lane, Hicksville, N.Y.—F  
 Daven Co., 191 Central Ave., Newark 4, N.J.—K  
 Decade Instrument Co., Box 153, Caldwell, N.J.—J

### EXCLUSIVE LIST OF ELECTRONIC REPRESENTATIVES

This is the only list in any directory devoted exclusively to electronic representatives. Arranged alphabetically according to states and cities, it gives the names and addresses of all independent "reps" throughout the country. It is the most complete and authoritative representatives list ever published.

**TELE-TECH**  
& ELECTRONIC INDUSTRIES

Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—H  
 Diatron, 3327 Dixie Dr., Houston, Texas.—F  
 Dice Co., 1 Engle St., Englewood, N.J.—M  
 Dcelcam Corp., 56 Elmwood St., Newton 58, Mass.—R  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—L,M,P,S  
 DUMONT LABS., INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—D,Q,S  
 Eastern Specialty Co., 3617 N. 8 St., Philadelphia 40, Pa.—L,M  
 Eidson Electronic Co., 1902 N. 3 St., Temple Texas.—J  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—L  
 Electro-Mechanical Instrument Co., 812 Chestnut St., Perkasie, Pa.—B,O  
 Electronic Beam Corp., 923 Old Nepperhan Ave., Yonkers 3, N.Y.—D  
 Electronic Control Corp., 1573 E. Forest Ave., Detroit 7, Mich.—L  
 Electronic Instrument Co., 84 Withers St., Brooklyn 11, N.Y.—C,D,I,P,S  
 Electronic Measurements Corp., 280 Lafayette St., New York 12, N.Y.—S  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—B,C,E,G,I,L,M,O,P,S  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—G  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—L,M  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—E,Q  
 Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, R.I.—D,F,L,M,S  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas.—D,K  
 Espey Mfg. Co., 528 E 72 St., New York 21, N.Y.—A,B,D,E,O,P  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—A,B,C,D,E,I,O,P,S  
 Fordham Mfg. Co., 2220 Pearsall Ave., New York 69, N.Y.  
 FREED TRANSFORMER CO., 1718 Wirfield St., Brooklyn 27, N.Y.—M  
 Gardner Lab. Inc., Henry A., 4723 Elm St., Bethesda 14, Md.—F  
 GENERAL ELECTRIC CO., APPARATUS DIV., 1 River Rd., Schenectady 5, N.Y.—F, G,M,Q  
 GENERAL ELECTRIC CO., Electronic Park, Syracuse, N.Y.—S  
 General Electronics Inc., 32 W. 22 St., New York 10, N.Y.—D,S  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—M,S  
 GULTON MFG. CORP., Metuchen, N.J.—C, S  
 Heyer Products Co., 471 Cortlandt St., Belleville 9, N.J.—B  
 HICKOK ELECTRICAL INSTRUMENT CO., 10514 Dupont Ave., Cleveland 8, Ohio—B, S  
 Holtzer Cabot Div., Nat'l. Pneumatic Co., 125 Armory St., Boston 19, Mass.—M  
 Holub Industries, 413 DeKalb Ave., Sycamore, Ill.—E  
 Hoyt Electrical Instrument Works, 292 Main St., Cambridge 42, Mass.—B  
 Ideal Industries, 3316 Park Ave., Sycamore, Ill.—E  
 Industrial Instruments, Inc., 89 Commerce St., Cedar Grove, N.J.—L  
 Industrial Test Equip. Co., 55 E 11 St., New York 3, N.Y.—C,G,L,R  
 Industrial Transformer Corp., Gouldsboro, Pa.—M  
 Instrument Devel. Labs., 163 Highland Ave., Needham 94, Mass.—H  
 Instrument Labs., 315 Walton Pl., Chicago, Ill.—E,L,O,P  
 Inter Electronics Corp., 2432 Grand Concourse, New York 58, N.Y.—B  
 Jackson Electrical Instrument Co., 20 S. Patterson Blvd., Dayton 2, Ohio.—C,D,Q,S  
 Kapner Hardware, 2248 2 Ave., New York 29, N.Y.—E  
 Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, Ohio.—M  
 KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—R  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—I  
 Kocour Co., 3504 W. 48 Pl., Chicago 32, Ill.—F  
 Krouse Testing Machine, Inc., 573 E. 11 Ave., Columbus 3, Ohio.—F  
 L.A.B. Corp., 31 Union Pl., Summit, N.J.—L  
 Lee Electronic Labs., Inc., 233 Dudley St., Boston 19, Mass.—B,C,P  
 Lloyd's Enterprises, Box 313, Altadena, Calif.  
 Lyman Electronic Corp., 12 Cass St., Springfield, Mass.—I,M  
 McColpin-Christie Corp., 3410 W. 67 St., Los Angeles 43, Calif.—B  
 MacLeon & Hanopol, 10 Roland St., Charlestown 29, Mass.—S  
 Magnex Corp., 902-28 Van Wyck Expressway, Jamaica 18, L.I., N.Y.—L  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—C  
 Manson Labs., 207 Greenwich Ave., Stamford, Conn.—M,Q,S  
 Marion Electrical Instrument Co., 400 Canal St., Manchester, N.H.—O  
 Mercury Electronic Co., Box 450, Red Bank, N.J.—L  
 Mercury Electro-Products, Inc., 622 W. Kinzie St., Chicago 10, Ill.—S  
 Metropolitan Electronics & Instruments Co., 106 5 Ave., New York 11, N.Y.—A,B,C,P,S  
 Micro Balancing, Inc., 191 Herricks Rd., Garden City Park, N.Y.



MICROWAVE ASSOCIATES, 22 Cummington St., Boston 15, Mass.—J  
 Mil Instrument Corp., 92-15 172 St., Jamaica 33, L.I., N.Y.—D,L,O,P,S  
 Miller Labs., A. E., 9226 Hudson Blvd., N. Bergen, N.J.—J  
 MILLIVAC INSTRUMENT CORP., 444 2 St., Schenectady, N.Y.—E,J,M,S  
 Moulie Specialties Co., 1005 W. Washington St., Bloomington, Ill.—E  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—D,H,L,S  
 Naer Corp., 11777 Santa Monica Blvd., W. Los Angeles 25, Calif.—D  
 National Capacitor Co., 585 Washington St., Quincy 69, Mass.—C  
 National Union Radio Corp., Jacksonville Rd., Hatboro, Pa.—D  
 North American Philips Co., 750 Fulton Ave., Mount Vernon, N.Y.—J  
 Oak Ridge Products Div., Video TV Inc., 92-15 172 St., Jamaica 33, L.I., N.Y.—D,L,O,P,S  
 Ohmart Corp., 2347 Ferguson Rd., Cincinnati 38, Ohio.—F  
 Panoramic Radio Products, 10 S. 2 Ave., Mt. Vernon, N.Y.—K  
 Penna Testing Lab., Doylestown, Pa.—C,G,R,S  
 Peschel Electronics, 13 Garden St., New Rochelle, N.Y.—E,I,L,M  
 PHAOSTRON CO., 151 Pasadena Ave., S. Pasadena, Calif.—O  
 Precise Devel. Corp., 999 Long Beach Rd., Oceanside, N.Y.—S  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—L,M  
 Precision Apparatus Co., 92-27 Horace Harding Blvd., Elmhurst, L.I., N.Y.—D,P,S  
 Precision Associates, 354 Cumberland St., Brooklyn 17, N.Y.—B  
 Radar-Electronics Inc., 229 W 28 St., New York 1, N.Y.—B  
 Radio City Products Co., 152 W. 25 St., New York 1, N.Y.—B,D,E,P,S  
 RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—D,S  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—D,S  
 Rawson Electrical Instrument Co., 117 Potter St., Cambridge 42, Mass.—O  
 Remco Mfg. Co., 545 N. La Salle St., Chicago 10, Ill.  
 Research Electronics Labs., Roslyn, Pa.—D, Q,S  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—C  
 Rich Electronics, Inc., 212 N. W. 8 Ave., Miami 36, Fla.—L  
 Rockwell Eng'g. Co., 4063 N. New Jersey St., Indianapolis, 5, Ind.—L,M  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—E,I,L,M  
 Rowe Industries, 1702 Wayne St., Toledo 9, Ohio.—L,M  
 Schauer Mfg. Co., 4500 Alpine Ave., Cincinnati, 36, Ohio.  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio.—L  
 Service Instruments Inc., 422 S. Dearborn St., Chicago 5, Ill.  
 SHALLCROSS MFG. CO., 520 Pusey Ave., Collingdale, Pa.—C,E  
 Sierra Electronics Corp., 1050 Brittan Ave., San Carlos, Calif.—K  
 Simpson Electric Co., 5208 W. Kinzie St., Chicago 44, Ill.—B,C,P,S  
 Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—G,L,M  
 Southwestern Industrial Electronics, 2831 Post Oak Rd., Houston, Texas.—C,M  
 Specialty Assembling & Packing Co., 79 Clifton Pl., Brooklyn 38, N.Y.—P  
 SPRAGUE ELECTRIC CO., 233 Marshall St., North Adams, Mass.—C  
 Standard Electronic Research Corp., 2 East End Ave., New York 21, N.Y.—F  
 Star Fuse Co., 235 Canal St., New York 13, N.Y.—E  
 Sterling Mfg. Co., 7201 Wentworth Ave., Cleveland 2, Ohio.—B  
 Sticht Co., Herman H., 27 Park Pl., New York, N.Y.—M  
 Sturtevant Co., Addison, Ill.  
 Supreme, Inc., Greenwood, Miss.—B,S  
 SYLVANIA ELECTRIC PRODUCTS, Inc., 1740 Broadway, New York 19, N.Y.—D,S  
 Syntronic Instruments, Inc., 100 Industrial Rd., Addison, Ill.—D,Q  
 TELECHROME, INC., 88 Merrick Rd., Amityville, N.Y.—H, M  
 Telectro Industries Corp., 35-16 37 St., Long Island City 1, N.Y.—J  
 Teletronics Labs., 54 Kinkel St., Westbury, L.I., N.Y.—J,S  
 Telex, Inc., 1633 Eustis St., St. Paul 1, Minn.—B  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—B,C,E,G,I,O

Tinker & Rasor, P O Box 281, San Gabriel, Calif.—M  
 Transistor Products Inc., 55 Union St., Brighton 35, Mass.—S  
 Triplett Electrical Instrument Co., Harmon Rd., Bluffton, Ohio.—B,P,S  
 Triumph Mfg. Co., 913 W. Van Buren, Chicago 7, Ill.—B  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—R  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—G, R  
 UNIVERSAL AVIATION EQUIP. INC., 187 Lafayette St., New York 13, N.Y.—F  
 Vacolite Co., 3003 N. Henderson St., Dallas 6, Texas.—S  
 Vacuum Electronic Eng'g. Co., 86 Denton Ave., New Hyde Park, L.I., N.Y.  
 Valtronics, Inc., 242 Valley St., Dayton 4, Ohio.—P,S  
 Vector Electronic Co., 3352 San Fernando Rd., Los Angeles 65, Calif.—S  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—R  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio.—O  
 Vidaire Electronics Mfg. Co., 576 W. Merrick Rd., Lynbrook, L.I., N.Y.—D  
 Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—A,B,C,E,O,S  
 Walkirt Co., 145 W. Hazel St., Inglewood 3, Calif.—M  
 Welch Electric Co., 1221 Wade St., Cincinnati 14, Ohio.—E,M  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—B,E,G,O, P,S  
 Weston Labs., Inc., Oak Hill Rd., Harvard, Mass.—L,M,S  
 Willard Storage Battery Co., 1220 Huron Rd., Cleveland, Ohio.—B  
 Wood Co., Ash, M., 11938 E. Garvey Blvd., El Monte, Calif.—K  
 Yonkers Industries, Inc., 28 School St., Yonkers, N.Y.—P,S

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 Demagnetizers ..... E  
 Drills, electric ..... F  
 Drills, hand ..... G  
 Drills, twist ..... I  
 Drivers, staple ..... H  
 Etchers, electric ..... J  
 Files ..... K  
 Gages ..... L  
 Hammers ..... M  
 Holders, Chassis ..... N  
 Knob pullers ..... O  
 Lenses, inspection ..... P  
 Micrometers ..... Q  
 Mirrors, inspection ..... R  
 Pliers ..... S  
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 Scales & Tapes ..... V  
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 Screwdrivers ..... X  
 Socket wrenches ..... Y  
 Solder pots ..... Z  
 Soldering irons ..... AA  
 Soldering iron stands ..... AB  
 Soldering iron tips ..... AC  
 Splicing tools ..... AD  
 Tube pin straighteners ..... AE  
 Tube pullers ..... AF  
 Wire strippers ..... AG  
 Vices ..... AH

Acme Electric Heating Co., 1217 Washington St., Boston 18, Mass.—Z  
 Acme Industrial Co., 200 N. Leflin St., Chicago 7, Ill.—Q  
 Acromark Co., 9 Morrell St., Elizabeth 4, N.J.—J  
 Acro Tool & Die Works, 4554 Broadway, Chicago 40, Ill.—N  
 Advance Electronics Co., 8510 North End Ave., Oak Park 37, Mich.—R  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—A  
 Airdraulics Eng'g., Inc., 30 Burtis Ave., New Canaan, Conn.—L,V,X  
 Alina Corp., 401 Broadway, New York 13, N.Y.—Q  
 American Electrical Heater Co., 6110 Cass Ave., Detroit 2, Mich.—AA,AB,AC,AH  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—A  
 American Radio Hardware Co., 152 MacQuestion Parkway S., Mount Vernon, N.Y.—A, X,Y  
 Annis Co., R. B., 1101 N. Delaware St., Indianapolis 2, Ind.—E,J

Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—N  
Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—E  
Bowen & Co., 4712 Bethesda Ave., Bethesda, Md.—R,V  
Brillhart Plastic Corp., Box 31, Old Country Rd., Mineola, L.I., N.Y.—A  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—A,O,AE,AF  
Buchanan Electrical Products Corp., 236 Route 22, Hillside, N.J.—AD  
Chicago Tool & Eng'g. Co., 8383 S. Chicago Ave., Chicago 17, Ill.—AH  
Cleco Div., Reed Roller Bit Co., 5125 Clinton Dr., Houston 20, Texas—M,X  
Contact, Inc., 238 Main St., Cambridge 42, Mass.  
Cummins-Chicago Corp., 4740 Ravenswood Ave., Chicago 40, Ill.—F  
Curran Machine Works, 20-20 Steinway St., Long Island City, N.Y.—L  
Dante Electric Mfg. Co., P.O. Box 6, Bantam, Conn.  
Dee Electric Co., 1101 N. Paulina St., Chicago 22, Ill.—Z  
Delaware Optical Labs., 36 Williams St., Lansdowne, Pa.—P,R  
Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.—M  
DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill.—B,I,K,L,M,P,Q,AH  
Duro Specialty Co., 8 Bennett St., Lynn, Mass.—AE  
Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—F  
Enthoven Solders Ltd., 107 N. Water St., Rochester 4, N.Y.—A,Z,AA,AC  
FAIRCHILD INDUSTRIES DIV. Fairchild Camera & Instrument Corp., 110 Main St., Burlington, Vt.—F  
Federal Sapphire Products, Div. Precision Supply & Machine Co., 12 River Rd., Fair Lawn, N.J.—I,L,Q,X  
Federal Screw Products Inc., 224 W. Huron St., Chicago 10, Ill.—AC  
Forsberg Mfg. Co., 125 Seaview Ave., Bridgeport 1, Conn.—G,H,M,X  
General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—A,N,O,R,T,X,AC,AE,AF,AG  
GENERAL ELECTRIC CO., Schenectady 5, N.Y.—AA  
Greibach Research & Devel. Labs., 80 Pryer Terrace, New Rochelle, N.Y.—Z,AA  
Grenlee Tool Co., 2136 12 St., Rockford, Ill.—T,X  
Gustafson Mfg. Co., G. D., 5328 N. Kedzie Ave., Chicago 25, Ill.  
Hexacon Electric Co., 157 N. Clay Ave., Roselle Park, N.J.—AA,AB  
Holub Industries, 413 DeKalb Ave., Sycamore, Ill.—AG  
Ideal Industries, 3316 Park Ave., Sycamore, Ill.—E,J,M,AA,AG  
Industrial Engineered Products Co., 7416 Melrose Ave., Los Angeles 46, Calif.—Z,AA,AL  
INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City, N.Y.—C,AA,AC,AF  
JFD Mfg. Co., 6101 16 Ave., Brooklyn 4, N.Y.—N,AA,AG  
Kelnor Mfg. Corp., 222 Kearny St., San Francisco 8, Calif.—AA  
Keystone Electronics Corp., 423 Broome St., New York 11, N.Y.—A  
Kinetix Instrument Co., 902 Broadway, New York 10, N.Y.  
KLEIN & SONS, MATHIAS, 3200 Belmont Ave., Chicago 18, Ill.—D,S,W,AD,AG  
Kwikheat Mfg. Co., 3732 San Fernando Rd., Glendale 4, Calif.—Z,AA,AB  
Lectrohm, Inc., 5560 Northwest Highway, Chicago 30, Ill.—Z  
Lenk Mfg., 30 Cummington St., Boston 15, Mass.—AA,AC  
Lufkin Rule Co., 1730 Hess St., Saginaw, Mich.—Q  
Luma Electric Equip. Co., 1112 Dorr St., Toledo, Ohio—E,J  
Metzger & Son, E. F., 2600 N. 6 St., Philadelphia 33, Pa.—A  
MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass.—C, J  
Mills Falls Co., Greenfield, Mass.—B,C,G,J, Q,X  
Mitchell Industries, Box 17, Mineral Wells, Texas—AA,AB,AC  
Phillips Mfg. Co., 2816 Aldrich Ave., S., Minneapolis, Minn.—AA,AB,AC,AI  
Pioneer Tool Co., 5008 W. Jefferson Blvd., Los Angeles 16, Calif.—C,T,Y  
Portable Electric Tools, 200 W. 83 St., Chicago 20, Ill.—F  
Porter, Inc., H. K., 74 Foley St., Somerville 43, Mass.—D,S,X,Y  
Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.—C  
Precision Supply & Machine Co., 12 River Rd., Fair Lawn, N.J.—I,J,K,L,Q  
Production Tool & Fixture Co., 37 W. Main St., Oyster Bay, N.Y.—AE  
Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—AF  
Ryerson & Son, Joseph T., Box 8000-A, Chicago 80, Ill.—B,F  
Saratoga Industries, Ballston Ave., Saratoga Springs, N.Y.—AG  
Sittler Corp., 18 N. Ada St., Chicago 7, Ill.—AG  
Size Control Co., 2500 W. Washington Blvd., Chicago 12, Ill.—L,Q

Smith, Inc., Herman H., 436 18 St., Brooklyn 15, N.Y.—A  
Specialty Assembling, 79 Clifton Pl., Brooklyn 38, N.Y.—A,K,AF  
Star Expansion Products Co., 147 Cedar St., New York 6, N.Y.—A,F,G,AE  
Star Fuse Co., 235 Canal St., New York 13, N.Y.  
Sturtevant Co., P. A., Addison, Ill.—Y  
Sunrise Products Co., P. O. Box 173, Hawthorne, N.J.—Z,AA,AB  
Technicraft Supply Co., 1156 Commonwealth Ave., Boston 34, Mass.—AA  
Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—A, B, C, D, F, G, I, J, K, M, O, P, Q, R, S, T, U, V, W, X, Y, AA, AB, AC, AD, AE, AF, AG, AH, AI  
Ungar Electric Tools, 4101 Redwood, Venice, Calif.—AA,AC  
Utica Drop Forge & Tool Corp., 2415 Whitesboro St., Utica 4, N.Y.—S,W,X  
Vaco Products Co., 317 E. Ontario St., Chicago 11, Ill.—A,X,Y,AG  
Vulcan Electric Co., 88 Holten St., Danvers, Mass.—Z,AA,AB,AC  
Waage Electric, Inc., 720 Colfax Ave., Kenilworth, N.J.—Z  
Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—A  
WALL MFG. CO., Grove City, Pa.—AA  
Wasserlein Mfg. Co., 126 W. Cass St., Joliet, Ill.—AA,AC  
Weller Electric Corp., 808 Packer St., Easton, Pa.—AA  
Wen Products, Inc., 5806 N. West Highway, Chicago 31, Ill.—AA  
Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—J  
WHITE DENTAL MFG. CO., S. S., 10 E. 40 St., New York 16, N.Y.—J  
Whittaker Cable Corp., 1301 Burlington Ave., N. Kansas City 16, Mo.—AG  
Wiedemann Machine Co., 4272 Wissahickon Ave., Philadelphia 32, Pa.—T  
Xcelite Inc., Thorne Ave. & Bank St., Orchard Park, N.Y.—A,S,X,Y

## 92—TRANSFORMERS

**Transformers, audio broadcasting** .A  
**Transformers, audio receiving** . . . . B  
**Transformers, autotransformer** . . . . C  
**Transformers, bias** . . . . . D  
**Transformers, bridge** . . . . . E  
**Transformers, current** . . . . . F  
**Transformers, current limiting** . . . . G  
**Transformers, filament** . . . . . H  
**Transformers, flyback** . . . . . AF  
**Transformers, fluorescent** . . . . . I  
**Transformers, HV fence** . . . . . J  
**Transformers, instrument** . . . . . K  
**Transformers, isolation** . . . . . L  
**Transformers, laminations** . . . . . M  
**Transformers, microphone cable** . . . . N  
**Transformers, microwave** . . . . . O  
**Transformers, modulation** . . . . . P  
**Transformers, plate** . . . . . Q  
**Transformers, plug-in** . . . . . R  
**Transformers, power** . . . . . S  
**Transformers, power receiving** . . . . T  
**Transformers, power transmitting** . . . U  
**Transformers, pulse** . . . . . V  
**Transformers, RF-IF** . . . . . W  
**Transformers, saturable** . . . . . X  
**Transformers, subsonic** . . . . . Y  
**Transformers, toroidal** . . . . . Z  
**Transformers, TV antenna matching** . . . . . AA  
**Transformers, ultrasonic** . . . . . AB  
**Transformers, variable** . . . . . AC  
**Transformers, voltage, regulating** AD  
**Transformers, welding** . . . . . AE

Abalon Precision Mfg. Corp., 540 Casanova St., Bronx 59, N.Y.—M  
Accurate Eng'g. Co., 2005 Blue Island Ave., Chicago 8, Ill.—H,L,Q,S  
Ace Coil & Electronics Co., 914 Middlesex Ave., Metuchen, N.J.—W  
Acme Electronics, Inc., 300 N. Lake Ave., Pasadena 4, Calif.—B, C, D, E, H, K, L, P, Q, R, S, T, V, W, X, Y, Z, AB, AD, AF  
Acme Electric Corp., Water St., Cuba, N.Y.—A, B, C, F, G, H, I, K, L, P, Q, S, T, U, V, X, Y, AC, AD  
Acorn Electronics Corp., Box 348 Gibson City, Ill.—B, C, D, H, I, J, L, Q, T, V  
Acro Transformer & Mfg. Corp., 26-02 4 St., Long Island City 3, N.Y.—A, B, C, D, G, H, L, P, Q, R, S, T, U  
AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—A, B, Z  
Aircraft Armaments, Inc., 4415 Reistertown Rd., Baltimore 15, Md.—V  
AIRCRAFT TRANSFORMER CORP., West & Willow Aves., Long Branch, N.J.—A, B, D, E, F, G, H, K, L, O, P, Q, R, S, T, U, V, X, Y, AB, AD

AIRDESIGN, INC., 241 Fairfield Ave., Upper Darby, Pa.—A, B, C, F, G, H, K, L, Q, S, T, U, V, X, AD  
Airtax Products Co., P. O. Box 137, Baltimore 20, Md.—A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AB, AC, AD, AE  
A. J. F. Industries 852 Monroe St., Brooklyn 21, N.Y.—A, B, C, D, G, H, K, L, N, P, Q, R, S, T, U, V  
Allied Allegrì Machine Co., 141 River Rd., Nutley 10, N.J.—W  
American Radionic Co., 33 Flatbush Ave., Brooklyn 17, N.Y.—I  
Amplifier Corp. of America, 398 Broadway, New York 13, N.Y.—B, C, H, L, S, T, AD  
ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—L  
Annis, R. B. Co., 1101 N. Delaware St., Indianapolis 2, Ind.—F, K  
Antara Chemicals Div., General Dyestuff Corp., 435 Hudson St., New York 14, N.Y.—M  
A. P. W. Co., 72 W. Main St., Rockaway, N.J.—Z  
Arma Corp., Roosevelt Field, Garden City, N.Y.—S  
ARNOLD ENGINEERING CO., Marengo, Ill.—M  
Artled Co., 367 Worthington St., Springfield 3, Mass.—B, O, W  
Art Specialty Co., (Flexo Int. Corp. Sub.), 32 W. Lake St., Chicago 24, Ill.—I  
Associated Research Inc., 3758 W. Belmont Ave., Chicago 18, Ill.—K, Z  
Atlas Coil Winders, Inc., 39 Manhattan St., Stamford, Conn.—C, D, E, F, G, H, K, S, T, U, V, W, X, Y, AB, AC, AD  
Audio Devel. Co., 2833 13 Ave., S., Minneapolis 7, Minn.—A, B, C, D, E, H, L, P, Q, R, S, T, U, V, Y, AB  
Audio & Video Products Corp., 730 5 Ave., New York 19, N.Y.—A  
Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N.J.—W  
Auto-Test, Inc., 600 S. Michigan Ave., Chicago 5, Ill.—C, H, Q, S  
Barker & Williamson, Inc., 237 Fairfield Ave., Upper Darby, Pa.—W, Z, AC  
Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—E, H, T, U, AE  
Basler Electric Co., 1005 Olive St., Highland, Ill.—C, H, L, P, Q, R, S, T, U, X, AC, AD  
Bayside Watch Tool Co., 20-02 Utopia, Whitestone 57, L.I., N.Y.—K  
BERKSHIRE LABS., 586 Beaver Pond Rd., Lincoln, Mass.—R, V  
Best Mfg. Co., 1200 Grove St., Irvington 11, N.J.—B  
Bitterman Electric Co., Barlow & Grove Sts., Canaan, Conn.—C, H, K, S, X, Z  
Bogen Co., David, 29 9 Ave., New York 14, N.Y.—B  
Bracke-Seib X-Ray Co., 293 3 Ave., New York 10, N.Y.—M  
Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—S, T  
Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles 34, Calif.—V  
Burnell & Co., Yonkers 2, N.Y.—Z  
Calbest Eng'g. & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—W  
Caledonia Electronics & Transformer Corp., P. O. Drawer 298, Caledonia, N.Y.—A, S  
Carad Corp., 93 Leland Ave., San Francisco 28, Calif.—V, W  
Central Coil Co., 1720 N. Luet St., Indianapolis 22, Ind.—B, C, H, K, L, S, T, W  
Central Transformer Co., 910 W. Jackson Blvd., Chicago 7, Ill.—A, B, C, D, E, G, H, J, L, O, P, Q, S, T, U, X, Y, AB, AC, AE, AF  
C.G.S. Labs. Inc., 391 Ludlow St., Stamford, Conn.—W, X, Z  
Chicago Electronic Eng. Co., 3223 Armitage Ave., Chicago 47, Ill.—B, D, F, G, H, K, Q, S, T, U, V, X, Z  
Chicago Transformer, Div. Essex Wire Corp., 3501 Addison St., Chicago 18, Ill.—A, B, C, D, F, H, K, L, P, Q, S, T, U, V, X, Y, Z, AB, AF  
Carol Electronics Corp., 141 E. 25 St., New York 10, N.Y.—A, B, C, D, E, F, G, H, J, L, N, P, Q, R, S, T, U, V, X, Y, AB, AE  
Coast Coil Co., 5352 W. Wash. Blvd., Los Angeles 16, Calif.—Z  
Coil Eng'g. & Mfg. Co., Roanoke, Ind.—B, C, H, I, J, L, Q, T  
Coil Winders, Inc., New York Avenue, Westbury, L.I., N.Y.—W, Y  
Columbia Process Co., State & Maple Sts., Columbus, Ind.  
Communication Accessories Co., Hickman Mills, Mo.—V, X, Z, AB  
Communication Parts, 7215 W. Irving Park Rd., Chicago 34, Ill.—X, Z  
Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—Z  
Corning Glass Works, P. O. Box 544, Corning, N.Y.—W  
Cox & Co., 115 E. 23 St., New York, N.Y.  
Crest Transformer Corp., 1834 W. North Ave., Chicago 22, Ill.—A, B, C, D, E, H, J, K, L, P, Q, R, S, T, U, V, W, X, AC, AD, AE, AF  
DeMornay-Bonardi, Inc., 3223 Burton Ave., Burbank, Calif.—O  
Delco Radio Div., General Motors Corp., Kokomo, Ind.—B, S, W, AF  
Delta Electronics, Inc., Div. of Electronic Indicator Corp., 259 Green St., Brooklyn 22, N.Y.—B, W  
Delta Radio Co., 115 Worth St., New York 13, N.Y.—W, Z

DeCoursey Eng'r. Lab., P. O. Box 235, Los Angeles 25, Calif.—Z  
 Deutschmann Corp., Tobe, Providence Hwy., Norwood, Mass.—Z  
 Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—O  
 Dietz Design & Mfg. Co., Grandview, Mo.—B,C,H,M,R,S,T,V,W,X,Z  
 DIT-MCO, Inc., 505 W. 9 St., Kansas City 5, Mo.—B,C,D,F,H,L,S,T  
 Dormitzer Electric & Mfg. Co., 5 Hadley St., Cambridge 40, Mass.—B,C,H,Q,S,T,U,V  
 D & R, Ltd., 402 E. Gutierrez St., Santa Barbara, Calif.—K  
 Dresser Electric Co., 942 E. Larned St., Detroit 7, Mich.—E,S  
 Dunkle Coil Co., 3257 W. 6 St., Los Angeles, Calif.—B,C,H,W,AF  
 DX RADIO PRODUCTS INC., 2300 W. Armitage Ave., Chicago 47, Ill.—Z  
 Electran Mfg. Co., 1901 Clybourn Ave., Chicago 14, Ill.—S,X  
 Electrical Windings, Inc., 2015 N. Kolmar Ave., Chicago 39, Ill.—A,B,C,D,E,F,G,H,J,K,L,P,Q,R,S,T,U,V,W,X,Y,AB,AF  
 Electro Assemblies Inc., 2935 W. Belmont Ave., Chicago 18, Ill.—W  
 Electro Engineering Works, 6021 College Ave., Oakland 18, Calif.—A,B,C,D,E,F,G,H,K,L,P,Q,S,T,U,V,X,AD,AE  
 Electrometric Inc., Woodstock, Ill.—V,W  
 Electronic Components Corp., 835 N. Larrabee St., Chicago 10, Ill.—A,B,T,U  
 Electronic Computer Corp., 265 Butler St., Brooklyn 17, N.Y.—V  
 Electronic Heating Corp., 66 Ncedham St. Newton Highlands 61, Mass.—S  
 Electronic Transformer Co., 209 W. 25 St., New York, N.Y.—A,B,C,D,E,F,G,H,K,L,P,Q,R,S,T,U,V,X,Y,AB,AD  
 Electrons Inc., 127 Sussex Ave., Newark 4, N.J.—AC  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—O,W,Z  
 Electro-Tech Equip. Co., 308 Canal St., New York, N.Y.—C,K,L,S,AC,AD,AE  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—A, B, C, D, E, F, G, H, I, K, L, P, Q, R, S, T, U, V, W, X, Y, Z, AB, AD  
 Empire Coil Co., Beechwood Ave., & 2 St., New Rochelle, N.Y.—A, B, C, D, H, J, L, P, Q, R, S, T, U, V, X, Y  
 Eng'g. Research Associates, Inc., Div. Remington Rand, Inc., 1902 W. Minnehaha Ave., St. Paul 4, Minn.—V  
 Entwistle Co., James L., 1475 Elmwood Ave., Providence 7, R.I.—J  
 Epco Products, Inc., 2500 Atlantic Ave., Brooklyn 7, N.Y.—A, B, C, D, E, H, L, P, Q, S, T, U, V, X, Y, AE  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—A, B, M, P, Q, R, S, T, U, W  
 ERCA Tool Die & Stamping Co., 19 Ash St., Brooklyn 22, N.Y.—M  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A, B, C, D, E, F, G, H, K, L, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AB, AC, AD  
 Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis 6, Ind.—F,K  
 FAIRCHILD RECORDING EQUIP. CORP., 154 St. & 7 Ave., Whitestone, L.I., N.Y.—A  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—B  
 Ferranti Electric Inc., 30 Rockefeller Plaza, New York 20, N.Y.—A,B,C,D,E,H,L,P,Q,R,S,T,U,X,Y,AB,AD  
 Ferrocube Corp., Saugerties, N.Y.—M  
 FREED TRANSFORMER CO., 1718 Weirfield St., Brooklyn 27, N.Y.—A,B,C,D,E,F,G,H,J,K,L,P,Q,R,S,T,U,V,X,Y,Z,AB,AE,AF  
 Frost & Co., L. H., 44 Ionia Ave., S.W. Grand Rapids 2, Mich.—A,B,S  
 FUGLE-MILLER LABS., 398 Main St. Metuchen, N.J.—W  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—W  
 Gardner Electric Mfg. Co., 4227 Hollis St., Emeryville 8, Calif.—I,S  
 Gates & Co., Geo. W., Hempstead Tpke. & Lucille Ave., Franklin Square, L.I., N.Y.—I  
 GENERAL CERAMICS & STEATITE CORP., Keasbey, N.J.—M  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—D,G,H,K,L,M,O,P,Q,V,W,X,Z,AC,AD,AE  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—H,U,V,AF  
 General Electrosonics, Inc., 32 W. 22 St., New York 10, N.Y.—C,H,T,Z,AB  
 General Instrument Corp., 829 Newark Ave., Elizabeth 3, N.J.—B,C  
 General Magnetics, Inc., 135 Bloomfield Ave., Bloomfield, N.J.—X  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—B,C,E,Z,AC  
 General Transformer Co., 1824 S. Harwood Ave., Homewood, Ill.—A,B,C,D,G,H,J,L,P,Q,R,S,T,U,X  
 Geotronic Labs., Inc., 1314 Cedar Hill Ave., Dallas 11, Texas—B,C,K,P,X,Y  
 GERTSCH PRODUCTS, INC., P. O. Box 13856 W. Los Angeles 25, Calif.—C  
 Goslin Electric & Mfg. Co., 2921 W. Olive Ave., Burbank, Calif.—A, B, C, D, E, F, G, H, K, L, P, Q, S, T, U, V, W, X, Y, AB, AC, AD  
 Gramer Transformer Corp., 2734 N. Pulaski Rd., Chicago 39, Ill.—A,B,C,F,H,J,L,P,Q,S,T,U,AC,AD,AF

# ELECTRONIC INDUSTRIES DIRECTORY

GUTHMAN & CO., EDWIN I., 15 S. Throop St., Chicago 7, Ill.  
 G. W. Associates, P. O. Box 2263, El Segundo, Calif.—O  
 Halldorson Transformer Co., 4500 N. Ravenswood Ave., Chicago 40, Ill.—A,B,C,D,E,F,H,K,L,P,Q,S,T,U,AC,AD,AF  
 Hall Mfg. Co., 3901 Wesley Terr., Schiller Park, Ill.—X,Z  
 Harmon Electronics Co. 11431 Trumen Rd., Independence, Mo.—R,W  
 Helder Mfg. Corp., 225 Belleville Ave., Bloomfield, N.J.—M  
 Hevi Duty Electric Co., 4212 W. Highland Blvd., Milwaukee 1, Wisc.—C,F,K,S,T,X,AC  
 Highland Eng'g. Co., Main & Urban Sts., Westbury, N.Y.—A, B, C, D, E, F, G, H, J, K, L, N, P, Q, R, S, T, U, V, W, X, Z, AE  
 Hillburn Electronic Products 55 Nassau Ave., Brooklyn 22, N.Y.—W,AF  
 Hindle Transformer Co., Woods Church Rd., Flemington, N.J.—A, B, C, D, E, F, G, H, K, L,N,P,Q,R,S,T,U,V,W,X,AB,AE  
 HI-Q DIV. AEROVOX CORP., Olean, N.Y.—A,B,Z  
 Hollingsworth Corp. John R., Clifton Heights, Pa.—AF  
 Hull & Co., R. O., 1300 Parsons Ct., Rocky River, Ohio—S  
 Hycor Co., 11423 Vanowen St., N. Hollywood, Calif.—Z  
 Industrial Electronics Co., Hanover St., Hanover, Mass.—H,S  
 Industrial Transformer Corp., Gouldsboro, Pa.—A, B, C, D, E, F, G, H, I, J, K, L, N, O, P, Q, R, S, T, U, V, X, Z, AC, AD, AE, AF  
 Instrument Labs., 315 W. Walton Pl., Chicago, Ill.—F,K  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—B  
 Irvington Varnish & Insulator Co., 6 Argyle Terrace, Irvington 11, N.J.—M  
 I-T-E Circuit Breaker Co., 19 & Hamilton Sts., Philadelphia 30, Pa.—F  
 Jacobs Instrument Co., 4718 Bethesda Ave., Bethesda 14, Md.—V,Z  
 Jefferson Electric Co., 910 S. 25 St., Bellwood, Ill.—S,V  
 Jobbins Electronic Enterprises, 1358 Hollyburne Ave., Menlo Park, Calif.—C,G,H,L,P,Q,S,T,U,V,X  
 Johnson Electronics, P. O. Box 2023, Orlando, Fla.—V,W,X,Z,AC  
 Johnson Labs., Div. of Aladdin Industries, Inc., Willard Rd., Norwalk, Conn.—W  
 KELLOGG SWITCHBOARD & SUPPLY, 79 W. Monroe St., Chicago 3, Ill.  
 KENYON TRANSFORMER CO., 840 Barry St., Bronx 59, N.Y.—A, B, C, D, E, G, H, K, L, P,Q,R,S,T,U,V,Y,Z,AB,AF  
 KETAY MFG. CORP., 555 Broadway, New York 12, N.Y.—X,Z  
 Keystone Products Co., Union City 2, N.J.—S  
 Kinetix Instrument Co., Inc., 902 Broadway, New York 10, N.Y.—S  
 K-V Transformer Corp., 20 E. Franklin St., Danbury, Conn.—A, B, C, D, H, L, M, O, P, Q, S, T, U, V  
 Lab. for Electronics, Inc., 75 Pitts St., Boston, Mass.—A,K,Q,S,T,U,V  
 LANGEVIN MFG. CORP., 37 W. 65 St., New York 23, N.Y.—A,C,E,H,L,P,Q,S,U,V  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—P  
 Lee Electric & Mfg. Co., 2806 Clearwater St., Los Angeles 39, Calif.—G  
 Leeds Eng'g. Co., 34-40 79 St., Jackson Heights 72, N.Y.—A,B,C,D,E,H,J,L,Q,S,T,U,X  
 Lenkurt Electric Co., 1105 County Rd., San Carlos, Calif.—X,Z  
 Leonard Electric Products Co., Inc., 67 34 St., Brooklyn 32, N.Y.—B,H,Q,S,W,AB  
 LePage Mfg. Co., 75-19 64 St., Glendale 27, N.Y.—A,B,D,H,I,L,P,Q,R,S,T,U  
 Maz-Electric Products, Inc., 14405 Crenshaw Ave., Gardiner, Calif.—X,Z,AD  
 Magnatron, Inc., 246 Schuyler Ave., Kearny, N.J.  
 Magnetic Amplifiers, Inc., 632 Tinton Ave., New York 55, N.Y.—C,O,S,X,Z,AD  
 Magnetic Metals Co., Hayes Ave. at 21 St., Camden 1, N.J.—M  
 Magnetics, Inc., Box 230-T, Butler, Pa.—X,Z  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, L.I., N.Y.—A, B, C, D, E, F, G, H, I, K, L, O, P, Q, R, S, T, U, V, W, X, Y, Z, AB  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—W,AB  
 Mattson-Cowley Corp., 1487 Lincoln Ave., Pasadena 3, Calif.—A,B,H,S,W,Z  
 Mav Eng'g. Co., 6055 Lankershim Blvd., N. Hollywood Blvd., N. Hollywood, Calif.—A,B,H,P,Q,S,T,U,V,W  
 MELPAR, INC., 452 Swann Ave., Alexandria, Va.  
 Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago 40, Ill.—A,B,C,H,L,P,Q,R,S,T,U,W,AC,AD,AF

MICO INSTRUMENT CO., 80 Trowbridge St., Cambridge 38, Mass.—Z  
 Microtran Co., Div. Crest Labs., Whitehall Bldg., Far Rockaway, N.Y.—A,B,N  
 Mid-West Coil & Transformer Co., 1642 N. Halsted St., Chicago 14, Ill.—A,B,C,D,G,H,I,J,K,L,N,P,Q,R,S,T,U,V,X,AE,AF  
 Midwest Electric Products Mankato, Minn.—F,K  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—W  
 Miller Co., J. W., 5917 S. Main St., Los Angeles 3, Calif.—V,W,AF  
 MILLIVAC INSTRUMENT CORP., 444 2 St., Schenectady, N.Y.—S,Z  
 Milwaukee Transformer Co., 5231 N. Hopkins St., Milwaukee 9, Wisc.—A,B,S,V  
 Moloney Electric Co., 5090 Birtcher Ave., St. Louis, Mo.—M  
 NATIONAL CO., INC., 61 Sherman St., Malden 48, Mass.—W  
 National Instrument Co., 23 E. 26 St., New York 10, N.Y.—O  
 NATIONAL MOLDITE CO., 1410 Chestnut Ave., Hillside 5, N.J.—M  
 Newcomb Audio Products Co., 6224 Lexington Ave., Hollywood 38, Calif.—B,E,R  
 N. Y. Transformer Co., Alpha, N.J.  
 Noethlfer Winding Labs., 9 Albermarle Ave., Trenton 3, N.J.—S  
 Nuclear Measurements, 2460 N. Arlington Ave., Indianapolis 18, Ind.—K,T  
 Ogden Coil & Transformer Co., 2124 W. Carroll Ave., Chicago 12, Ill.—A,B,C,D,H,J,L,P,Q,S,T,U,X,AD  
 Orthon Corp., 196 Albion Ave., Paterson, N.J.—A, B, C, F, G, H, K, L, P, Q, S, T, U, Z, AD  
 Osborne Transformer Corp., 948 E. Lafayette Ave., Detroit 7, Mich.—C,F,H,Q,S,U  
 Oxford Electric Corp., 3911 S. Michigan Ave., Chicago 15, Ill.—B,S  
 P C A Electronics Inc., 2180 Colo. Ave., Santa Monica, Calif.—H,Q,R,S,V  
 Peerless Electrical Products, Div. of Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—A,B,C,D,E,H,L,N,Q,S,T,U,V,Z  
 Pereny Equipment Co., 893 Chambers Rd., Columbus 12, Ohio—AD,AE  
 Permoflux Corp., 4900 W. Grand Ave., Chicago 39, Ill.—A,B,M,V,X  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—H  
 PHOTOCIRCUITS CORP., GLEN COVE, N.Y.—W  
 Polyphase Instrument Co., 705 Haverford Rd., Bryn Mawr, Pa.—V  
 Precise Measurements Co., 942 Kings Highway, Brooklyn 23, N.Y.  
 Pyroferic Corp., Bronx Blvd. & 216 St., New York 67, N.Y.—M  
 Q. L. C. Corp., 10 Aubrey St., Summit, N.J.—W  
 Quam-Nichols Co., 33 Pl. & Cottage Grove Ave., Chicago 16, Ill.—A  
 Radio Apparatus Corp., 55 N. New Jersey St., Indianapolis, Ind.—C,AD  
 RADIO CORP. OF AMERICA, R C A Tube Dept., 415 S. 5 St., Harrison, N.J.—A,B,H,L,P,Q,T,U,W  
 Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill.—W,Z  
 Radio Music Corp., 84 So. Water St., Port Chester, N.Y.—A,B,C,L,N,S,T,V  
 RAM Electronics, Irvington-on-Hudson, N.Y.—A,V,AF  
 Randall, Inc., Douglas, 102 High St., Westerly, R.I.—A,B,C,H,Q,S,T,U  
 RAYPAR, INC., 7800 W. Addison St., Chicago 34, Ill.—A,W,AF  
 RAYTHEON MFG. CO., Waltham 54, Mass.—A, B, D, F, G, H, K, M, O, P, Q, R, S, T, U, V, W, X, Y, Z, AB, AC, AD, AE, AF  
 Redman Electronics Corp., 92 Prospect St., Thompsonville, Conn.—V,W  
 Resdel Eng'r, 2351 Riverside Dr., Los Angeles 39, Calif.—W,AB  
 Research Electronics Labs., Roslyn, Pa.—V  
 R.K. Mfg. Co., P. O. Box 112, Marion, Ill.—A, B,C,D,E,F,G,H,K,L,N,P,Q,S,X,Y  
 Rola Co., 2530 Superior Ave., Cleveland 14, Ohio—B,H  
 Saratoga Industries, Ballston Ave., Saratoga Springs, N.Y.—A, B, C, F, G, H, J, K, L, P, Q, S, T, U, X, Z  
 Schaevitz Eng'r., Crescent Blvd. & Drexel Ave., Camden 1, N.J.—AC  
 Sealtron Co., 9701 Reading Rd., Cincinnati 15, Ohio—W  
 Schutter Mfg. Co., Carl W., 80 E. Montauk Highway, Lindenhurst, N.J.—O  
 SHURE BROS., 225 W. Huron St., Chicago 10, Ill.—N  
 Sickles Div., F. W., General Instrument Corp., P. O. Box 330, Chicopee, Mass.—W,X,Z,AF  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—E,K,V,W,AB  
 Smith Mfg. Co., Nathan R., 105 Pasadena Ave., S. Pasadena, Calif.—I,V  
 SNC Mfg. Co., P. O. Box 277, Oshkosh, Wisc.—B,C,D,H,L,P,Q,S,T,U,X  
 Sola Electric Co., 4633 W. 16 St., Chicago 50, Ill.—S,AD  
 Sonotone Corp., Elmsford, N.Y.—B,K  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—A,C,D,E,H,K,L,P,Q,R,X,Y,Z,AB  
 Spartan Radio Television, 2400 E. Ganson St., Jackson, Mich.—B, C, H, J, L, P, Q, S, T, U, V, W

Specialties, Inc., Skunks Misery Rd., Syosset, L.I., N.Y.—H,K,L,O,S,V,Y,Z,AB,AD  
 Square Root Mfg. Corp., 391 Saw Mill River Rd., Yonkers, N.Y.—A, B, C, D, F, H, K, L, Q, S, T, U, W, X, Z, AF  
 STACKPOLE CARBON Co., St. Marys, Pa.—M  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—X,Z  
 Standard Electrical Products Co., 2240 E. 3 St., Dayton 3, Ohio—B,C,G,H,J,K,L,Q,S,T,U, X,Z,AC,AD  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—A, C, D, E, F, G, H, K, L, N, P, Q, S, U, X, Z, AC, AD  
 Standard Electronic Research Corp., 2 East End Ave., New York 21, N.Y.—Z  
 STANDARD TRANSFORMER CORP., 3580 Elston Ave., Chicago 18, Ill.—A,B,C,D,F,G, H,J,K,L,N,P,Q,S,T,V,Z,AC,AD,AF  
 Stanwyck Winding Co., 137 Walsh Ave., Newburgh, N.Y.—S,T,U,V,W,Z  
 Sterling Transformer Corp., 297 N. 7 St., Brooklyn, N.Y.—A, B, C, D, E, H, K, L, P, Q, S, T, U, V, X  
 Stolle Eng'g., 3970 S. Grand Ave., Los Angeles 37, Calif.—AF  
 Stone City, P. O. Box 351, Bedford, Ind.—M  
 Strong Electric Corp., 87 City Park Ave., Toledo 2, Ohio—C,S  
 Summit Coil, 67 Union Pl., Summit, N.J.—W  
 Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—B,C  
 Superior Electric Co., 83 Laurel St., Bristol, Conn.—AC  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—N  
 Tech Labs., Inc., 120 Hillcrest Ave., Leonia, N.J.—K  
 Technicraft Labs., Inc., Thomaston-Waterbury Rd., Thomaston, Conn.—O  
 Technitrol Eng'g. Co., 2751 N. 4 St., Philadelphia 33, Pa.—R,V  
 TELECHROME, INC., 88 Merrick Rd., Amityville L.I., N.Y.—V  
 Telectro Industries Corp., 35-16 37 St., Long-Island City 1, N.Y.—B,C,P,S,T,U  
 Telescreen Corp., 36 Grove St., New Canaan, Conn.—X  
 Television Labs., Inc., 5045 W. Lake St., Chicago 44, Ill.—B,H,T,Z  
 Telex, Inc., 1633 Enstis St., St. Paul 1, Minn.—A,B,V,W  
 Tempel Mfg. Co., 1939 Bryn Mawr Ave., Chicago 26, Ill.—M  
 Thermador Electrical Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.—A,B,C,D,E,H, J,K,L,P,Q,R,S,T,U,V,AF  
 Thomas & Skinner, 1120 E. 23 St., Indianapolis 7, Ind.—M  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—H,K,R  
 Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—O  
 Todd-Tran Corp., 156 Gramatan Ave., Mount Vernon, N.Y.—A,B,F,H,I,Q,S,T  
 Torocoil, 1374 Mobile Ct., St. Louis 10, Mo.—Z  
 Torwico Electronics, Inc., 967 Frelinghuysen Ave., Newark 5, N.J.—Z  
 Transformer Engineers, 161 E. California St., Pasadena 1, Calif.—A,B,C,D,F,H,K,L,P, Q,S,U,V  
 Transformer Manufacturers, 850 W. Weed St., Chicago 22, Ill.—B,C,H,I,S,T  
 Transformer Technicians, 2608 N. Cicero Ave., Chicago 39, Ill.—A,B,C,D,E,F,H,J,K,L, P,Q,R,S,T,U,V,X,AE  
 Transformers, Inc., 532 North St., Endicott, N.Y.—K,S,V,Z  
 Transvision, Inc., 460 North Ave., New Rochelle, N.Y.—B,C,H,T,W  
 Trenton Transformer Corp., 822 E. State St., Trenton 4, N.J.—C, F, H, J, L, Q, S, T, X, AC, AD, AE, AF  
 Triad Transformer Corp., 4055 Redwood Ave., Venice, Calif.—A,B,C,D,H,J,K,L,P,Q,R, S,T,U,V,AF  
 Tri-Dex Co., P O Box 1207 Lindsay, Calif.—C,W,X,Y,Z,AB  
 Triwex Transformer Co., 3261 N. Milwaukee Ave., Chicago 18, Ill.  
 T V Products Corp., 907 E. 23 St., Paterson 3, N.J.—B,C,H,Q,S,T  
 Ultrasonic Eng'g. Co., P O Box 46, Maywood, Ill.—AB  
 Union Electric Products Co., 24 Edison Place, Newark 2, N.J.—B, C, G, H, I, L, Q, R, S, T, AD  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—A,B,C,D,E,F,G,H,I,J,K, L, N, P, Q, R, S, U, V, W, X, Y, Z, AB, AC, AD, AE, AF  
 United Pressed Products Co., 741 W. Harrison St., Chicago 7, Ill.—W  
 United Transformer Co., 150 Varick St., New York 13, N.Y.—A, B, C, D, E, F, G, H, K, L, N, P, Q, R, S, T, U, V, X, Y, Z, AB, AC, AD, AF  
 UNIVERSITY LOUDSPEAKERS, INC., 80 S. Kensico Ave., White Plains, N.Y.—B  
 U. S. Electronics Corp., 275 Warren St., Lyndhurst, N.J.—D,V,W,Z,AB  
 Utah Radio Products Co., 1123 E. Franklin St., Huntington, Ind.—B,C,H,L,T,V  
 Vanguard Electronics Co., 3384 Motor Ave., Los Angeles 34, Calif.—W  
 Varo Mfg. Co., 1801 Walnut St., Garland, Tex.—C,D,F,K,S,X  
 VECTOR, INC., 400 Main St., Waltham 54, Mass.—O

Wadsworth Mfg. Associates, 509 Balsam St., Liverpool, N.Y.—A,B,F,K,S,T,U  
 Waveline, Passaic Ave., Caldwell, N.J.—O  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—W  
 WESTINGHOUSE ELECTRIC CORP., Specialty Transformer Dept., Sharon, Pa.—M,S  
 Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.—F  
 Weymouth Instrument Co., 1440 Commercial St., East Weymouth 89, Mass.—O  
 Wheeler Insulated Wire Co., 150 E. Aurora St., Waterbury, Conn.—B,C,H,K,L,T,V  
 White Industries, Inc., 421 W. 54 St., New York 19, N.Y.—A,H,S,V,W  
 Wood Co., Ash M., 11938 E. Garvey Blvd., El Monte, Calif.—O,V

Brubaker Mfg. Co., 9151 Exposition Dr., Los Angeles 34, Calif.—W  
 Browning Labs., Inc., 750 Main St., Winchester, Mass.—H  
 Budelman Radio Corp., 375 Fairfield Ave., Stamford, Conn.—D, F, O, L, U, V, AA, AB, AC  
 Bunnell & Co., J. H., 81 Prospect St., Brooklyn 1, N.Y.—A,J,X,Y  
 Canoga Corp., 5955 Sepulveda Blvd., Van Nuys, Calif.—X,AB  
 CBS-Columbia Inc., 170 53 St., Brooklyn 32, N.Y.—E,J,T,V,X,AB  
 Century Electronics, 14806 Oxnard St., Van Nuys, Calif.—V  
 Century Geophysical Corp., 3406 W. Washington Blvd., Los Angeles 18, Calif.—AA  
 C.G.S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—E,F,G,U,Z  
 Collins Radio Co., 855 35 St., N.E., Cedar Rapids, Ia.—I,J,K,P  
 Commercial Radio Monitoring Co., P.O. Box 7037, Kansas City, Mo.—H  
 Communication Devices Co., 2331 12 Ave., New York 27, N.Y.—E, F, G, J, K, Q, T, V, X, AB  
 Communications Co., 300 Greco Ave., Coral Gables, Fla.—E,F,J,V,T,AC  
 Conn. Telephone & Electric Co., 70 Britannia St., Meriden, Conn.—H  
 Continental Electronics Mfg., Co., 4212 S. Buckner Blvd., Dallas 10, Tex.—K,Y,AC  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—AD  
 CROSBY LABS., Robbins Lane, Hicksville, N.Y.  
 Crown Eng'g., 3521 Commercial N.E., Albuquerque, N.M.—AA,AB  
 Cubic Corp., 2841 Canon St., San Diego 6, Calif.—U,AB  
 Dage Electronics Corp., 69 N. 2 St., Beech Grove, Inc.—AA  
 Daven Co., 191 Central, Newark 4, N.J.—AA  
 Dayton Aviation Radio & Equip. Corp., P.O. Box 167, Vandalia, Ohio—J,AC  
 Deltronic Co., 9010 Bellanca Ave., Los Angeles, Calif.—F  
 DeMornay-Bonardi, Inc., 3223 Burton Ave., Burbank, Calif.—U,W  
 DeWald Radio, United Scientific Lab. Inc., 35-15 37 Ave., Long Island City 1, N.Y.—C  
 Diamond Microwave Corp., 7 North Avenue, Wakefield, Mass.—U  
 Diamond Power Specialty Corp., P O Box 415, Lancaster, Ohio—AA  
 Dormitzer Electric & Mfg. Co., 5 Hadley St., Cambridge 40, Mass.—W  
 D & R, Ltd., 402 E. Gutierrez St., Santa Barbara, Calif.—AB,AC  
 DuMONT LABS., INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—M,N  
 DuMONT LABS INC., ALLEN B., 1000 Main Ave., Clifton, N.J.—U,V,W  
 DuMONT LABS. INC., ALLEN B., TV Transmitter Div., Clifton, N. J.—M,N  
 DuMONT LABS., INC., ALLEN B., 2 Main St., Passaic, N.J.—D,M,N,AB,AC  
 Edo Corp., College Point, N.Y.—Z  
 Eldico of N.Y., 44-31 Douglass Pkwy, Douglaston, L.I., N.Y.—A, E, F, I, J, T, V, Y, AA, AB, AC, AD  
 Electron-Radar Products, 1041 N. Pulaski Rd., Chicago 51, Ill.—U  
 Electro-Technics, Inc., 198 Albion Ave., Paterson, N.J.—AD  
 Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—E,Q,W,AB,AC  
 EJECTRO-VOICE, INC., Cecil & Carroll Sts., Buchanan, Mich.—I,V  
 Elm Laboratories, 18 S. Broadway, Dobbs Ferry, N.Y.—Q  
 El-Tronics, Inc., 5 & Noble Sts., Philadelphia 23, Pa.—E,T,AB  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—U,W  
 Empire Devices, Inc., 38-25 Bell Blvd., Bayside 61, N.Y.—U,AA  
 Erco Radio Labs., Stewart Ave., Garden City, N.Y.—P, Q, T, V, X, Y, AB, AC  
 Esney Mfg. Co., 528 E. 72 St., New York 21, N.Y.—C, D, E, F, G, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC  
 Federal Telecommunication Labs., Inc., 500 Washington Ave., Nutley, N.J.—M, N, U, V, AB, AD  
 FEDERAL TELEPHONE & RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—S,U,V,W, X,AB,AC  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—F,O  
 Fisher Research Lab., Inc., 1961 University Ave., Palo Alto, Calif.—Q,T  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—C,E,F,G,S,T,U, V,W,X,Y,Z,AA,AB,AC  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—T,V,AB,AC  
 Garod Radio Corp., 70 Washington St., Brooklyn 1, N.Y.—C  
 GATES RADIO CO., Quincy, Ill.—K,L,M,N,T, V,AB,AC,AD  
 General Communications, P O Box 169, Fort Atkinson, Wisc.—K,M  
 General Electrosonics, Inc., 32 W 22 St., New York 10, N.Y.—S,Z  
 GENERAL PRECISION LABS., INC., 63 Bedford Rd., Pleasantville, N.Y.—U  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—H  
 G & M Equipment Co., 7315 Varma Ave., N. Hollywood, Calif.—A, E, F, H, I, J, K, L, M, N, O, V, W, X

### 93—TRANSMITTERS

Code senders, automatic	A
Depth sounders	B
Radiosondes	C
Remote pickups	D
Transceivers, fixed	E
Transceivers, portable hand	F
Transceivers, portable lifeboat	G
Transmission monitoring equipment	H
Transmitters, amateur	I
Transmitters, aviation	J
Transmitters, broadcast AM	K
Transmitters, broadcast FM	L
Transmitters, broadcast UHF-TV	M
Transmitters, broadcast VHF-TV	N
Transmitters, citizens radio	O
Transmitters, code	P
Transmitters, direction finding	Q
Transmitters, facsimile	R
Transmitters, loran	S
Transmitters, marine	T
Transmitters, microwave	U
Transmitters, mobile	V
Transmitters, radar	W
Transmitters, radio range	X
Transmitters, radioteletype	Y
Transmitters, sonar	Z
Transmitters, telemetering	AA
Transmitters, UHF	AB
Transmitters, VHF	AC

Aeronautical Communications Equip., Inc., 3090 Douglas Rd., Miami 33, Fla.—H,J,AB, AC  
 Aeronautical Radio Mfg. Co., 155 1 St., Mineola, N.Y.—J,AC  
 Air Associates Inc., 511 Joyce St., Orange, N.J.—C,E,F,J,P,Q,V,X,Y,Z,AB,AC  
 Airborne Electronics Co., Metropolitan Airport, Van Nuys, Calif.—J,AC  
 Aircraft Armaments Inc., 4415 Reisterstown Rd., Baltimore 15, Md.—A,C,H,W  
 AIRCRAFT RADIO CORP., P.O. Box 150, Boonton, N.J.—F,G,J  
 AIRTRON, INC., 1109 W. Elizabeth Ave., Linden, N.J.—U  
 Allied Int'l Inc., 230 Park Ave., New York 17, N.Y.—E,F,V  
 Allied Research & Eng'g. Inc., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—U  
 American Electroneering Corp., 2040 Colo. Ave., Santa Monica, Calif.—Q,W,AC  
 American Machine & Foundry Co., 1085 Commonwealth Ave., Boston, Mass.—U,W,Z  
 Anglo Corp., 2037 W. Division St., Chicago 22, Ill.—A  
 AMPEX ELECTRIC CORP., Redwood City, Calif.—AA  
 Ansley Electronics, 85 Tremont St., Meriden, Conn.—C,S,Q,U,W,AB,AC  
 Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.—Q,T,V  
 Applied Science Corp., P.O. Box 44 Princeton, N.J.—H,AA  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—C,J,W,AA,AB,AC  
 Babcock Radio Eng'g. Inc., 7942 Woodley Ave., Van Nuys, Calif.—J  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—I,V,Y,AD  
 Basset, Inc., Rex, 1314 N. E. 17 Court, Fort Lauderdale, Fla.—E,T,Y  
 BENDIX AVIATION CORP., Pacific Div., 11600 Sherman Way, N. Hollywood, Calif.—B,U,W,AA  
 BENDIX RADIO DIV., Bendix Aviation Corp., Towson 4, Md.—J,V,W  
 Berger Communications, 109-01 72 Rd., Forest Hills, L.I., N.Y.—E,J,V  
 Boehme, Inc., H. O., 915 Broadway, New York 10, N.Y.—A,P  
 BOMAC LABS., INC., Salem Road, Beverly, Mass.—U  
 Breco Electronics Corp., 55 Vandam St., New York 13, N.Y.—A  
 Bristol Eng'g Corp., Lincoln & Pond Sts., Bristol, Pa.—K,L,U,W,AD

Gonset Co., 801 S. Main St., Burbank, Calif.—E,F,I,V,AB  
 Graybar Electric Co., Nat'l Headquarters, 420 Lexington Ave., New York 17, N.Y.—K,L,M,N  
 Gray Radio Co., 501 Forest Hill Blvd., W. Palm Beach, Fla.—T  
 G. W. Assoc., Box 2263 El Segundo, Calif.—U  
 Hallicrafters Co., 4401 W. 5 Ave., Chicago 24, Ill.—E,F,I,J  
 HAMMARLUND MFG. CO., 460 W 34 St., New York 1, N.Y.—AA  
 Harmon Electronics Co., 11431 Truman Rd., Independence, Mo.—V,AA  
 Hastings Instrument Co., Superhighway at Pine Ave., Hampton, Va.—V,X  
 Hogan Labs. Inc., 155 Perry St., New York 14, N.Y.—R  
 Hudson American Corp., 25 W 43 St., New York, N.Y.—T  
 Int'l. Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—H,F,AA  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—V  
 Jefferson, Ray, 40 E. Merrick Rd., Freeport, N.Y.—J  
 JOHNSON CO., E. F., Waseca, Minn.—I  
 Kaar Eng'g. Corp., 2995 Middlefield Rd., Palo Alto, Calif.—B,Q,T,V,AB,AC  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—O  
 Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—U  
 KOLLSMAN INSTRUMENT CORP., 80-08 45th Ave., Elmhurst 73, N.Y.—J,X  
 Korb Engr. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—W  
 Laboratory for Electronics, 75 Pitts St., Boston, Mass.—W  
 LaPointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—A,K,P  
 Lavoie Labs Inc., Morganville, N.J.—E,V,W,AB,AC  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—D, E, F, J, O, Q, T, V, X, AB, AC  
 Lettine Radio Mfg. Co., 62 Berkley St., Valley Stream, N.Y.—I,P,V  
 Lysco Mfg. Co., 1401 Clinton St., Hoboken, N.J.—F,I,T,V,AB,AC  
 Mackay Radio & Telegraph Co., 345 Hudson St., New York 14, N.Y.—Q,T,W  
 MAGNAVOX, Fort Wayne 4, Ind.—E,J,Q,W,X  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—D,F,O,Q,U,W  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—A,E,F,G,H,J,K,L,N,Q,W,X,AC  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—C  
 Mattson-Cowley, 1487 Lincoln Ave., Pasadena 3, Calif.—A,E,V,AA  
 Maxson Corp., W. L., 460 W. 34 St., New York 1, N.Y.—U,W,AD  
 MELPAR, INC., 452 Swann Ave., Alexandria, Va.—W,AA  
 Metrotype Corp., 525 W 76 St., Chicago 20, Ill.—AA  
 MICROWAVE ASSOCIATES INC., 22 Cummington St., Boston, Mass.—U,W  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—I  
 Mitchell Industries, Mineral Wells, Texas—J  
 Morrow Radio Mfr. Co., 2794 Market St., Salem, Ore.—D, E, F, G, H, I, J, O, P, T, V, AB, AC  
 Motorola Inc., Communications-Electronics Div., 4545 W. Augusta Blvd., Chicago, Ill.—E,F,I,O,U,V,AR,AC  
 MYCALEX CORP. OF AMERICA, 125 Clifton Blvd., Clifton, N.J.—AA  
 National Aeronautical Corp. (NARCO), 180 S. Main St., Ambler, Pa.—J,AC  
 National Electronics Labs., Inc., 1713 Kalamazoo Rd., N.W., Washington 9, D.C.—AC  
 Northeastern Eng'g. Corp., S. Bedford St., Manchester, N.H.—B,C  
 Northern Radio Co., 314 Bell St., Seattle 1, Wash.—E,H,I  
 NRK MFG. & ENG'G. CO., 4601 W. Addison St., Chicago 41, Ill.—U  
 Pacific Mercury TV Mfg. Corp., 5955 Van Nuys Blvd., Van Nuys, Calif.—F  
 Packard-Bell Co., 12333 W. Olympic Blvd., W. Los Angeles, Calif.—B  
 Parts Producing Corp., Manhattan Div., 1861 2 Ave., New York 28, N.Y.—V  
 Pearce-Simpson, Inc., 3023 Coral Way, Miami 34, Fla.—E,F,T  
 PHILCO CORP., Government & Industrial Div., 4700 Wissahickon Ave., Philadelphia 44, Penna.—S,U  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—I  
 Pioneer Electric & Research Corp., 743 Circle Ave., Forest Park, Ill.—P  
 Plastics & Electronics Co., Inc., 272 Northland Ave., Buffalo 8, N.Y.—F,O  
 Albert Pratt, 1939 N. 18 S., Milwaukee 5, Wis.—V  
 Premier Instrument Corp., 52 W. Houston St., New York 12, N.Y.—U  
 Press Wireless Mfg. Co., 155 W. Main St., Rockville, Conn.—P,R,U,W  
 PRODELIN, INC., 307 Bergen Ave., Kearny, N.J.—AD  
 Radio Apparatus Corp., 55 N. New Jersey St., Indianapolis, Ind.—H  
 RADIO CORP. OF AMERICA, RCA Victor Div. Eng'g. Products Div., Camden 2, N.J.—E,F,K,L,M,N,U,V,AB,AC,AD

# ELECTRONIC INDUSTRIES DIRECTORY

RADIO ENGINEERING LABS., 36-40 37 St., Long Island City 1, N.Y.—D,L,U,AC,AA,B  
 Radio Labs Inc., 1846 Westlake Ave. N. Seattle 9, Wash.—J,T  
 Radio Mfg. Engineers, Inc., 300 1 Ave., Peoria 6, Ill.  
 RADIO RECEPTOR CO., 84 N. 9 St., Brooklyn 11, N.Y.—J,X,AB,AC  
 Radio Specialty Mfg. Co., 2023 S.E. 6 Ave., Portland 14, Ore.—V  
 Raytheon TV & Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill.—E,U,W,AB,AC  
 Remco Mfg. Co., 545 N. LaSalle St., Chicago 10, Ill.—C  
 Remler Co., 2101 Bryant St., San Francisco 10 Calif.—G,J,X  
 Resdel Eng'r., 2351 Riverside Dr., Los Angeles 39, Calif.—W,X,Z,AA,AB  
 Reynolds Radio & Equip. Lab., H. B., 219 Stone St., Oneida, N.Y.—F,V  
 Rich Electronics, Inc., 212 N.W. 8 Ave., Miami 36, Fla.—T,AC  
 Rosen Eng'g. Products, Inc., Raymond, 32 & Walnut Sts., Philadelphia 4, Pa.—AA  
 Ryan Industries, Inc., 19159 John R St., Detroit 3, Mich.—W  
 Selectar Industries, Inc., 401 E. 138 St., New York 54, N.Y.—F  
 Servo Corp. of America, 2020 Jericho Turnpike, New Hyde Park, L.I., N.Y.—Q  
 Servo-Tek Products Co., 1086 Goffle Rd., Hawthorne, N.J.  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—U,AB,AC  
 Sightmaster Corp., 111 Cedar St., New Rochelle, N.Y.—O  
 Sonar Radio Corp., 3050 W. 21 St., Brooklyn 24, N.Y.—F, I, J, K, L, M, N, O, P, Q, T, V, Z,AB,AC  
 Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Houston, Texas—E,F  
 Spera Electronics Labs., 37-10 33 St., Long Island City, N.Y.—I,M,O,V,AR  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—C,AA,AB,AC  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—K,L,M,N,T,AB,AC,AD  
 Stelma, 389 Ludlow St., Stamford, Conn.—Y  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—W,Z,AB,AC  
 Television Co. of America, 1761 Lincoln Blvd., Santa Monica, Calif.—I  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—N,AA,AC,AD  
 Telemarine Communications Co., 3040 W. 21 St., Brooklyn 23, N.Y.—E,F,G,L,O,P,Q,T,U,V,X,Z,AB,AC  
 Telescreen, 36 Grove, New Canaan, Conn.—U,W  
 TEL-INSTRUMENT CO., 50 Paterson Ave., E. Rutherford, N.J.—N  
 Texas Instruments Inc., 6000 Lemmon Ave., Dallas, Texas—F  
 Times Facsimile Corp., 540 W. 58 St., New York 19, N.Y.—R  
 Torngren Co., C. W., 236 Pearl St., Somerville, Mass.—U  
 Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—D,I,J,K,P,Q,T,U,V,W,X,Y,AA,AB,AC  
 Ultradyne Eng'g. Labs., Inc., P. O. Box 8007, Albuquerque, N. Mex.—A,P  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—C,W,Z  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—E,F,G  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—U,AB  
 Video Corp. of America, 229 W. 28 St., New York 1, N.Y.—U,W  
 Videon Electronic Corp., 222 E. Ohio St., Indianapolis 4, Ind.—I,W  
 West Coast Electronics Co., 5873 W. Jefferson Blvd., Los Angeles 16, Calif.—V,AA,AC  
 Western Mfg. Co., 1400 W. 22 St., Kearney, Nebr.—E,F,I,Q,U,V,AB,AC  
 WESTINGHOUSE ELECTRIC CORP., 2519 Wilkens Ave., Baltimore 3, Md.—K,L,U  
 Westrex, 111 S Ave., New York 11, N.Y.—Y  
 Weymouth Instrument Co., 1440 Commercial St., E. Weymouth 89, Mass.—U  
 White Industries, Inc., 421 54 St., New York 19, N.Y.—J,U,AB,AC  
 White & Sons, Inc., Wilfrid O., 178 Atlantic Ave., Boston 10, Mass.—Z  
 Wickes Eng'r. & Const. Co., 12 St. & Ferry Ave., Camden, N.J.—Y  
 Wilcox Electric Co., 1400 Chestnut St., Kansas City 1, Mo.—J,V,X,Z,AB,AC  
 Willys-Overland Motors, Inc., Electronics Div., 6225 Benore Rd., Toledo, Ohio—A,M,W,AA,AB,AD

## 94—TRANSMITTER ACCESSORIES

Blowers .....	A
Control consoles .....	B
Couplers .....	C
Diplexers .....	D
Keyers .....	E
Keys .....	F
Power Supplies .....	G
Power Supplies, auxiliary .....	H

Aeme Electronics, 300 N. Lake Ave., Pasadena 4, Calif.—G  
 Aeronautical Communications Equip., Inc., 3090 Douglas Rd., Miami 33, Fla.—E  
 Air Associates Inc., 511 Joyce St., Orange, N.J.—G  
 AIRTRON, INC., 1109 W. Elizabeth Ave., Linden, N.J.—C,D  
 Allied Int'l Inc., 230 Park Ave., New York 17, N.Y.—G,H  
 Allied Research & Eng'g., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—C  
 American Electroneering Corp., 2040 Colo. Ave., Santa Monica, Calif.—B,G  
 American TV & Radio Co., 300 E. 4 St., St. Paul 1, Minn.—G,H  
 Anglo Corp., 2037 W. Division St., Chicago 22, Ill.—E  
 ANDREW CORP., 363 E. 75 St., Chicago 19, Ill.—D  
 Applied Electronics Co., 1246 Folsom St., San Francisco 3, Calif.—G  
 Arkay Co., 605 1 Ave. S.W., Rochester, Minn.—E  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—B,G  
 Barber Labs, Alfred W., 32-44 Francis Lewis Blvd., Flushing 58, N.Y.—E  
 Barker & Williamson, 237 Fairfield Ave., Upper Darby, Pa.—C,E,G  
 Boehme, Inc., H. O., 915 Broadway, New York 10, N.Y.—E  
 Breico Electronics Corp., 55 Vandam St., New York 13, N.Y.—E,F  
 Bristol Eng'g. Corp., Lincoln & Pond Sts., Bristol, Pa.—B,G  
 Bunnell & Co., J. H., 81 Prospect St., Brooklyn 1, N.Y.—E,F  
 CBS-Columbia Inc., 170 53 St., Brooklyn 32, N.Y.—G,H  
 C.G.S. Labs, Inc., 391 Ludlow St., Stamford, Conn.—D,E  
 Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—G  
 Codetypers Labs., 550 5 Ave., New York 19, N.Y.—E  
 Cornell-Dubilier Electric Corp., 333 Hamilton Blvd., South Plainfield, N.J.—G  
 Cubic Corp., 2841 Canon St., San Diego 6, Calif.—C,D  
 DuMONT LABS., INC., ALLEN B., TV Transmitter Div., 1500 Main Ave., Clifton, N.J.—D  
 DuMONT LABS., ALLEN B., 2 Main Ave., Passaic, N.J.—B,D,G,H  
 Eicor, Inc., 1501 W. Congress St., Chicago 7, Ill.—G  
 Eldico of N.Y., 44-31 Douglaston Pkwy., Douglaston, L.I., N.Y.—B,E,F,G,H  
 Electro Craft, Inc., 68 Jackson St., Stamford, Conn.—G  
 Electronic Heating Corp., 66 Needham St., Newton Highlands 61, Mass.—G  
 Electrotechnic Corp., 15601 Arrow Hwy., Azusa, Calif.—G,H  
 EL-Tronics, Inc., 5 & Noble Sts., Phila. 23, Pa.—G  
 Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo.—A  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas—B  
 Erico Radio Labs., Stewart Ave., Garden City, N.Y.—E  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—B,C,E,G,H  
 Feiler Eng'g. & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—E  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—B,G,H,Q  
 Furst Electronics, 3322 W. Lawrence Ave., Chicago 25, Ill.—G  
 Gaertner Radio Co., 3612 Maple Ave., Los Angeles 11, Calif.—G,H  
 GATES RADIO CO., 123 Hampshire St., Quincy, Ill.—B,C,D,G  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—A  
 GENERAL ELECTRIC CO., Electronics Park, Syracuse, N.Y.—G  
 General Hermetic Sealing Corp., 99 Hawthorne Ave., Valley Stream, Long Island, N.Y.—B,G  
 Inet, Inc., 8655 S. Main St., Los Angeles 3, Calif.—G  
 Int'l Research Associates, 2221 Warwick Ave., Santa Monica, Calif.—N  
 Jarvis Electronics Corp., 6058 Fullerton Ave., Chicago 39, Ill.—G,J  
 JOHNSON CO., E. F., Waseca, Minn.—F  
 Keppo Labs., 131-38 Sanford Ave., Flushing 55, N.Y.—G,H  
 Lear, Inc., 11916 W. Pico Blvd., Los Angeles 64, Calif.—G



McLean Eng'g. Labs., 260 Nassau St., Princeton, N.J.—A  
 Mackay Radio & Telegraph Co., 345 Hudson St., New York 14, N.Y.—G  
 Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N.Y.—G  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—G  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—D  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—G  
 Mattson-Cowley, 1487 Lincoln Ave., Pasadena 3, Calif.—E,G  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—G  
 Morrow Radio Mfg. Co., 2794 Market St., Salem, Ore.—G,H  
 NATIONAL CO., 61 Sherman St., Malden 48, Mass.—E  
 Neutronic Associates, 83-56 Victor Ave., Elmhurst 73, N.Y.—G  
 Northeastern Eng'g. Corp., So. Bedford St., Manchester, N.H.—E,G  
 Onan & Sons Inc., University Ave., W.E. at 25, Minneapolis 14, Minn.—G  
 Opad-Green Co., 71 Warren St., New York 7, N.Y.—G  
 Oster Mfg. Co., John, 1 Main St., Racine, Wisconsin—A  
 Pearce-Simpson, Inc., 3023 Coral Way, Miami 34, Fla.—G  
 Press Wireless Mfg. Co., 155 W. Main St. Rockville, Conn.—G  
 PRODELIN, INC., 307 Bergen Ave., Kearny, N.J.—D  
 RADIO CORP. OF AMERICA, RCA Victor Div., Camden 2, N.J.—B  
 Remler Co., 2101 Bryant St., San Francisco 10, Calif.—E  
 Resdel Eng'g., 2351 Riverside Dr., Los Angeles 39, Calif.—G  
 Rich Electronics, Inc., 212 N.W. 8 Ave., Miami 36, Fla.—G  
 Ripley Co., 1 Factory, Middletown, Conn.—A  
 Selectar Industries, 401 E. 138 St., New York 54, N.Y.—E,G  
 Servomechanisms, Inc., Post & Stewart Ave., Westbury, L.I., N.Y.—A  
 Sierra Electronic Corp., 1050 Brittan Ave., San Carlos, Calif.—C  
 Smith Meeker Eng'g. Co., 157 Chambers St., New York 7, N.Y.—B,G  
 Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.—G  
 Sparton Radio Television, 2400 E. Ganson St., Jackson, Mich.—G  
 Specialty Assembling Co., 79 Clifton Pl., Brooklyn 38, N.Y.—G  
 Spera Electronics Labs., 37-10 33 St., Long Island City, N.Y.—G,H  
 Stanat Tool & Machine Co., 47-28 37 St., Long Island City 1, N.Y.—A  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—B,D,G  
 Stone City, P.O. Box 351, Bedford, Ind.—C  
 TELECHROME, INC., 88 Merrick Rd., Amityville, L.I., N.Y.—H  
 Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—C  
 Transformer Technicians, 2608 N. Cicero Ave., Chicago 39, Ill.—G  
 Transmitter Equip. Mfg. Co., 345 Hudson St., New York 14, N.Y.—B,G  
 Ultradyne Eng'g. Labs. Inc., P. O. Box 8007, Albuquerque, N. Mex.—E  
 Ultrasonic Corp., 61 Rogers St., Cambridge 42, Mass.—B  
 Union Spring & Mfg. Co., 1057 Summit Ave., Jersey City 7, N.J.—G  
 Universal Electronics Co., 2012 S. Sepulveda Blvd., Los Angeles 25, Calif.—G  
 Vibroflex Co., 833 B'dway, New York, N.Y.—F  
 White Industries, 421 54 St., New York 19, N.Y.—E  
 Wickes Eng'g. & Construction Co., 12 St. & Ferry Ave. Camden 4, N.J.—G  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio—G

## 95—TUBES

**Tubes, ballast** . . . . . A  
**Tubes, battery charger** . . . . . B  
**Tubes, cathode-ray** . . . . . C  
**Tubes, electron multiplier** . . . . . D  
**Tubes, gas** . . . . . E  
**Tubes, geiger counter** . . . . . F  
**Tubes, ignitron** . . . . . G  
**Tubes, klystron** . . . . . H  
**Tubes, magnetron** . . . . . I  
**Tubes, miniature** . . . . . J  
**Tubes, noise** . . . . . K  
**Tubes, photo** . . . . . L  
**Tubes, pirani** . . . . . M  
**Tubes, projection** . . . . . N  
**Tubes, receiving** . . . . . O  
**Tubes, rectifying, industrial** . . . . . P  
**Tubes, rectifying, receiving** . . . . . Q  
**Tubes, rectifying, transmitting** . . . . . R  
**Tubes, scintillation** . . . . . S  
**Tubes, special purpose** . . . . . T  
**Tubes, subminiature** . . . . . U  
**Tubes, thyatron** . . . . . V  
**Tubes, transmitting-receiving** . . . . . W  
**Tubes, transmitting** . . . . . X  
**Tubes, traveling wave** . . . . . Y  
**Tubes, TV camera iconoscopes** . . . . . Z  
**Tubes, TV camera image orthicons** . . . . . AA  
**Tubes, voltage regulators** . . . . . AB  
**Tubes, X-Ray** . . . . . AC

Accurate Eng'g. Co., 2005 Blue Island Ave., Chicago 8, Ill.—B,E,P  
 Aerolux Light Corp., 653 11 Ave., New York 36, N.Y.—E,T,V,AB  
 Anglo Corp., 2037 W. Division St., Chicago 22, Ill.—T  
 Ampere Electronic Corp., 230 Duffy Ave., Hicksville, L.I., N.Y.—B,E,F,G,H,I,J,K,P,R,T,U,V,W,X,Y,AB,AC  
 AMPERITE CO., 561 Broadway, New York 12, New York—A  
 Anton Electronic Labs., 1226 Flushing Ave., Brooklyn 37, N.Y.—F,AB  
 Atlantic Electronics Corp., 89 Jefferson St., Passaic, N.J.—C  
 Atomic Instrument Co., 84 Mass. Ave., Cambridge 39, Mass.—F,S  
 Barry Electronics Corp., 136 Liberty St., New York 6, N.Y.—C, D, G, H, I, J, L, O, P, Q, R, T, U, V, X, AB  
 Bayside Watch Tool Co., 20-02 Utopia Parkway, Whitestone 57, L.I., N.Y.—J  
 BENDIX AVIATION CORP., Red Bank Div., Eatontown, N.J.—A, D, E, F, H, J, K, M, O, P, Q, T, U, V, AB  
 BENDIX AVIATION CORP., Cincinnati Div., 203 W. 3 St., Cincinnati 2, Ohio.—T  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—H,I,Y  
 BOMAC LABS., INC., Salem Road, Mass.—T,V  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—C,O,Q  
 BURROUGHS ADDING MACHINE CO., 511 N. Broad St., Philadelphia 23, Pa.—T,Z  
 Calvideo Tube Corp., 5232 W. 104 St., Los Angeles 45, Calif.—C  
 CBS-Hytron, Inc., 100 Endicott St., Danvers, Mass.—C,J,O,Q,T,X,AB  
 Central Sales & Mfg. Corp., 1 Richwood Place, Denville, N.J.—M,X  
 Chatham Electronics Corp., 475 Washington St., Newark 2, N.J.—A, E, J, O, P, R, T, U, V, W, AB  
 Claremont Labs., N.Y. Ave. & Main St., Westbury, L.I., N.Y.—C  
 Consolidated Vacuum Corp., 735 Ridge Rd., W., Rochester 3, N.Y.—I,J,M  
 Continental Electric Co., 715 Hamilton St., Geneva, Ill.—C,L,Q,V  
 Cyclotron Specialties Co., Moraga, Calif.—F  
 Diatron Co., 3327 Dixie Dr., Houston 21, Texas.—E,F  
 DuMONT LABS., INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—C,D,E,V  
 DuMONT LABS., INC., ALLEN B., 2 Main Ave., Passaic, N.J.—C,F,L  
 ECLIPSE-PIONEER DIV., Bendix Aviation, Teterboro, N.J.—T  
 Edgerton, Germeshausen & Grier, 160 Brookline Ave., Boston 15, Mass.—E,T,V  
 Egan Lab., 107-56 113 St., Richmond Hill 19, N.Y.—F  
 EITEL-McCULLOUGH, INC., 798 San Mateo Ave., San Bruno, Calif.—H,X  
 Elco Corp., 190 W. Glenwood Ave., Philadelphia 40, Pa.—J,U  
 Electronic Beam Corp., 923 Old Nepperhan Ave., Yonkers 3, N.Y.—C  
 Electronic Products Co., 111 E. 3 St., Mount Vernon, N.Y.—E,F,AB  
 Electronic Products Co., 4755 Telegraph Rd., Los Angeles 22, Calif.—C,F,R,T  
 Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18, Pa.—C,T

Electron-Radar Products, Chicago 51, Ill.—K,L  
 Electrons, Inc., 127 Sussex Ave., Newark 4, N.J.—B,E,M,P,V  
 Equipment & Service Co., 6815 Oriole Dr., Dallas 9, Texas.—D, F, H, I, L, Q, P, R, S  
 Eureka TV & Tube Corp., 69 5 Ave., Hawthorne, N.J.—C  
 FEDERAL TELEPHONE RADIO CORP., 100 Kingsland Rd., Clifton, N.J.—C,I,P,Q,R,T,U,X  
 Freeland Products' Co., 700 Dryades St., New Orleans 12, La.—R,X  
 GENERAL ELECTRIC CO., Apparatus Div., 1 River Rd., Schenectady 5, N.Y.—B  
 GENERAL ELECTRIC CO., Tube Dept., 1 River Rd., Schenectady 5, N.Y.—A, B, C, D, E, F, G, H, I, J, L, M, N, O, P, Q, R, T, U, V, W, X, Y, AB  
 GENERAL ELECTRONICS, Div. Arcturus Electronics, Inc., 101 Hazel St., Paterson, N.J.—C, E, O, P, Q, R, T, V, X  
 GENERAL PRECISION LAB., INC., 63 Bedford Rd., Pleasantville, N.Y.—AA  
 General Vacuum Tube Corp., 45 Elm St., Ardsley, N.Y.—C  
 Georator Corp., Manassas, Va.—F  
 Haydu Bros., Box 1226, Plainfield, N.J.—C,T,Q,X  
 Huggins Labs., 700 Hamilton Ave., Menlo Park, Calif.—T,Y  
 INT'L RECTIFIER CORP., 1521 E. Grand Ave., El Segundo, Calif.—O,T  
 JFD Mfg. Co., 6101 16 Ave., Brooklyn 4, N.Y.—A  
 Kip Electronics Corp., 155 Waverly Pl., New York 14, N.Y.—T,U,V  
 Lectro Max, Inc., 15 S. 1st St., Geneva, Ill.—L  
 Lewis & Kaufman Ltd., 17320 El Rancho Ave., Los Gatos, Calif.—M,P,R,T,X  
 Linde Air Products Co., Div. Union Carbide & Carbon Co., 30 E 42nd St., New York 17, N.Y.—X  
 Litton Industries 1025 Brittan Ave., San Carlos, Calif.—I  
 MACHLETT LABS., INC., 1063 Hope St., Springdale, Conn.—P,R,T,V,X,AC  
 Mackay Inc., A. D., 198 Broadway, New York 38, N.Y.—T  
 Marconi Instruments Ltd., 23 Beaver St., New York 4, N.Y.—F,H,I,T  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—I, N, O, P, Q, R, V, W, X, AA  
 Mark Electronics Inc., 86 Shipman St., Newark 2, N.J.—B,E,P  
 Martin & Co., H. S., 1916 Greenleaf St., Evanston, Ill.—C  
 Matchless Electric Co., 1700 Washington Blvd., Chicago 12, Ill.—A  
 Menlo Research Lab., P.O. Box 522, Menlo Park, Calif.—E,T  
 MICROWAVE ASSOCIATES, 22 Cummington St., Boston 15, Mass.—E,H,I,T  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—C,F,D,H,M,N,P,T,Y,AB,AC  
 Naer Corp., 11777 Santa Monica Blvd., W. Los Angeles 25, Calif.—C,T,V,Z,AA  
 National Electronics, Inc., 628 North St., Geneva, Ill.—E,G,P,R,T,V  
 National Union Radio Corp., Jacksonville Rd., Hatboro, Pa.—A, C, E, J, M, O, P, Q, R, T, U, W, X, AB  
 National Video Corp., 4300 W. 47 St., Chicago 32, Ill.—C  
 Nuclear Research & Devel. Co., 6425 Etzel Ave., St. Louis 14, Mo.—S  
 Nucleonic Co. of America, 497 Union St., Brooklyn 31, N.Y.—F,S  
 Orsyd Co., 6602 Walton Ave., Detroit 10, Mich.—C  
 Penta Labs., Inc., 216 N. Milpas St., Santa Barbara, Calif.—R,T,V,X,Y  
 Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.—L  
 Pioneer Electronics Corp., 2232 Broadway, Santa Monica, Calif.—A, C, E, J, M, U, V, Y, Z, AA, AB  
 Precision Products, 719 7 St., N.W., Washington, D.C.—L  
 Radiation Counter Labs., 5122 W. Grove St., Skokie, Ill.—F  
 RADIO CORP. OF AMERICA, RCA TUBE Dept., 415 S 5 St., Harrison, N.J.—C, D, E, G, I, J, L, M, N, O, P, Q, R, S, T, U, V, W, X, Z, AA, AB  
 RADIO RECEPTOR CO., 251 W. 19 St., New York 11, N.Y.—T  
 Radio Research Labs., 172 Front St., Marietta, Ohio.—AC  
 Rauland Corp., 4245 N. Knox Ave., Chicago 41, Ill.—C,E,N,T,V  
 RAYTHEON MFG. CO., Receiving Tube Div., 55 Chapel St., Newton 58, Mass.—E,F,J,O,P,Q, T, U, AB  
 RAYTHEON MFG. CO., Waltham 54, Mass.—C,H,I,N,P,R,T,X  
 Sanders Associates, 137 Canal St., Nashua, N.H.—I,T  
 Sheldon Electric Co., 68 Coit St., Irvington 11, N.J.—C,O  
 Sonotone Corp., Elmsford, N.Y.—O,T,U  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—X  
 STATE LABS., INC., 649 Broadway, New York 12, N.Y.—A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,AA,AB,AC  
 SYLVANIA ELECTRIC Products 1740 Broadway, New York 19, N.Y.—C, H, I, J, M, O, T, U, V, W

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**TELE-TECH**  
 & ELECTRONIC INDUSTRIES

# ELECTRONIC INDUSTRIES DIRECTORY

Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—V,W  
 Taylor Tubes, Inc., 2312 Wabansia Ave., Chicago 47, Ill.—E,P,R,T,V,X  
 Television Specialty Co., 350 W. 31 St., New York 1, N.Y.—AB  
 Tel-O-Tube Corp. of America, 180 Van Riper Ave., E. Paterson, N.J.—C  
 Thomas Electronic, Inc., 118 9 St., Passaic, N.J.—C  
 Thompson Clock Co., H. C., 38 Federal St., Bristol, Conn.—B,J,L,O,P,Q,R,U  
 TUNG-SOL Electric Inc., 95 8 Ave., Newark 4, N.J.—A, C, D, J, O, Q, T, U, W  
 United Electronics Co., 42 Spring St., Newark 4, N.J.—E,P,R,V,X  
 United Specialties Co., 9705 Cottage Grove Ave., Chicago 28, Ill.—C  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—C, E, H, M, P, R, T, V, Y  
 Varian Associates, 990 Varian St., San Carlos, Calif.—H  
 VICTOREEN INSTRUMENT CO., 3800 Perkins Ave., Cleveland 14, Ohio.—A,F,J,T,U, AB  
 WATERMAN PRODUCTS CO., 2445 Emerald St., Philadelphia 25, Pa.—C  
 Welch Electric Co., 1221 Wade St., Cincinnati 14, Ohio.—D,L  
 Western Electronic Enterprises, 3348 W. Compton Blvd., Gardena, Calif.—B,L,V  
 Western Radiation Lab., 1107 W. 24 St., Los Angeles 7, Calif.—F  
 WESTINGHOUSE ELECTRIC CORP., Electronic Tube Div., Box 284, Elmira, N.Y.—C, G, H, I, J, L, N, O, P, Q, R, T, V, W, X, AB  
 Wood Counter Lab., N., 5491 Blackstone Ave., Chicago 15, Ill.—S

## 96—TUBE PARTS

Adapters	A
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Anodes, metal	C
Bases	D
Base pins	E
Bulbs	F
Caps	G
Cathode ray, deflection plates	H
Cathode ray, electrodes	I
Cathode ray, electron guns	J
Cathode ray, phosphors	K
Cathode ray, side contacts	L
Cathode ray, sleeves	M
Cathodes	N
Cavities	O
Fluorescent materials	P
Fused quartz parts	Q
Getters	R
Grids	S
Ion Traps	T
Meters	U
Mica parts	V
Picture tube masks	W
Rare gases	X
Stamped parts	Y
Supports	Z
Tube repairing	AA
Tube seal leads	AB
Water jackets	AC
Wire parts	AD

Acheson Colloids Co., 1950 Washington Ave., Port Huron, Mich.—B,K  
 Adel Div., General Metals Corp., 10777 Van Owen St., Burbank, Calif.—Y,Z  
 Aerolite Electronics Corp., 507 26 St., Union City, N.J.—L,Y,AD  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass.—A,D,G,N  
 Allied Research & Eng'g. Inc., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—C  
 All Star Products, Inc., Defiance, Ohio.—T  
 American Laubscher Corp., 333 W. 52 St., New York 19, N.Y.—E  
 American Lava Corp., Chattanooga 5, Tenn.—D,Z  
 American Wood Working Co., 1682 N. Lowell Ave., Chicago 39, Ill.  
 Anchor Industrial Co., 36-36 36 St., Long Island City 6, N.Y.—M,Z  
 ART WIRE & STAMPING CO., 227 High St., Newark 2, N.J.—C,E,R,S,Y,Z,AD  
 Asheville Schoonmaker Mica Co., Box 318, Newport News, Va.—V  
 Baer Co., N.S., 1 Montgomery St., Hillside 5, N.J.—D,Y  
 Bram Chemical Co., 820 65 St., Philadelphia 26, Pa.—C,N,P  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—T,W  
 Brunswick Div., Radio & TV, Inc., 119 W. 57 St., New York 19, N.Y.—M,N  
 Celomat Corp., 521 W. 23 St., New York, N.Y.—W  
 CENTRALAB DIV., GLOBE-UNION, INC., 900 E. Keefe Ave., Milwaukee 1, Wisc.—D

Ceramic Heater Cathode Resistor Co., 20 1 St., Keyport, N.J.—N  
 C.G.S. Labs., Inc., 391 Ludlow St., Stamford, Conn.—O  
 CINCH MFG. CORP., 1026 S. Homan Ave., Chicago 24, Ill.—G  
 Colorvision Plastics, Inc., 247 Atlantic Ave., Boston 10, Mass.—W  
 Communication Measurements Lab., Inc., 350 Leland Ave., Plainfield, N.J.—A  
 CONSTANTIN & CO., L. L., Lodi, N.J.—D,AB  
 Continental-Diamond Fibre Co., Newark, Del.—V,Y  
 Corning Glass Works, P. O. Box 544, Corning, N.Y.—F  
 Croname, Inc., 3701 Ravenswood Ave., Chicago 13, Ill.—W  
 Driver Co., Wilbur B., 150 Riverside Ave., Newark 4, N.J.—C,AD  
 DUMONT LABORATORIES, INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—H, I, J,K,L,M  
 DuPont de Nemours & Co., E. I., Polychemicals Dept., Wilmington 98, Del.—K  
 Electronic Mechanics, Inc., 101 Clifton Blvd., Clifton, N.J.—D  
 Electronic Parts Mfg. Co., 508 25 St., Union City, N.J.—I,N,R,S,AB,AD  
 ERCA Tool Die & Stamping Co., 19 Ash St., Brooklyn 22, N.Y.—D,J,S,V,Y  
 Fansteel Metallurgical Corp., 2200 Sheridan Rd., N. Chicago, Ill.—C,N,AB  
 General Electronics, Inc., 32 W. 22 St., New York 10, N.Y.—A  
 Haydu Bros., Box 1226, Plainfield, N.J.—J,S,Y, Z,AA,AD  
 HEPPNER MFG. CO., 60 E. 42 St., New York 17, N.Y.—T  
 Hermaseal Co., 1101 Lafayette St., Elkhart, Ind.—AB  
 HERMETIC SEAL PRODUCTS CO., 33 S. 6 St., Newark 7, N.J.—AB  
 Ippolito & Co., James, 401 Concord Ave., Bronx 54, N.Y.—Z  
 Isolantite Mfg. Corp., Warren Ave., Stirling, N.J.—D  
 Javex, Box 646, Redlands, Calif.—E  
 Johnson & Hoffman, 31 E 2 St., Mineola, L.I., N.Y.—C,H,I,J,L,S,V,Y,Z  
 KAHLE ENG'G CO., 1313 7 St., N. Bergen, N.J.—Y,Z  
 Kemet Co., P. O. Box 6087, Cleveland 1, Ohio—R  
 Keystone Watch Case Div., Riverside Metal Co., 1 Pavilion Ave., Riverside, N.J.—Y  
 Kimble Glass Co., P.O. Box 1035, Toledo 1, Ohio—F  
 King Labs, Inc., 127 Solar St., Syracuse 4, N.Y.—R,Y,AD  
 Kirchberger & Co., M., 1425 37 St., Brooklyn 18, N.Y.—D,G  
 Kulite Tungsten Co., 723 Sip St., Union City, N.J.—AB,AD  
 Lancaster Lens Co., 220 W. Main St., Lancaster, Ohio—F  
 Lapp Insulator Co., Le Roy, N.Y.—Z,AC  
 Linde Air Products Co., Div. Union Carbon & Carbide, 30 E. 42 St., New York 17, N.Y.—X  
 Litton Engineering Laboratories, 1049 Britton Ave., San Carlos, Calif.—AB  
 Machlett Labs., Inc., 1063 Hope St., Springfield, Conn.—Z,AB,AC  
 Mackay, Inc., A.D., 198 Broadway, New York 38, N.Y.—K,P,R,X  
 MacKenzie Products Co., 141 Brewery St., New Haven, Conn.—O  
 Malco Tool & Mfg. Co., 4025 W. Lake St., Chicago 24, Ill.—Y  
 Metal Hydrides, Inc., Congress St., Beverly, Mass.—R  
 Mica Fabricating Co., 53 Central Ave., Rochelle Park, N.J.—V  
 Mica Insulator Co., 797 Broadway, Schenectady, N.Y.—V,Z  
 Minerals & Insulation Co., 55 Central Ave., Rochelle Park, N.J.—Q,V  
 Molding Corp. of America, 40 Church St., Pawtucket, R.I.  
 Multi-Tron Lab., 4624 Washington Blvd., Chicago 44, Ill.—H,I,J,N,Y,AA,AD  
 Newark Radio Labs., P. O. Box 33, Eastham, Mass.—A,D,H,I,J,K,L,M,N,S,Y,AD  
 Owens-Illinois Glass Co., Madison & St. Clair Sts., Toledo 1, Ohio—D  
 Pix Mfg. Co., 22 Bedford St., Newark 3, N.J.—E,Y,AB,AD  
 Precision Plastic Products, 225 N. Racine Ave., Chicago 7, Ill.—G,W  
 RADIO CORP. OF AMERICA, RCA Tube Dept., 415 S. 5 St., Harrison, N.J.—C,D,E,F, H,I,J,K,L,M,N,O,P,R,S,Y,Z,AB,AC,AD  
 Reliable Spring & Wire Forms Co., 3167 Fulton Rd., Cleveland 9, Ohio.—AD  
 Rigidized Metals Corp., 658 Ohio St., Buffalo 3, N. Y.—S  
 Rogers Corp., Goodyear, Conn.—D

Sonotone Corp., Elmsford, N. Y.—N,J  
 STACKPOLE CARBON CO., St. Marys, Pa.—B  
 Standard Metals Corp., 262 Broad St., North Attleboro, Mass.—C,N  
 Staver Co., 41-51 N. Saxon Ave., Bay Shore, L. I., N. Y.—C,Y  
 Stone City, P.O. Box 351, Bedford, Ind.—D,E,R,Y,AD  
 Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.—Y  
 Superior Eng'g., 2500 Germantown Ave., Norristown, Pa.—N  
 Superior Eng'g., 2500 Germantown Ave., Norristown, Pa.—C,M,N  
 Swiss Jewel Co., Lafayette Bldg., Philadelphia 6, Pa.—E  
 SYLVANIA ELECTRIC PRODUCTS, 1740 Broadway, New York 19, N.Y.—C,D,E,G,H, I,J,K,L,M,N,P,R,S,V,Y,AD  
 Sycor Products Co., 26 Irving Court, Malden 48, Mass.—Q  
 Thomas Electronics, Inc., 118 9 St., Passaic, N. J.—J  
 THOR CERAMICS, INC., 225 Belleville Ave., Bloomfield, N. J.—D  
 United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.—F  
 U.S. Gasket Co., 602 N. 10 St., Camden 1, N. J.—D,Z,AC  
 U.S. Radium Corp., 535 Pearl St., New York 7, N. Y.—K,P  
 Vacuum Metals Corp., Sub. of National Research Corp., 70 Memorial Drive, Cambridge 42, Mass.—R  
 Vacuum Tube Products, 506 S. Cleveland St., Oceanside, Calif.—AA  
 Van Cleef Bros., 7800 S. Woodlawn Ave., Chicago 19, Ill.—B  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—O  
 Vidair Electronics Mfg. Co., 576 W. Merrick Rd., Lynbrook, L. I., N. Y.—AA  
 Volkert Metal Stampings, 22234 96 Ave., Queens Village 9, L. I., N. Y.—L,S,T,V,Y,AD  
 Wade Electric Products Co., 211 Jacob, Sturgis, Mich.—Y  
 Wadsworth Mfg. Assoc., 509 Balsam St., Liverpool, N. Y.—N  
 Waldom Electronics, 911 N. Larrabee St., Chicago 10, Ill.—W  
 Whitehead Stamping Co., 1661 W. Lafayette Blvd., Detroit 16, Mich.—Y  
 Woodall Industries, 7569 E McNichols Rd., Detroit 34, Mich.—W

## 97—TUNERS

Tuners, AM	A
Tuners, AM-FM	B
Tuners, FM	C
Tuners, Klystron	D
Tuners, Microwave	E
Tuners, Permeability	F
Tuners, Television	G
Tuners, UHF	H

Airtronic Devel. Corp., 20 W 22 St., New York 10, N.Y.—A  
 All Star Products Co., Defiance, Ohio—G,H  
 Altec Lansing Corp., 9356 Santa Monica Blvd., Beverly Hills, Calif.—B  
 Anchor Radio Corp., 2215 S. St. Louis Ave., Chicago 23, Ill.—G,H  
 Approved Electronic Instrument Corp., 928 Broadway, New York 10, N.Y.—A,B,H  
 A.R.F. Products, Inc., 7627 Lake St., River Forest, Ill.—E  
 Atlas Metal Stamping Co., Castor & Kensington Aves., Philadelphia 24, Pa.—C,E,H  
 Automatic Mfg. Corp., 65 Gouverneur St., Newark 4, N.J.—G  
 BOGART MFG. CORP., 315 Seigel St., Brooklyn 6, N.Y.—D,E  
 Boren Co., David, 29 9 Ave., New York 14, N.Y.—A,B,C  
 Browning Labs., Inc., 750 Main St., Winchester, Mass.—B,C  
 Calbest Eng'g & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—A,B,C,G  
 Carad Corp., 93 Leland Ave., San Francisco 28, Calif.—F  
 C.G.S. Labs., 391 Ludlow, Stamford, Conn.—F  
 Conrac, Inc., 19217 E. Foothill Blvd., Glendora, Calif.—B  
 Continental Electronics Mfg. Co., 4212 S. Buckner Blvd., Dallas 10, Texas—A  
 Coronet Radio & TV Corp., 1451 E. 27 St., Brooklyn 10, N.Y.—H  
 Crown Eng'g., 3821 Commercial N.E., Albuquerque, N.M.—H  
 Delco Radio Div., General Motors Corp., Kokomo, Ind.—C,F  
 DeMornay-Bonardi, Inc., 3223 Burton Ave., Burbank, Calif.—E  
 Dubrow Devel. Co., 235 Penn St., Burlington, N.J.—A,B,C,G,H  
 DUMONT LABS., INC., ALLEN B., 750 Bloomfield Ave., Clifton, N.J.—H  
 DX RADIO PRODUCTS, 2300 W. Armitage Ave., Chicago 47, Ill.—G,H  
 Electro Assemblies, Inc., 2985 W. Belmont Ave., Chicago 18, Ill.—A,F  
 ELECTRO-VOICE, INC., Cecil & Carroll Sts., Buchanan, Mich.—B,H  
 El-Rad Mfg., 2800 W. Cullon, Chicago, Ill.—G

Emerson Electric Mfg. Co., 811 Florissant Ave., St. Louis 21, Mo.—E  
 Espey Mfg. Co., 528 E. 72 St., New York 21, N.Y.—A,B,C,D,E,F,G,H  
 Feiler Eng'g & Mfg. Co., 8026 N. Monticello Ave., Skokie, Ill.—G  
 Fisher Radio Corp., 45-41 Van Dam St., Long Island City 1, N.Y.—B  
 Forbes & Wagner, 339 Central Ave., Silver Creek, N.Y.—F  
 Freed Electronics & Controls Corp., 200 Hudson St., New York 13, N.Y.—A,B,C,D,E,G,H  
 Garod Radio Co., 70 Washington St., Brooklyn 1, N.Y.—A,B  
 GENERAL ELECTRIC CO., Radio-TV Dept., Electronics Park, Syracuse, N.Y.—H  
 General Instrument Corp., 829 Newark Ave., Elizabeth 2, N.J.—C,E,G,H  
 Granco Products Inc., 36-17 20 Ave., Long Island City 5, N.Y.—G,H  
 Gries Reproducer Corp., 780 E. 133 St., New York 54, N.Y.  
 G. W. Associates, Box 2263, El Segundo, Cal.—D,E  
 Grigsby-Allison Co., 407 N. Salem Ave., Arlington Heights, Ill.—A,B,G,H  
 Interelectronics Corp., 2432 Grand Concourse, New York 58, N.Y.—B  
 Johnson Labs. Div., Aladdin Industries, Wil-lard Rd., Norwalk, Conn.—G,H  
 Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—E  
 Kingston Products Corp., 1412 N. Webster St., Kokomo, Ind.—A,E,G,H  
 Lab. for Electronics, Inc., 75 Pitts St., Boston, Mass.—E  
 Lavoie Labs. Inc., Morganville, N.J.  
 Leonard Electric Products Co., 67 34 St., Brooklyn 32, N.Y.—G,H  
 Lerner Instrument & Electronics, GPO Box 620, Brooklyn 1, N.Y.  
 Lytle Engineering & Mfg. Co., 4721 N. Kedzie Ave., Chicago 25, Ill.—C,G  
 McLaughlin, J. Box 529, La Jolla, Calif.—A  
 Magnavox Co., Fort Wayne 4, Ind.—G  
 MALLORY & CO., P. R., 3029 E. Washington St., Indianapolis 6, Ind.—B,C,G,H  
 Marine View Electronics, 744 E. 138 St., New York 54, N.Y.—B  
 Miller Co., J. W., 5917 S. Main St., Los Angeles 3, Calif.—A  
 Newcomb Audio Products Co., 6824 Lexington Ave., Hollywood 38, Calif.—A  
 Oak Mfg. Co., 1260 Clybourn Ave., Chicago 10, Ill.—G, H  
 Parts Producing Corp., Manhattan Div., 1861 2 Ave., New York 28, N.Y.—E  
 PHILCO CORP., Gov't & Industrial Div., 4700 Wissahickon Ave., Philadelphia 44, Pa.—D  
 Pilot Radio Corp., 37-06 36 St., Long Island City 1, N.Y.—B,G,H  
 Precision Electronics, 7518 Melrose Ave., Los Angeles 46, Calif.—A,B,C  
 Radio Condenser Co., Davis & Copewood Sts., Camden 3, N.J.—A,B,C,F,G,H  
 RADIO ENG'G LABS., INC., 36-40 37 St., Long Island City 1, N.Y.—C  
 Radio Industries, Inc., 5225 N. Ravenswood Ave., Chicago 40, Ill.—C,F  
 Radio Receptor Co., 84 N. 9 St., Brooklyn 11, N.Y.—G,H  
 Radio & TV Inc., Brunswick Div., 119 W. 57 St., New York 19, N.Y.—B,C,G,H  
 Rex Electronics Corp., 1351 E. De Loss St., Indianapolis, Ind.—H  
 Sargent-Rayment Co., 1401 Middle Harbor Rd., Oakland 20, Calif.—A,B  
 Schutter Mfg. Co., Carl W., 80 E. Montauk Highway, Lindenhurst, N.Y.—E  
 Sickles Div., F.W., General Insurance Corp., P.O. Box 330, Chicopee, Mass.—A,B,C,F,G,H  
 Specialty Assembling Co., 79 Clifton Pl., Brooklyn 38, N.Y.—E  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—A,B,F,G,H  
 Stromberg-Carlson Co., Rochester 3, N.Y.—B,C  
 Superex Electronics Corp., 23 Atherton St., Yonkers, N.Y.—B  
 TARZIAN, INC., SARKES, 539 S. Walnut St., Bloomington, Ind.—C,G,H  
 Technicraft Labs., Thomaston-Waterbury Rd., Thomaston, Conn.—E  
 Telex, Inc., 1633 Eustic St., St. Paul 1, Minn.—A,B,C  
 VECTRON, INC., 400 Main St., Waltham 54, Mass.—D,E  
 Videon Electronic Corp., 222 F. Ohio St., Indianapolis 4, Ind.—H  
 Waveline, Inc., Passaic Ave., Caldwell, N.J.—E  
 Weymouth Instrument Co., 1440 Commercial St., E. Weymouth 39, Mass.—E

ANDREW CORP., 363 E. 75, Chicago, Ill.—D  
 Atlas Metal Stamping Co., Castor & Kensington Aves., Philadelphia 24, Pa.—A,B,C  
 Audio Products Corp., 2265 Westwood Blvd., Los Angeles 64, Calif.—D  
 Barton Electronics, Inc., 955 Asylum Ave., Hartford 5, Conn.—D  
 Bayside Watch Tool Co., 20-02 Utopia Park-way, Whitestone 57, N.Y.C.—A,B  
 Bead Chain Mfg. Co., 88 Mountain Grove St., Bridgeport 5, Conn.—A  
 BORG EQUIP. DIV., BORG CORP., GEORGE W., 120 S. Main St., Janesville, Wis.—A  
 Bowmar Instrument Corp., Smith Municipal Airport, Fort Wayne, Ind.—A,C  
 Calbest Eng'g & Electronics Co., 828 N. Highland Ave., Hollywood 38, Calif.—D  
 CENTRALAB DIV., Globe-Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis.—E  
 Corning Glass Works, P. O. Box 544, Corning, N.Y.—E,F  
 Delco Radio Div., General Motors Corp., Kokomo, Ind.—B  
 Dietz Design & Mfg. Co., Grandview, Mo.—F  
 Electrical Communications, 765 Clementina St., San Francisco 3, Calif.—B,D  
 Electro Assemblies, Inc., 2935 W. Belmont Ave., Chicago 18, Ill.—F  
 Erie Resistor, 644 W. 12 St., Erie 6, Pa.—E  
 Erwood Inc., 1770 W. Berteau Ave., Chicago 13, Ill.—A  
 HI-Q Div., Aerovox Corp., Olean, N.Y.—E  
 General Instrument Corp., 829 Newark Ave., Elizabeth 2, N.J.—E  
 JENNINGS RADIO MFG. CO., P. O. Box 1278, San Jose 8, Calif.—E  
 KOLLSMAN INSTRUMENT, 80-08 45 Ave., Elmhurst, L.I., N.Y.—D  
 Kupfrian Mfg. Co., 367 State St., Binghamton, N.Y.—D

Lavoie Labs., Inc., Morganville, N.J.—B,C,D  
 Mallory & Co., P.R., 3029 E. Washington St., Indianapolis 6, Ind.—E  
 Metron Instrument Co., 432 Lincoln St., Denver, Colo.—A  
 Millen Mfg. Co., James, 150 Exchange St., Malden, Mass.—A,E  
 Mission-Western Engineers, Inc., 132 W. Colo. St., Pasadena 1, Calif.—A,C  
 Mycalex Corp. of America, Clifton Blvd., Clifton, N.J.—B  
 North Hills Electric Co., Box 427, Great Neck, N.Y.—F  
 Petroff, Peter A., 127 Water St., New York 5, N.Y.—A,D  
 Pilot Radio Corp., 37-06 36 St., Long Island City 1, N.Y.—D  
 Research Instrument Co., 233 Broadway, New York 7, N.Y.—A,C  
 Rich Electronics, Inc., 212 N. W. 8 Ave., Miami 36, Fla.—D  
 Roesch Co., D. J., 2200 S. Figueroa St., Los Angeles 7, Calif.—D  
 Ruckelshaus Labs., Inc., John G., 110 Pomerory Rd., Madison, N.J.—D  
 Rust Industrial Co., 608 Willow St., Manchester, N.H.—C,D  
 Ryan Industries, Inc., 19159 John R. St., Detroit 3, Mich.—D  
 Sickles, F. W. Div., General Instrument Corp., P.O. Box 330, Chicopee, Mass.—E,F  
 Solar Mfg. Corp., 2660 E. 46 St., Los Angeles 58, Calif.—E  
 Standard Coil Products Co., 2329 N. Pulaski Rd., Chicago 39, Ill.—B,E,F  
 Tallon Co., 159 Carlton Ave., B'klyn, N.Y.—D  
 White Industries, 421 W. 54 St., New York 19, N.Y.—A  
 Willys-Overland Motors, 6225 Benore Rd., Toledo, Ohio—A

**99—WIRE, CABLE & WAVEGUIDE**

Bus bar ..... AR  
 Cable, antenna transmission, receiving ..... A  
 Cable, antenna transmission, transmitting ..... B  
 Cable, assemblies ..... C  
 Cable, coaxial ..... D  
 Cable, flat woven ..... E  
 Cable, insulated ..... F  
 Cable, microphone ..... G  
 Cable, shielded ..... H  
 Cable, ignition ..... I  
 Cable, solid dielectric ..... J  
 Cable, UHF ..... K  
 Cords, attachment ..... L  
 Cords, resistance ..... M  
 Slotted Lines ..... AQ  
 Test Leads ..... AP  
 Transmission line ..... AO  
 Wire, aluminum ..... N  
 Wire, asbestos insulated ..... O  
 Wire, ceramic insulated ..... P  
 Wire, copper, bare ..... Q  
 Wire, copper, insulated ..... R  
 Wire, enameled ..... S  
 Wire, filament ..... T  
 Wire, glass insulated ..... U  
 Wire, guy ..... V  
 Wire, harnesses ..... W  
 Wire, high voltage ..... X  
 Wire, hookup ..... Y  
 Wire, litz ..... Z  
 Wire, magnet ..... AA  
 Wire, magnetic recording ..... AB  
 Wire, nickel-clad copper ..... AC  
 Wire, phosphor bronze ..... AD  
 Wire, plastic insulated ..... AE  
 Wire, platinum ..... AF  
 Wire Reels ..... AS  
 Wire, resistance ..... AG  
 Wire, shielded ..... AH  
 Wire, silver plated ..... AI  
 Wire, steel ..... AJ  
 Wire, tantalum ..... AK  
 Wire, tungsten ..... AL  
 Waveguides, flexible ..... AM  
 Waveguides, rigid ..... AN

AIRTRON, INC., 1109 W. Elizabeth Ave., Linden, N. J.—AM,AN  
 ALDEN PRODUCTS CO., 117 N. Main St., Brockton 64, Mass.—C,F,H,L,R,U,AE,AH,AP  
 Allied Allegri Machine Co., 141 River Rd., Nutley 10, N.J.—C,L  
 Allied Research & Eng'g, Inc., 1041 N. Las Palmas Ave., Hollywood 38, Calif.—AN,AQ  
 Alloy Metal Wire Co., 13 & Penna. Ave., Prospect Park, Pa.—AC, AG  
 Alpha Wire Co., 430 Broadway, New York 13, N. Y.—A,B,D,E,F,G,H,I,J,L,Q,R,T,U,V,X,Y, AA,AD,AE,AH  
 American Electric Cable Co., 181 Appleton St., Holyoke, Mass.—Q,R,U,Y,AE,AG,AH  
 AMERICAN PHENOLIC CORP., 1830 S. 54 Ave., Chicago 50, Ill.—A,B,C,D,F,G,H,J,K,R, X,Y,AE,AH,AI,AO  
 American Radio Hardware Co., 152 Mac-Questen P'wy S., Mount Vernon, N.Y.—AP  
 American Radionic Co., 33 Flatbush Ave., Brooklyn 17, N.Y.—C  
 American Silver Co., 36-07 Prince St., Flushing, N.Y.—AM  
 Anaconda Wire & Cable Co., 25 Broadway, New York, N.Y.—A,B,D,F,H,K,Q,R,S,U,X,Y, AA,AD,AE,AH  
 ANDREW CORP., 363 E 75 St., Chicago 19, Ill.—B,D,K,AN,AO,AQ  
 Arey Machine Co., 38 Long Ave., Hillside 5, N.J.—L,M,AP  
 Argyle Electronics Co., 8 W. 18 St., New York 11, N.Y.—A,K,AO  
 Autel Electronics Co., 1947 Farmingdale Rd., Westfield, N.J.—C,AN  
 Baughman Co., E.J., 350 S. Central, Los Angeles 13, Calif.—D  
 Belden Mfg. Co., 4647 W. Van Buren St., Chicago 44, Ill.—D,G,L,O,R,S,X,Y,AA,AO  
 Birnbach Radio, 145 Hudson St., New York, N.Y.—A,B,F,G,H,I,K,L,N,Q,R,T,U,V,X,Y, Z,AD,AE,AH,AP,AR  
 Blair Co. J.P., 89 Union St., Mineola, N.Y.—AN,AQ  
 BOGART MFG CO., 315 Seigel St., Brooklyn 6, N.Y.—AM,AN,AO,AQ  
 Boston Insulated Wire & Cable Co., 65 Bay St., Dorchester 25, Mass.—B,D,F,H,I,J,K,R,U,X, Y,AE,AH  
 BRAND & CO., WM., North & Valley Sts., Willimantic, Conn.—A,B,C,D,F,G,H,K,M,R, S,U,X,Y,AE,AH,AJ  
 Bristol Eng'g Corp., Lincoln & Pond Sts., Bristol, Pa.—AQ  
 Brooks Radio & TV Corp., 84 Vesey St., New York 7, N.Y.—D,K  
 Euggie & Co., H. H., 726 Stanton St., Toledo 1, Ohio—C  
 Camburn, Inc., 32-40 57 St., Woodside 77, N.Y.—A,AO  
 Carol Cable Co., 20 Central Ave., Pawtucket, R.I.—A,B,C,D,E,F,G,H,I,Q,R,AE,AH  
 Carpenter Steel Co., 101 W. Bern St., Reading, Pa.—AJ  
 Cascade Research Corp., 53 Victory Lane, Los Gatos, Calif.—AO  
 Century Electronics, div. Century Metalcraft 14806 Oxnard, Van Nuys, Calif.—AN  
 Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.—F,Q,R,V,AA,AD,AR  
 Chester Cable Co., 100 Hill Ave., Chester, N.Y. A, D, F, G, H, I, J, K, L, M, N, O, Q, R, E, U, X, Y, Z, AA, AG, AH, AM  
 Chester-Morton Electronics Corp., 10 St., and Morton Ave., Chester, Pa.—C,L,M  
 Citation Products Co., 233 E. 146 St., New York 51, N.Y.—AP

**98—TUNING PARTS**

Gear units ..... A  
 Mechanical selectors ..... B  
 Motor operated units ..... C  
 Remote control ..... D  
 Trimmer capacitors ..... E  
 Trimmer inductances ..... F

AEROVOX CORP., 740 Belleville Ave., New Bedford, Mass.—E  
 Allied Int'l Inc., 230 Park Ave., New York 17, N.Y.—D  
 All Star Products, Inc., Defiance, Ohio—E

Accurate Insulated Wire Corp., 25 Fox St., New Haven 13, Conn.—A,D,F,G,H,L,R,U,Y, AE, AH  
 Advance Insulated Wire & Cable, P. O. Box 1026, Plainfield, N.J.—A,D,F,G,H,I,J,K,L,R, U,X,Y,AE,AH,AO  
 Aerolite Electronics Corp., 507-26 St., Union City, N.J.—C,L,A,P  
 Aeronautical Radio Mfg. Co., 155 1 St., Mineola, N.Y.—A,B,D,F,G

Clearbeam TV Antenna Co., 100 Prospect Ave., Burbank, Calif.—K,R  
 Coaxial Connector Co., 35 N. 2 Ave., Mount Vernon, N.Y.—C,A,N,AO  
 Cohn Corp., Sigmund, 121 S. Columbus Ave., Mount Vernon, N.Y.—AD,AF  
 Color Television Inc., 973 E. San Carlos Ave., San Carlos, Calif.—C  
 Columbia Technical Corp., 5 E. 57 St., New York 22, N.Y.—A,B,C,D,F,G,H,J  
 Columbia Wire & Supply, 2850 Irving Park Rd., Chicago, Ill.—D,G,N,O,Q,R,S,U,V,X,Y,AA,AE,AH,AO  
 Consolidated Wire & Associated Co.'s., 1635 S. Clinton St., Chicago 16, Ill.—O,Q,R,S,U,X,Y,AA,AD,AE,AH  
 Continental Electronics Mfg. Co., 4212 S. Buckner Blvd., Dallas 10, Texas—D  
 Co-operative Industries, Inc., 100 Oakdale Rd., Chester, N.J.—H,A,H,A,M,A,N  
 Copperweld Steel Co., Glassport, Pa.—A,B,Q,V  
 CORNISH WIRE CO., 50 Church St., New York 7, N.Y.—A,B,C,D,E,F,G,H,K,L,Q,P,R,U,V,X,Y,AE,AH  
 Costelow Co., John A., 125 Kansas Ave., Topeka, Kan.—AO  
 CROSBY LABS., INC., Robbins Lane, Hicksville L.I., N.Y.—A  
 Cubic Corp., Scott & Cannon Sts., San Diego 6, Calif.  
 Custom Electronics Corp., 738 Speedwell Ave., Morris Plains, N.J.—C  
 Decade Instr., Box 153, Caldwell, N.J.—AN  
 Decatur Electronic Industries Corp., 1620 Decatur St., Brooklyn 27, N.Y.—C,D,F,K,L,AP  
 Dielectric Materials Co., 5315 N. Ravenswood A,B,D,F,G,H,K,R,U,X,Y,AE,AH  
 Diamond Microwave Corp., 7 North Ave., Wakefield, Mass.—D,AN  
 Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.—F  
 Dorne & Margolin, 30 Sylvester St., Westbury, N.Y.—AO  
 Driver Co., Wilbur R., Riverside Ave., Newark 4, N.J.—AG  
 Dubrow Devel., 235 Penn., Burlington, N.J.—AQ  
 Eagle Electric Mfg. Co., 23-10 Bridge Plaza S., Long Island City, N.Y.—L  
 EBY, HUGH H., 4700 Stenton Ave., Philadelphia 44, Pa.—C  
 Eldi Electronic Devices, 204 W. Houston St., New York 14, N.Y.—C,AP  
 Electro-Tech Equip. Co., 300 Canal St., New York, N.Y.—AP  
 Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio—AQ  
 Ericson Mfg. Co., 5209 Euclid Ave., Cleveland 3, Ohio—L  
 Espey Mfg., 528 E. 72, New York, N.Y.—AQ  
 Essex Wire Corp., 1601 Wall St., Fort Wayne 6, Ind.—C,F,G,H,I,N,Q,R,S,U,AA,AE,AH  
 Federal Telecommunication Labs. Inc., 500 Washington Pl., Nutley, N.J.—AQ  
 FEDERAL TELEPHONE & RADIO, 100 Kingsland Rd., Clifton, N.J.—A,B,C,D,H,J  
 Felts Corp., Microdot Div., 1826 Fremont Ave., S. Pasadena, Calif.—A,B,C,F,G,H,K,L  
 Ferris Instrument Co., 110 Correlia St., Boonton, N.J.—AQ  
 Ferro Electric Prod., Kirkland, Ill.—A,K,N  
 Fretco, Inc., 1041 Forbes St., Pittsburgh 19, Pa.—A,B,C,K,N,A,N,AO  
 GATES RADIO, 123 Hampshire, Quincy, Ill.—B,D  
 Gavitt Mfg. Co., Brookfield, Mass.—C,F,H,L,M,R,AE,AH  
 General Cable Corp., 420 Lexington Ave., New York 17, N.Y.—F,G,H,I,N,O,Q,R,S,U,Y,AC  
 General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—F,A,P  
 GENERAL ELECTRIC CO., Construction Materials Div., 1285 Boston Ave., Bridgeport 2, Conn.—F,H,L,O,S,U,Y,AA,AE,AH  
 GENERAL ELECTRIC CO., Monowatt Dept., 95 Hathaway St., Providence 7, R.I.—C  
 General Insulated Wire Works, 69 Gordon Ave., Providence, R.I.—D,F,G,H,L  
 GENERAL PRECISION LAB. INC., 63 Bedford Rd., Pleasantville, N.Y.—AN  
 GENERAL RADIO CO., 275 Mass. Ave., Cambridge 39, Mass.—D,AP,AQ  
 Goldsmith Bros. Smelting & Ref. Co., 111 N. Wabash Ave., Chicago 2, Ill.—AF,AI  
 Gosnet Co., 801 S. Main St., Burbank, Calif.—A,AO  
 G. W. Assoc., Box 2263, El Segundo, Calif.—AM,AN,AQ  
 Haft & Sons, 950 Kent, Brooklyn 5, N.Y.—Y  
 Hallett Mfg. Co., 1601 W. Florence Ave., Inglewood, Calif.—H,I,IAH  
 HEMINWAY & BARTLETT, 500 5 Ave., New York 36, N.Y.—E  
 Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.—AQ  
 Hudson Wire Co., Ossining, N.Y.—N,Q,R,S,U,Z,AA,AD,AI  
 Imperial Radar & Wire Corp., 4342 Bronx Blvd., New York 66, N.Y.—A,B,F,K,N,Q,R,S,V,AO  
 INCA Mfg. Div., Phelps Dodge Copper Prods., Ft. Wayne, Ind.—S,U,AA  
 Industrial Wire Products, 1106 Carnegie Ave., Cleveland 15, Ohio—C,L,M  
 Instrument Wire Co., 158 Church St., Guilford, Conn.  
 INSULINE CORP. OF AMERICA, 36-02 35 Ave., Long Island City, N.Y.—M,AP  
 Isolantite Mfg. Corp., Warren Ave., Stirling, N.J.—AO  
 Jelliff Mfg., Southport, Conn.—S,U,AA,AG  
 Jersey Specialty Co., Burgess Pl., Mountain-

**ELECTRONIC INDUSTRIES DIRECTORY**

view, N.J.—A,D,F,J,K,L,Q,R,AE  
 Jiffy Clip Mfg. Co., 128 Clinton Ave., Huntington, N.Y.—AP  
 JFD Mfg. Co., 6101 16 Ave., Brooklyn 4, N.Y.—A,M,N,R,X,AO,AP  
 JOHNSON CO., E. F., Waseca, Minn.—B,D,AO  
 Kantnal, Amelia Pl., Stamford, Conn.—AG  
 Kaywoff Products Co., Overton, Nebr.—AE  
 Kellogg Co., M. W., P. O. Box 469, Jersey City, N.J.—Y  
 KELLOGG SWITCHBOARD & SUPPLY CO., 79 W. Monroe St., Chicago 3, Ill.—Q,R  
 Kerrigan Lewis Mfg. Co., 4421 W. Rice St., Chicago 51, Ill.—Z,AA  
 Keystone Electronics Corp., 423 Broome St., New York 12, N.Y.—AP  
 Keystone Watch Case Div., Riverside Metal Co., 1 Pavilion Ave., Riverside, N.J.—AD  
 Kings Microwave Co., 719 Main St., New Rochelle, N.Y.—AN,AQ  
 Kinney Co., Rosslyn Rd., Carnegie, Pa.—AN  
 Kliegl Bros., 321 W. 50 St., N.Y. 19, N.Y.—L  
 Koiled Kords, Inc., Box K, New Haven 14, Conn.—F,G,H,L,N  
 Kolton Electric Mfg. Co., 125 N.J. Railroad Ave., Newark 5, N.J.—AR  
 Korb Engr. & Mfg. Co., 30 Ottawa Ave., Grandville, Mich.—AN  
 Kulka Electric Mfg. Co., 633 S. Fulton Ave., Mount Vernon, N.Y.—L  
 La Pointe Electronics, Inc., 155 W. Main St., Rockville, Conn.—AO  
 Lee Electronic Labs. Inc., 233 Dudley St., Boston 13, Mass.—AP  
 LENZ ELECTRIC MFG. CO., 1751 N. Western Ave., Chicago 47, Ill.—C,D,E,F,G,H,L,R,U,X,Y,AH  
 Lerner Instrument & Electronics Mfg. Corp., GPO Box 620, Brooklyn 1, N.Y.—AN,AO,AQ  
 Lewis Eng'g Co., Naugatuck, Conn.—AG  
 Lynch Carrier Systems, Inc., 96 Jessie St., San Francisco 5, Calif.—AO  
 Mackay Inc., A.D., 198 Broadway, New York 38, N.Y.—N,Q,T,AK,AP  
 MacKenzie Products Co., 141 Brewery St., New Haven, Conn.—AN  
 Marconi's Wireless Telegraph Co., 23 Beaver St., New York 4, N.Y.—AO  
 Mark Products Co., 3547 Montrose Ave., Chicago 18, Ill.—A,B,AQ  
 Mendelsohn Speedgun Co., 457 Bloomfield Ave., Bloomfield, N.J.—C  
 Mercury Eng'g Corp., 399 E. Cottage Pl., York, Pa.—C  
 Metals & Controls Corp., General Plate Div., 34 Forest, Attleboro, Mass.—AC,AF,AI,AN  
 MICROWAVE ASSOCIATES, 22 Cunningham St., Boston 15, Mass.  
 Microwave Devel. Labs. Inc., 22D Grove St., Waltham 54, Mass.—AN  
 Miller Electric Co., 120 Main St., Pawtucket, R.I.—L,O,Y,AE  
 Modelectric Products, Asbury Park, N.J.—C  
 Modern Wire Co., 39-39 Review Ave., Long Island City 1, N.Y.—N,Q,V,AJ  
 Moore Tool Works, 1311 Riverside Dr., Los Angeles 31, Calif.—L  
 National Electrical Products, P. O. Box 897, Pittsburgh 30, Pa.—A,D,F,G,H,I,J,K,L,Q,R,S,V,X,AM,AN,AO,AR  
 New England Electrical Works 365 Main St., Lisbon, N.H.—E,F,H,R,S,Z,AA  
 Ney Co., J. M., Hartford 1, Conn.—AG  
 Nichols Products Co., 325 W. Main St., Moorestown, N.J.—AN, AQ  
 Monotuck Mfg., Water St., Holyoke, Mass.—Q  
 N.R.K. MFG. & ENG'G CO., 4601 W. Addison St., Chicago 41, Ill.—AO  
 Okonite Co., Passaic St., Passaic, N.J.—D,F,G,H,I,J,X,AE,AH  
 Olympic Instr., Box 2020, Cove, Wash.—AS  
 Pacific Electricord Co., 3217 Exposition Pl., Los Angeles 18, Calif.—C,D,L,M  
 Pacific Mercury Research Center, 1500 Mission Canyon Rd., Santa Barbara, Calif.—C,W  
 Perma-Power Co., 4727 N. Damen Ave., Chicago 25, Ill.—C,X,AE  
 Petroff, Peter A., 127-9 Water St., New York 5, N.Y.—A,B,C,D  
 PHALO PLASTICS CORP., 25 Foster St., Worcester 8, Mass.—C,D,F,G,H,J,K,L,R,X,Y,AE,AH  
 Phelps Dodge Copper Products, 40 Wall St., New York 5, N.Y.—A,B,D,F,G,H,J,K,L,O,Q,R,S,U,X,Y,AA,AD,AE,AH,AR  
 Philmore Mfg. Co., 113 University Pl., New York 3, N.Y.—M,T,Y,AE,AR  
 Plastic Wire & Cable Corp., E. Main St., Jewett City, Conn.—D,F,G,H,I,L,R,Y,AH  
 Plastoid Corp., 42-61 24 St., Long Island City 1, N.Y.—A,D,F,G,H,K,R,U,X,Y,AE,AH  
 Precision Apparatus Co., 92-27 Horace Harding Blvd., Elmhurst, L.I., N.Y.—AP  
 Premier Instrument Corp., 52 W. Houston St., New York 12, N.Y.—AN  
 Press Wireless Mfg., Rockville, Conn.—AQ  
 PRODELIN, INC., 307 Bergen Ave., Kearny, N.J.—B,D,K,AN,AO  
 Product Development Co., Kearny, N.J.—B,D,AN

RADIO CORP. OF AMERICA, RCA VICTOR DIV., Front & Cooper St., Camden 2, N.J.—G,H,AO  
 Radio Kits, 120 Cedar, New York 6, N.Y.—AP  
 Radio Merchandise Sales, 2016 Bronxdale Ave., New York 60, N.Y.—A,K,Q,AO  
 REA Magnet Wire Co., Inc., 3610 E. Pontiac St., Fort Wayne 4, Ind.—AA  
 Rego Insulated Wire Co., 830 Monroe St., Hoboken, N.J.—D,G,R,X,Y  
 Remco Mfg., 545 N. LaSalle, Chicago, Ill.—C  
 Rhode Island Insulated Wire Co., 624 S. Michigan Blvd., Chicago, Ill.—F,H,L,M,N,O,R,U,Y,Z,AE  
 Rockbestos Products Corp., 285 Nicoll St., New Haven 4, Conn.—O,U,X,Y,AA,AE  
 Rodale Mfg. Co., Emmaus, Pa.—L,M  
 Roesch Co., D.J., 2200 S. Figueroa St., Los Angeles 7, Calif.—C  
 Rofan Co., Topsfield, Mass.—AN  
 Rollin Co., 2010 N. Lincoln Ave., Pasadena 3, Calif.—AQ  
 Rome Cable Corp., Rome, N.Y.—D,F,G,H,L,N,O,Q,R,U,X,Y,AA,AE,AH  
 Rowe indust., 1702 Wayne, Toledo, Ohio—C  
 Runzel Cord & Wire Co., 4723 W. Montrose Ave., Chicago 41, Ill.—C,E,F,G,H,L,Q,R,U,Y,AE,AH  
 Rupp's Assembling & Mfg., 2341 N. Seminary Ave., Chicago 14, Ill.—C,F,G,L,O,R,Y  
 Saxl Instrument Co., Harvard, Mass.—AN  
 Schutter Mfg. Co., Carl W., 80 E. Montauk Highway, Lindenhurst, N.Y.—AM,AN  
 Scientific Assembly Co., 65 Hope St., Brooklyn 11, N.Y.—C  
 Sears Co., M. J., 52 Clark, Brooklyn 2, N.Y.—L  
 Selector Industries, 401 E. 138 St., New York 54, N.Y.—C,L,AN,AO,AQ  
 Sequoia Process Corp., 881 Douglas Ave., Redwood City, Calif.—F,R,Y,AE  
 Sightmaster of California Co., Gillespie Airport, Santee, Calif.—AM,AN  
 Sightmaster Corp., 111 Cedar St., New Rochelle, N.Y.—AM,AN  
 Sittler, 18 N. Ada St., Chicago, Ill.—Q,AP  
 Smith Mfg. Co., F. H., 3047 W. Carroll Ave., Chicago 12, Ill.—L  
 Smith Inc., H., 436-18 St., B'kln., N.Y.—X,AP  
 Specialty Assembling, 79 Clifton Pl., Brooklyn 38, N.Y.—A,H,V,AP  
 SPRAGUE ELECTRIC CO., 233 Marshall St., North Adams, Mass.—P,AA  
 Standard Electronics Corp., 285 Emmet St., Newark 5, N.J.—AO,AQ  
 Stromberg-Carlson Co., Rochester 3, N. Y.—C,F,L,R  
 Suprenant Mfg. Co., 199 Washington St., Boston 8, Mass.—D,F,R,U,X,Y,AE,AH,AI  
 Tallen Co., 159 Carlton Ave., Brooklyn 5, N.Y.—A,B,C,D,G,K,L,M,V,AM,AN  
 Technicraft Labs. Inc., Thomaston-Waterbury Rd., Thomaston, Conn.—B,AM,AN,AQ  
 Telerad Mfg. Corp., 1440 Broadway, New York 18, N.Y.—AO  
 Telex, 1633 Eustis St., St. Paul, Minn.—L  
 Tensolite Insulated Wire Co., 198 Main St., Tarrytown, N. Y.—C,D,F,H,R,Y,AE,AH,AI  
 Thompson Clock, Bristol, Conn.—L,V,AR  
 Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N.J.—AM,AN  
 Torngren Co., C. W., 236 Pearl St., Somerville, Mass.—AN  
 Tricon Mfg., 8098 Wallace St., Chicago, Ill.—AF  
 Tricraft Products Corp., 1335 N. Ashland Ave., Chicago 22, Ill.—C  
 Trilsch Co., John D., 1310 McKinney Ave., Houston, Texas—D,AM,AN,AO  
 T.V. Development Corp., 2024 McDonald Ave., Brooklyn 23, N.Y.—AO  
 T-V Products Co., 152 Sandford St., Brooklyn 5, N.Y.—C  
 U.S. Tower Co., 219 Union Trust Bldg., Petersburg, Va.—V,AO  
 U.S. Wire & Cable, Progress & Monroe Sts., Union, N.J.—A,B,D,F,G,H,I,J,K,R,X,Y,AH  
 Universal Mfg. Co., Micro-Wave Div., 410 Hillside Ave., Hillside, N.J.—AN,AQ  
 Univex, 102 Warren, New York 7, N.Y.—AO  
 Varflex Corp., 305 N. Jay St., Rome, N.Y.—U  
 Walden Electronics, Inc., 911 N. Larrabee St., Chicago 10, Ill.—L  
 Ward Products Corp., Div. Gabriel Co., 1148 Euclid Ave., Cleveland 15, Ohio.—K,AO  
 Warren Wire Co., Pownal, Vt.—AA,AG  
 Waveline, Passaic Ave., Caldwell, N.J.—AN,AQ  
 Welch Electric Co., 1221 Wade St., Cincinnati 14, Ohio.—C  
 Western Electronic Enterprises, 3348 W. Compton Blvd., Gardena, Calif.—D,AN  
 Western Gold & Platinum Works, 589 Bryant St., San Francisco 7, Calif.—AF  
 Western International Co., 45 Vesey St., New York 7, N.Y.—D,G,H,K,AH,AN,AP  
 Western Mfg. Co., 1400 W. 22 St., Kearny, Nebr.—A,D,K,AO  
 Weymouth Instrument Co., 140 Commercial St., E. Weymouth 89, Mass.—AQ  
 WHITE & SONS, JAMES L., 374 Verona Ave., Newark 4, N.J.—AN  
 Whitaker Cable Corp., 1301 Burlington Ave., N. Kansas City 16, Mo.—E,F,H,I,J,N,Q,R,S,Y,AE,AH  
 Whitney Blake Co., 1565 Dixwell Ave., New Haven 14, Conn.—C,D,F,G,H,J,L,R,AI,AH  
 Wind Turbine Co., El Market St. & Penn. R.R., West Chester, Pa.  
 Winsted Div., Hudson Wire Co., Main St., Winsted, Conn.—AA  
 WORKSHOP ASSOCIATES DIV., Gabriel Co., Endicott St., Norwood, Mass.—B,D,K,AN,AO

# 1953 ELECTRONIC INDUSTRIES DIRECTORY

## *Brand & Trade Name Index*

The brand names of the products, equipment, instruments, and materials in the radio-TV-electronic and related industries are listed alphabetically, with the name of the manufacturer.

The address of the manufacturer whose brand or trade name is listed may be obtained by referring to the Alphabetical Listing of Manufacturers, beginning on page 312.

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|--|--|--|---|---|---|
| <p>A-B QUALITY<br/>Allen-Bradley Co.</p> <p>ACCOUSTALLOY<br/>Electro-Voice</p> <p>ACOUSTICEL<br/>Brush Electronics Corp.</p> <p>ACCURAY<br/>Industrial Neutronics</p> <p>ACE<br/>Crosley Div., Avco Mfg.</p> <p>ACRAWAXC<br/>Glyco Prods. Co.</p> <p>ACROBOSS<br/>Acromark Co.</p> <p>ACRODIE<br/>Acromark Co.</p> <p>ACROETCH<br/>Acromark Co.</p> <p>ACROGRAVE<br/>Acromark Co.</p> <p>ACROPRENE<br/>Acromark Co.</p> <p>ACROPRINTER<br/>Acromark Co.</p> <p>ACROSTAMP<br/>Acromark Co.</p> <p>ADAPEC<br/>Centralab Div.<br/>Globe-Union, Inc.</p> <p>ADASHAFT<br/>Central AB Div.<br/>Globe-Union, Inc.</p> <p>AD-A-SWITCH<br/>Clarostat Mfg. Co.</p> <p>ADD-A-SECTION<br/>Alpar Mfg. Co.</p> <p>ADDITIVE DRIVE<br/>Electro-Voice, Inc.</p> <p>ADELCO<br/>Advance Electronics Co.</p> <p>ADJUST-A-CONE<br/>Quam-Nichols Co.</p> <p>ADJUST-A-VOLT<br/>Standard Electrical Products Co.</p> <p>ADJUSTOHM<br/>Ward Leonard Electric</p> <p>ADLAKE<br/>Adams &amp; Westlake</p> <p>ADVANCETRON<br/>Advance Electronics Co.</p> <p>AECO<br/>American Electric Cable</p> <p>AERCOM<br/>Aeronautical Comm. Equip.</p> <p>AEROCON<br/>Aerovox Corp.</p> <p>AERODYNAMIC<br/>Radio Corp. of America</p> <p>AEROFILM<br/>Aerovox Corp.</p> <p>AEROLENE<br/>Aerovox Corp.</p> <p>AEROLITE<br/>Aerovox Corp.</p> <p>AERO-MAGNETTE<br/>Heinemann Electric Co.</p> <p>AERO-SEAL<br/>Breeze Corporations, Inc.</p> <p>AERO-THREAD<br/>Heli-Coil Corp.</p> <p>AEROTRON<br/>Aeronautical Electronics</p> <p>AFSCO<br/>A. F. Smuckler &amp; Co.</p> <p>AGA<br/>Elastic Stop Nut Corp.</p> <p>AGASTAT<br/>Elastic Stop Nut Corp.</p> <p>AGF<br/>American Gas Furnace</p> <p>AIL<br/>Airborne Instruments Lab.</p> <p>AIRBOY<br/>Mitchell Industries</p> | <p>AIRBRASIVE<br/>S. S. White Dental Mfg.</p> <p>AIRCELL<br/>National Carbon Co.</p> <p>AIR GENERAL<br/>Brach Mfg. Corp.</p> <p>AIR INDUCTORS<br/>Barker &amp; Williamson</p> <p>AIR KING<br/>CBS Columbia, Inc.</p> <p>AIRMASTER<br/>Automatic Radio Mfg.</p> <p>AIR-METERS<br/>Hastings Instrument Co.</p> <p>AIR QUEEN<br/>CBS-Columbia, Inc.</p> <p>AKRA-OHM<br/>Shallcross Mfg. Co.</p> <p>ALATHON<br/>E. I. DuPont de Nemours Polychemicals Dept.</p> <p>ALCHROME<br/>Wilbur B. Driver Co.</p> <p>ALCO<br/>American Lava Co.</p> <p>ALCUPATE<br/>Metals &amp; Controls</p> <p>ALFER<br/>Metals &amp; Controls</p> <p>ALL-WEATHER<br/>S. S. White Dental Mfg.</p> <p>ALLIEDINTER<br/>Allied International Eng'g Div.</p> <p>ALLISON SKYBORNE TOWERS<br/>Allison Steel Mfg.</p> <p>ALNICO<br/>Arnold Engineering</p> <p>ALNIFER<br/>Metals &amp; Controls</p> <p>ALODINE<br/>American Chemical Co.</p> <p>ALSIMAG<br/>American Lava Corp.</p> <p>ALSIPATE<br/>Metals &amp; Controls</p> <p>ALUMAWELD<br/>Johnson Mfg. Co.</p> <p>AM<br/>Austin Co.</p> <p>AMCO<br/>American Solder &amp; Flux Co.</p> <p>AMCON<br/>American Condenser Co.</p> <p>AMECO<br/>Western Electronic Enterprises</p> <p>AMELCO<br/>American Electroneering Corp.</p> <p>AMERICAN BEAUTY<br/>American Electrical Heater Co.</p> <p>AMERECON<br/>American Relays &amp; Controls, Inc.</p> <p>AMERTRAN<br/>Standard Electronics Co.</p> <p>AMF<br/>Sterling Eng'g</p> <p>AMINCO<br/>American Instrument Co.</p> <p>AMP<br/>Aircraft-Marine Products</p> <p>AMPEC<br/>Centralab Div., Globe-Union, Inc.</p> <p>AMPHENOL<br/>American Phenolic Corp.</p> <p>AMPLI-VISION<br/>International Telemeter Corp.</p> | <p>AMRAD<br/>Crosley Div.</p> <p>ANGLE DR'VE<br/>James Vibrapower</p> <p>ANGLGEAR<br/>Airborne Accessories Corp.</p> <p>ANOFLEX<br/>Neal Feay Co.</p> <p>ANSER<br/>Davies Laboratories, Inc.</p> <p>ANTENAPLEX<br/>Radio Corp. of America</p> <p>ANTILINK<br/>American Bolt &amp; Nut Fastener Co.</p> <p>AO<br/>American Optical Instrument Co.</p> <p>AQUADAG<br/>Acheson Colloids Co.</p> <p>AQUAFIN<br/>Fred Stein Labs.</p> <p>ARALDITE<br/>Ciba Co.</p> <p>ARC<br/>Aircraft Radio Corp.</p> <p>ARCADIA<br/>Wells-Gardner &amp; Co.</p> <p>ARDUX<br/>Ciba Co.</p> <p>ARGYLINE<br/>Argyle Electronics Co.</p> <p>ARHCO<br/>American Radio Hardware Co.</p> <p>ARHCOITE<br/>American Radio Hardware Co.</p> <p>ARISTOCRAT<br/>Electro-Voice, Inc.</p> <p>ARKAY<br/>Radio Kits, Inc.</p> <p>ARMCO<br/>Armco Steel Corp.</p> <p>ASCO<br/>Automatic Switch Co.</p> <p>ASCOP<br/>Applied Science Corp. of Princeton</p> <p>ATCOTRAN<br/>Automatic Temperature Control Co.</p> <p>ATLAS<br/>Automatic Radio Mfg.</p> <p>ATOM<br/>Sprague Electric Co.</p> <p>ATR<br/>American Television &amp; Radio Co.</p> <p>AUDAX<br/>Audak Co.</p> <p>AUDET<br/>Centralab Div., Globe-Union, Inc.</p> <p>AUDIGAGE<br/>Branson Instruments, Inc.</p> <p>AUDIO-AID<br/>Arihur Ansley Mfg. Co.</p> <p>AUDIOID<br/>Cook Laboratories</p> <p>AUDIODISCS<br/>Audio Devices, Inc.</p> <p>AUDIOFILM<br/>Audio Devices, Inc.</p> <p>AUDIO-GRAPHIC<br/>Audio-Tone Oscillator</p> <p>AUDIO-MIX<br/>Pentron Corp.</p> <p>AUDIO POINTS<br/>Audio Devices, Inc.</p> <p>AUDIOSCOPE<br/>Audio Master Corp.</p> <p>AUDIOTAPE<br/>Audio Devices, Inc.</p> | <p>AUDITORIUM<br/>Jensen Mfg. Co.</p> <p>AURICON<br/>Berndt-Bach, Inc.</p> <p>AUTOBOOSTER<br/>Industrial Television</p> <p>AUTOGRAPHS<br/>Metalcraft, Inc.</p> <p>AUTOMASTER<br/>Automatic Radio Mfg.</p> <p>AUTOROLA<br/>Automatic Radio Mfg.</p> <p>AUTOSET<br/>Bristol Co.</p> <p>AUTOSYN<br/>Eclipse-Pioneer Div. Bendix Aviation</p> <p>AUTRONIC<br/>Swartwout Co.</p> <p>AVC<br/>Rockbestos Products</p> <p>AVIEN<br/>Aviation Engineering</p> <p>AVIGATOR<br/>Mitchell Industries</p> <p>AWH<br/>A. W. Haydon Co.</p> <p>AXIOHM<br/>Ward Leonard Electric</p> <p>AXIVANE<br/>Joy Mfg. Co.</p> <p>BABYCRY RELAY<br/>Electro Vision Lab.</p> <p>BAKELITE<br/>Bakelite Co., Div. Union Carbide &amp; Carbon Corp.</p> <p>BALCO<br/>Wilbur B. Driver Co.</p> <p>BALINE<br/>JFD Mfg. Co.</p> <p>BALLAST NICKEL<br/>Wilbur B. Driver Co.</p> <p>BALL-TENNA<br/>National Electronics</p> <p>BAND BOX<br/>Crosley Div.</p> <p>BANTAM<br/>Aerovox Corp.</p> <p>BANTAM-GT<br/>Hytron Radio &amp; Electronics Co.</p> <p>BANTAM JR<br/>BARCLAY Patwin Instruments</p> <p>BAREX<br/>King Laboratories, Inc.</p> <p>BARNES<br/>Barnes Metal Products</p> <p>BARONEXT<br/>Electro-Voice, Inc.</p> <p>BARRYMOUNTS<br/>Barry Corp.</p> <p>BASLER ELECTRIC COMPANY<br/>Basler Electric Co.</p> <p>BASS REFLEX<br/>Jensen Mfg. Co.</p> <p>BAZOOKA<br/>Industrial Eng'g Prods.</p> <p>BD<br/>Barnes Development Co.</p> <p>BEAM BENDER<br/>Technicraft Labs., Inc.</p> <p>BEL-ONE<br/>Bell Sound Systems, Inc.</p> <p>BENDIX FLIGHTWEIGHT RADIO<br/>Bendix Radio Div.</p> <p>BEN-HAR<br/>Bentley, Harris Mfg. Co.</p> <p>BEPCO<br/>Buchanan Electrical Products Corp.</p> <p>BERALOY A<br/>Wilbur B. Driver Co.</p> | <p>BERYLCO<br/>The Beryllium Corp.</p> <p>BESJET<br/>P. Wall Mfg. Co.</p> <p>BESTO-WIRE<br/>Rhode Island Insulated Wire Co.</p> <p>BH<br/>Bentley, Harris Mfg. Co.</p> <p>BICO<br/>Belock Instrument</p> <p>BILUXOR<br/>Par Products Corp.</p> <p>BI-MAG<br/>American Machine Foundry Co.</p> <p>BIMORPH<br/>Brush Electronics</p> <p>BI-SEAL<br/>Bishop Mfg. Corp.</p> <p>BISILOK<br/>Bishop Mfg. Corp.</p> <p>BLACK BEAUTY<br/>Sprague Electric Co.</p> <p>BLUEBIRD<br/>Radio Corp. of America</p> <p>BLUE JACKET<br/>Sprague Electric Co.</p> <p>BLUE SHAFT<br/>Centralab Div., Globe-Union, Inc.</p> <p>BLUE STREAK<br/>American Electric Cable Co.</p> <p>BOES-DAYTON<br/>Valtronics, Inc.</p> <p>BOMBARDER<br/>Scientific Electric Div. "S" Corrugated Quenched Gap Co.</p> <p>BONDEZE<br/>Phelps Dodge Copper Prods.</p> <p>BOND ROD<br/>H. B. Sherman Mfg. Co.</p> <p>BONDWICH<br/>Metals &amp; Controls Corp.</p> <p>BOR-AL-SIL<br/>Richard H. Bird &amp; Co.</p> <p>BOROFILM<br/>Wilkor Div., Aerovox Corp.</p> <p>BOSOL<br/>Blacher Chemical Mfg.</p> <p>B-PRENE<br/>Bishop Mfg. Corp.</p> <p>BRADLEYOMETERS<br/>Allen-Bradley Co.</p> <p>BRADLEYUNITS<br/>Allen-Bradley Co.</p> <p>BRANDES<br/>C. F. Cannon Co.</p> <p>BRAZE-CLAD<br/>American Silver Co.</p> <p>BRC<br/>Boonton Radio Corp.</p> <p>BRENKERT<br/>Radio Corp. of America</p> <p>BRISTOL'S<br/>Bristol Co.</p> <p>BRITECARB<br/>Wilbur B. Driver Co.</p> <p>BRONCO<br/>Metals &amp; Controls Corp.</p> <p>BROOK<br/>Caledonia Electronics &amp; Transformer Corp.</p> <p>BROWN DEVIL<br/>Ohmite Mfg. Co.</p> <p>BRUNSWICK<br/>Brunswick Div., Radio &amp; Television, Inc.</p> <p>BULPLATE<br/>Sprague Electric Co.</p> <p>BUSHEND<br/>Buchanan Electrical Products Corp.</p> | <p>BUTTON MICA<br/>Erie Resistor Corp.</p> <p>B &amp; W<br/>Barker &amp; Williamson, Inc.</p> <p>CADET<br/>Raytheon Mfg. Co.</p> <p>CALL-A-PHONE<br/>Talk-A-Phone Co.</p> <p>CALLMASTER<br/>Lyman Electronic Corp.</p> <p>CALTRON<br/>Caltron Products Co.</p> <p>CAMBRICOID<br/>American Electric Cable</p> <p>CAMCO<br/>Camburn, Inc.</p> <p>CANDOHM<br/>Muter Co.</p> <p>CANNON-BALL GRAND<br/>C. F. Cannon Co.</p> <p>CAPOHMIST<br/>Special Products Co.</p> <p>CARBIDIZED<br/>Ceramic Heater Cathode Resistor Co.</p> <p>CARBOFILM<br/>Aerovox Corp., Wilkor</p> <p>CARB-OHM<br/>Phaostron Co.</p> <p>CARBOLOY<br/>General Electric Co., Carboloy Dept.</p> <p>CARBOMITE<br/>Continental Carbon, Inc.</p> <p>CARDAX<br/>Electro-Voice, Inc.</p> <p>CARDYNE<br/>Electro-Voice, Inc.</p> <p>CARLTON<br/>Hudson Lamp Co.</p> <p>CARO<br/>Western Electronic Enterprises</p> <p>CARRILON DYNAMIC<br/>Miller Mfg. Co., M.A.</p> <p>CARTWHEEL<br/>Aerovox Corp.</p> <p>CASCADE<br/>Industrial Television</p> <p>CASTOHM<br/>Shallcross Mfg. Co.</p> <p>CATHAOLY<br/>CBS-Hytron</p> <p>CENTRALAB<br/>Hytron Radio &amp; Electronics Co. Superior Tube Co.</p> <p>CEE-CORS<br/>Permoflux Corp.</p> <p>CELCO<br/>Constantine Eng'g Lab.</p> <p>CELERON<br/>Continental-Diamond Fibre Co.</p> <p>CENCOIL<br/>Central Coil Co.</p> <p>CENTILATOR<br/>Kay Electric Co.</p> <p>CENTRADITE<br/>Centralab Div., Globe-Union, Inc.</p> <p>CENTRATHENE<br/>Centralab Div., Globe-Union, Inc.</p> <p>CEN-TRI-CORE<br/>Alpha Metals, Inc.</p> <p>CENTURY<br/>Electro-Voice, Inc.</p> <p>CERAMAG<br/>Stackpole Carbon Co.</p> <p>CERAMELEX<br/>Erie Resistor Corp.</p> |
|--|--|--|---|---|---|

# BRAND and TRADE NAME INDEX

CERAMICAPS  
Muter Co.  
CERAMICON  
Erie Resistor Corp.  
CERA-MITE  
Sprague Electric Co.  
CEROC  
Sprague Electric Co.  
CETRON  
Continental Electric Co.  
CETRON  
Western Electronic Enterprises  
CHALLENGER  
Radion Corp.  
CHALLENGER AMPLIFIERS  
David Bogen Co.  
CHAMPION  
Radion Corp.  
CHANALYST  
Radio Corp. of America  
CHANGE-A-CYCLE  
Carter Motor  
CHANNEL AUTOBOOSTER  
Industrial Television Inc.  
CHARG-A-MATIC  
Hertner Electric Co.  
CHARGICATORS  
Hickok Electrical Instrument Co.  
CHEMALLOW  
Sightmaster Corp.  
CHEMIFLEX  
Technicraft Supply Co.  
CHEMIGLAS  
Technicraft Supply Co.  
CHEM RAD  
Nuclear Instrument & Chemical Corp.  
CHEROKEE  
Sequoia Process Corp.  
CHERRIO  
Crosley Div., Avco Mfg. Corp.  
CHIEF  
Cannon Co., C. F.  
CHIPHONE  
Chicago Telephone Supply Corp.  
CHITVAN  
Chicago Transformer (Div. Essex Wire Corp.)  
CINE-VOICE  
Berndt-Bach, Inc.  
CIRCLE "B"  
Vocaline Co. of America  
CIRCLE COMPUTER  
Hogan Laboratories, Inc.  
CIRCLE ESS  
F. W. Stewart Mfg. Corp.  
CIRCUITMASTER  
Fordham Mfg. Co.  
CIVION  
Nuclear Instrument & Chemical Corp.  
CLARKSTAN  
Pacific Transducer Corp.  
CLASS MASTER  
Nuclear Instrument & Chemical Corp.  
CLETRON  
Cleveland Electronics, Inc.  
CLEVELITE  
Cleveland Container Co.  
CLIP-ON  
JFD Mfg. Co.  
CLOUDMASTER  
Nuclear Instrument & Chemical Corp.  
CML  
Communication Measurements Lab, Inc.  
COATINGAGE  
Branson Instruments  
COAXIAL  
Jensen Mfg. Co.  
COBANIC  
Wilbur B. Driver Co.  
COED  
Symphonic Radio & Electronic Corp.  
COIL-FLEX  
Ideal Industries, Inc.  
COLLEGIATE  
Symphonic Radio & Electronic Corp.  
COLOREDE  
Instrument Devel. Labs.  
COLOR-EYE  
Instrument Devel. Labs.  
COLORIMETER  
Sightmaster Corp.  
COLORTAN  
Natural Lighting Corp.  
COMCO  
Communications Co.  
COMET  
CBS-Columbia, Inc.  
COMMANDAIR  
JFD Mfg. Co.  
COMMUNO-PHONE  
David Bogen Co.

COMPENTROL  
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COMPO  
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CONCERT  
Jensen Mfg. Co.  
CONCERTAPE  
Electrosonic Specialties  
CONCERTO  
Symphonic Radio & Electronic Corp.  
CONCERTONE  
Berlant Associates  
CONFLEX  
Metals & Controls Corp.  
CONRAC  
Conrac, Inc.  
CONTACTENE  
Walter L. Schott Co.  
CONTACTRON  
Bracke-Seib X-Ray Co.  
COPYFLEX  
Charles Bruning Co.  
COR-LAC  
Cornish Wire Co.  
COROHM  
Aerovox Corp.  
COROPRENE  
Cornish Wire Co.  
COROPREX  
Cornish Wire Co.  
CORRIB  
Ohmite Mfg. Co.  
CORULITE  
Premax Products Div.  
CORWICO  
Cornish Wire Co.  
COSMOPOLITAN  
Radion Corp.  
COUPLATE  
Centralab Div., Globe-Union, Inc.  
CRCCOHM  
Howard Industries, Inc.  
CRESTRAN  
Crest Transformer Corp.  
CRESTROL  
Crest Transformer Corp.  
CRESTWOOD  
Daystrom Electric Corp.  
CRL  
Centralab Div., Globe-Union, Inc.  
CRU  
National Co.  
CRYSTALEAR  
Brush Electronics Corp.  
CRYSTAL-SEAL  
Gits Molding Corp.  
CRYSTOGRAPH  
Offner Electronics, Inc.  
'C-TEMP' SEALED  
American Radionic Co.  
CUB CORDER  
Ectro, Inc.  
CUNNINGHAM  
Radio Corp. of America  
CUPRON  
Wilbur B. Driver Co.  
CUSTOM 400  
Stromberg-Carlson Co.  
CV  
Oregon Corvex Co.  
CYCLO-TROL  
Cyclotron Specialties Co.  
DAG DISPERSION  
Acheson Colloids Co.  
DALOHM  
Dale Products, Inc.  
DANDEE  
Aerovox Corp.  
DANDUX  
C. R. Daniels, Inc.  
DASON  
J. W. Davis & Co.  
DeARMOND  
Rowe Industries  
DECAFIER  
Decade Instrument Co.  
DECALATOR  
Decade Instrument Co.  
DECA-SWEEP  
Decade Instrument Co.  
DECAVIDER  
Decade Instrument Co.  
DECO  
Dumont Electric Corp.  
DEFIANCE  
All Star Products, Inc.  
DeFOREST  
Radio Corp. of America  
DEL PEC  
Centralab Div., Globe-Union, Inc.  
DELTA MAX  
Arnold Engineering Co.  
DELUXE  
Huppert Co., K. H.  
DEMCO  
Dormitzer Electric & Mfg. Co.

DEOXIDINE  
American Chemical Co.  
DESCO  
Dietz Design & Mfg. Co.  
DETECT-A-FIRE  
Fenwal, Inc.  
DETERMOHM  
Ohmite Mfg. Co.  
DIACONE  
Altec Lansing Corp.  
DIAGNOMETER  
Supreme, Inc.  
DIAGNOSCOPE  
Supreme, Inc.  
DIALCO  
Dialight Corp.  
DIAMATROL  
Standard Electronic Research Corp.  
'DIAMOND H'  
Hart Mfg. Co.  
DIAMOND "K"  
Kenyon Transformer Co.  
DIAMOND WEAVE  
F. W. Sickles Div. Telex, Inc.  
DIAPHLEX  
Cook Electric  
DIATHERM  
American Diathermy Products Corp.  
DIATRON  
Consolidated Eng'g Corp.  
DIEFLEX  
Insulation Mfrs. Corp.  
DIFFERENTIAL  
Electro-Voice, Inc.  
DIFFRACTON  
Bracke-Seib X-Ray Co.  
DILECTOID  
Continental-Diamond Fibre Co.  
DIPMASTER  
Lycso Mfg. Co.  
DIRECTRON  
Barry Electronics Corp.  
DISCABINET  
Wallach Associates  
DISCAPS  
Radio Materials Corp.  
DISCOHM  
Ward Leonard Electric  
DISPATCHER  
Shure Bros. Inc.  
DIVCO  
Division Lead Co.  
DIVIDOHM  
Ohmite Mfg. Co.  
DIXIE  
C. F. Cannon Co.  
D-K  
Western Electronic Enterprises  
DOT  
United-Carr Fastener  
DOUGLAS  
British Industries Corp.  
DREADNAUGHT  
P. Wall Mfg. Co.  
DRI-FILM  
General Electric Co., Chemical Dept.  
DUALDRUM  
Gorrell & Gorrell  
DUAL-MATCH  
Mosley Electronics  
DUFELT  
Filters Co.  
DUMITTER  
Allen B. DuMont Labs.  
DUMONITOR  
Allen B. DuMont Labs.  
DUNCO  
Strutlers-Dunn, Inc.  
DUOCARB  
Wilbur B. Driver Co.  
DUO-DIAMOND  
JFD Mfg. Co.  
DUO MOUNT  
South River Metal Prods.  
DUPEX  
Altec Lansing Corp.  
DUPY  
Inet, J. C.  
DURA CLAD  
Joseph Kinney Co.  
DURAFLEX  
Co-operative Industries  
DURAMEG  
Sprague Electric Co.



DURANITE  
Aerovox Corp.  
DURATEX  
Stromberg-Carlson Co.  
DUTCH BRAND  
Van Cleef Bros.  
D-XER  
JFD Mfg. Co.  
DX MITTER  
Babcock Radio Eng. Inc.  
DYKANOL  
Cornell-Dubilier Electric Corp.  
DYNAGRAPH  
Offner Electronics, Inc.  
DYNAMASTER  
Bristol Co.  
DYNAMIC  
Jackson Electrical Instrument Co.  
DYNA-MIKE  
Industrial Electronics  
DYNAPRENE  
Whitney Blake Co.  
DYNASET  
Telex, Inc.  
DYNAURAL  
Hermon Hosmer Scott  
EARSET  
Telex, Inc.

EPCO  
Etched Products Corp.  
EPRIC  
Electrical & Physical Instrument Corp.  
EPUT  
Berkeley Scientific, Div. Beckman Instruments, Inc.  
ERA  
Eng'g Research Assoc.  
ERLA  
Sentinel Radio Corp.  
ERSIN MULTICORE  
British Industries Corp.  
ESCO  
Electric Specialty Co.  
ESNA  
Elastic Stop Nut Corp.  
ETALON  
Alina Corp.  
EV  
Electro-Voice, Inc.  
EVABRITE  
Semon Bache & Co.  
EVA LAST  
Semon Bache & Co.  
EVANOHM  
Wilbur B. Driver Co.  
EVERLOCK  
Thompson-Bremer & Co.  
EXAKTONE  
Electrosonic Specialties  
EXPLAINETTE  
DuKane Corp.  
EXPRESS  
Centralab Div., Globe-Union, Inc.  
EYE WITNESS  
Radio Corp. of America  
E-Z-CODE  
Western Lithograph Co.  
E-Z STRIPPERS  
Ideal Industries, Inc.  
FARNSWORTH  
Capehart-Fernsworth Corp.  
FASTACH  
Centralab Div., Globe-Union, Inc.  
FATHOMETERS  
Raytheon Mfg. Co.  
FAXFILM  
Brush Electronics Corp.  
FAXIMILE  
Hogan Laboratories, Inc.  
FAXPAPER  
Hogan Laboratories, Inc.  
FB-7  
National Co.  
FEATHERLITE  
Brush Electronics Corp.  
FEDERAL EUPHONIC PRECISION  
Federal Sapphire Prods.  
FEL-PRO  
Felt Products Mfg. Co.  
FEMCO  
Farmers Engineering & Mfg. Co.  
FERRAMICS  
General Ceramics & Steatite Corp.  
FERRITE  
Ferroxcube Corp of America  
FIBERGLAS  
Bentley, Harris Mfg. Co.  
FIBRON PLASTIC TAPE  
Irvington Varnish & Insulator Co.  
FIDELITONE  
George K. Culbertson Co.  
FIDELITONE  
Permo, Inc.  
FILMITE  
Sprague Electric Co.  
FILPEL  
Centralab Div., Globe-Union, Inc.  
FILPLATE  
Centralab Div., Globe-Union, Inc.  
FILT-A-COL  
Magnetic Core Corp.  
FILTEROL  
Sprague Electric Co.  
FINCO  
Finney Co.  
FINNFLEX  
T. R. Finn & Co.  
FIREGUARD  
F. H. Smith Mfg. Co.  
FIVER  
Crosley Div., Avco Mfg. Corp.  
FIXED VITROHM  
Ward Leonard Electric Co.  
FLASH  
Phillips Mfg. Co.  
FLATOHM  
Centralab, Div. Globe-Union, Inc.

# BRAND and TRADE NAME INDEX

<b>GIANT SIX</b> Burgess Battery Co.	<b>HI-FI</b> Pentron Corp.	<b>INPUTUNER</b> Allen B. DuMont Labs.	<b>KLIPSCHORN</b> Klipsch & Associates	<b>LONGLIFE</b> Gorrell & Gorrell	<b>MEGA-CHARTS</b> Kay Electric Co.
<b>GIBSILOYS</b> Gibson Electric Co.	<b>HIGH HO OUTPUT</b> Minn. Mining & Mfg. Co.	<b>INSPECTRAY</b> Bracke-Seib X-Ray Co.	<b>KNIGHT</b> Allied Radio Corp.	<b>LONG LIFE</b> Permo, Inc.	<b>MEGACYCLE METER</b> Measurements Corp.
<b>GITS-NIFE</b> Gits Molding Corp.	<b>HIGH-KAPS</b> Centralab, Div. Globe Union, Inc.	<b>INSTANSOLDER</b> Cole Radio Works	<b>KODAK</b> Eastman Kodak Co.	<b>LOS GATOS BRAND</b> Lewis & Kaufman, Ltd.	<b>MEGALIGNER</b> Kay Electric Co.
<b>GLAMOR-TONE</b> Crosley Div., Avco Mfg.	<b>HIGH OUTPUT</b> Minn. Mining & Mfg. Co.	<b>INSULCON</b> Stupakoff Ceramic & Mfg.	<b>KOOLOHM</b> Sprague Electric Co.	<b>LOVINSTRUMENTS</b> Lovins Engineering Co.	<b>MEGALIZER</b> Kay Electric Co.
<b>GLASER-STEERS</b> Glaser-Steers Corp.	<b>HI-K CERAMICON</b> Erie Resistor Corp.	<b>INSUL-FILM</b> Electrofilm Corp.	<b>KOROHM</b> Wilcor Div., Aerovox Co.	<b>LUBE-LOK</b> Electrofilm Corp.	<b>MEGA-MATCH</b> Kay Electric Co.
<b>GLASHOM</b> Clarostat Mfg. Co.	<b>HILO</b> Wilbur B. Driver Co.	<b>INSULITE</b> Extruders, Inc.	<b>KROME-KOAT</b> General Cement Mfg. Co.	<b>LUBRI-BOND</b> Electrofilm Corp.	<b>MEGA-NODE</b> Kay Electric Co.
<b>GLASSEAL</b> Pyramid Electric Co.	<b>HINDVIEW</b> Whitehead Stamping Co.	<b>INSUROK</b> Richardson Co.	<b>CRYSTAL KOAT</b> General Cement Mfg. Co.	<b>LUBRI-LO</b> Permo, Inc.	<b>MEGA-PIX</b> Kay Electric Co.
<b>GLENITE</b> Gullton Mfg. Corp.	<b>HI-Q</b> Aerovox Corp. Hi-Q Div., Aerovox Corp.	<b>INTELEX</b> Federal Telephone & Radio Corp.	<b>K-TRAN</b> Automatic Mfg. Corp.	<b>LULLABY</b> Mitchell Mfg. Co.	<b>MEGA-PULSER</b> Kay Electric Co.
<b>GLIDER</b> Shure Bros., Inc.	<b>HIS MASTER'S VOICE</b> Radio Corp. of America	<b>INTELIN</b> Federal Telephone & Radio Corp.	<b>KUM-KLEEN</b> Avery Adhesive Label	<b>LUMETRON</b> Photovolt Corp.	<b>MEGA-SWEEP</b> Kay Electric Co.
<b>GLOBALAR</b> Carborundum Co.	<b>HI-TEMP</b> Cons. Wire & Assoc.	<b>INTELINK</b> Federal Telephone & Radio Corp.	<b>KWIK KLIP</b> South River Metal Products	<b>LUMINAR</b> Heiland Research Corp.	<b>MEG-MARKER</b> Kay Electric Co.
<b>GLOBE TROTTER</b> Radio Corp. of America	<b>HI-TEMP</b> K. H. Huppert Co.	<b>INTERCO</b> Intercontinental Industries, Inc.	<b>LABCASE</b> Berkshire Laboratories	<b>LUMINETTE</b> Heiland Research Corp.	<b>MEG-O-MAX</b> Sprague Electric Co.
<b>GLO-CRAFT</b> Switzer Bros., Inc.	<b>HITCO</b> H. I. Thompson Co.	<b>INTERLOCK</b> Harvey Hubbell, Inc.	<b>LABCHECK</b> Berkshire Laboratories	<b>LUSTERIZED</b> American Electric Cable	<b>MELCORE</b> Melpar, Inc.
<b>GLO-STIX</b> Topflight Tape Co.	<b>HI-VO KAPS</b> Centralab, Div. Globe-Union, Inc.	<b>INTERLOCKING</b> Federal Telephone & Radio Corp.	<b>LABMARKER</b> Berkshire Laboratories	<b>LUSTERLAC</b> American Electric Cable	<b>MELLAPHONE</b> Electronic Rectifier
<b>GLO-TENNA</b> National Electronics	<b>HOISTPHONE</b> Mine Safety Appliances Co.	<b>IPC</b> Western Electronic Enterprises	<b>LABOHM</b> Berkshire Laboratories	<b>LUXOLENE GREEN</b> DeLux Coils, Inc.	<b>MELODISC</b> Howe Recording Products
<b>GOLD CUP SPEAKERS</b> Carbonneau Industries	<b>HOKE-PHOENIX</b> Hoke, Inc.	<b>IRC</b> Int'l Resistance Co.	<b>LABORATORY STANDARDS</b> Measurements Corp.	<b>LYNN LIGHTING</b> Vaco Products Co.	<b>MEL-O-TUNE</b> Automatic Radio Mfg.
<b>GOLDEN THROAT</b> Radio Corp. of America	<b>HORNET</b> New York Transformer Co.	<b>IRISH</b> Orradio Industries	<b>LABSTROBE</b> Berkshire Laboratories	<b>LYT-L TUNER</b> Lytle Engineering & Mfg.	<b>MELPRO</b> Mercury Electro Prods.
<b>GOLD-O-MATIC</b> Luxor Lighting Products	<b>HOT-ROD</b> National Electronics	<b>IRV-O-VOLT</b> Irvington Varnish & Insulator Co.	<b>LABUNIT</b> Gates & Co., Geo. W.	<b>MACADIE</b> British Industries Corp.	<b>MEMOTAPE</b> Electrosonic Specialties
<b>GOODSELL</b> Minnesota Electronics	<b>HOWDY DOODY</b> Shura-Tone Products	<b>ISOMADE</b> M B Mfg. Co.	<b>LABVOLT</b> Berkshire Laboratories	<b>MAGIC CIRCLE REMOTE CONTROL</b> A.R.F. Products, Inc.	<b>MERC-O-SEAL</b> Mercury Contacts, Inc.
<b>GORDOS</b> Mark Electronics, Inc.	<b>HQ</b> Hammarlund Mfg. Co.	<b>ISOMICA</b> Mica Insulator Co.	<b>LA-CO FLUKES</b> Lake Chemical Co.	<b>MAGIC EYE</b> Radio Corp. of America	<b>MERCURY</b> Electro-Voice, Inc.
<b>GPL</b> General Precision Labs.	<b>HRO</b> National Co.	<b>ISATRON</b> Consolidated Eng'g	<b>LAMICOID</b> Mico Insulator Co.	<b>MAGIC MONITOR</b> Radio Corp. of America	<b>MERIT</b> Emmott Machine & Mfg.
<b>GR</b> General Radio Co.	<b>HUBBELLOCK</b> Harvey Hubbell, Inc.	<b>ISOTRAN</b> Nuclear Instrument & Chemical Corp.	<b>LANSING</b> Altec Lansing Corp.	<b>MAGIC PULLEY</b> Allen B. DuMont Labs.	<b>MERITUNE</b> Polytech Devices, Inc.
<b>GRACOIL</b> Kramer Transformer Co.	<b>HUDCO</b> Hudson Wire Co.	<b>JACO</b> Jarrell-Ash Co.	<b>LAQUER STIK</b> Lake Chemical Co.	<b>MAGMOTOR</b> Carter Motor	<b>MERRY-MAKER</b> Crosley Div., Avco Mfg.
<b>GRAFOIL</b> Brush Electronics Corp.	<b>HUDSON</b> Oxford Electric Corp.	<b>JAVABOND</b> Javex	<b>LB</b> Leiman Bros. Inc.	<b>MAGNABOND</b> Fischer & Porter Co.	<b>METAL-CLAD</b> Burgess Battery Co.
<b>GRANODINE</b> American Chemical Co.	<b>HUG-A-PLUG</b> Moore Tool Works	<b>JAY-BEE-TEE</b> J-B-T Instruments, Inc.	<b>LC CHECKER</b> Aerovox Corp.	<b>MAGNAGLO</b> Magnaflux Corp.	<b>METALLIZED</b> International Resistance Co.
<b>GRAPHALLOY</b> Graphite Metallizing	<b>HUG-A-PLUG</b> Page-Fogwell Corp.	<b>JECO</b> Jarvis Electronics Corp.	<b>LEAK</b> British Industries Corp.	<b>MAGNATEST</b> Magnaflux Corp.	<b>METALSEAL CRYSTALS</b> Brush Electronics Corp.
<b>GRAVERLITE</b> Natural Lighting Corp.	<b>HUMDINGER</b> Clarostat Mfg. Co.	<b>JEFERS</b> Speer Carbon Co.	<b>LECTROFILTER</b> Pittsburgh Electrodyer	<b>MAGNEROTOR</b> Ruckelshaus Labs. Inc.	<b>METAMETER</b> Bristol Co.
<b>GREENBAND</b> Todd-Tran Corp.	<b>HUMIDGRAPH</b> Bristol Co.	<b>JEFFERSON</b> Atlantic Electronics Corp.	<b>LECTROFORMED</b> Bart Laboratories	<b>MAGNE-STRIPE</b> Reeves Soundcraft Corp.	<b>META PHONE</b> Bristol Co.
<b>GREEN BULLET</b> Shure Bros., Inc.	<b>HUMIDITITE</b> Sangamo Electric Co.	<b>JEFFERSON-TRAVIS</b> Emerson Radio & Phon.	<b>LEESONA</b> Universal Winding Co.	<b>MAGNETIC DECISION ELEMENT</b> Minn. Electronics Corp.	<b>META VANE</b> Bristol Co.
<b>GREENOHM</b> Clarostat Mfg. Co.	<b>HURLETRON</b> Electric Eye Equipment	<b>JETENNA</b> JFD Mfg. Co.	<b>LEDEX</b> G. H. Leland, Inc.	<b>MAGNETONE</b> Brush Electronics Corp.	<b>METEX</b> Metal Textile Corp.
<b>GRIP TIP</b> Jiffy Clip Mfg. Co.	<b>HUSHATONE</b> Brush Electronics Corp.	<b>JETLINE SPEAKERS</b> Carbonneau Industries	<b>L.E.M.</b> JFD Mfg. Co.	<b>MAGNETRONIC</b> Teleregister Corp.	<b>MET-L-FLEX</b> Robinson Aviation, Inc.
<b>GUDELACE</b> Gudebrod Bros. Silk Co.	<b>HYFLUX</b> Indiana Steel Products	<b>JK PRODUCTS</b> James Knights Co.	<b>LEMCO</b> Lytle Eng'g & Mfg.	<b>MAGNETONIC</b> Teleregister Corp.	<b>METROPOLITAN</b> Radion Corp.
<b>GUEST TELEVISION</b> Industrial Television	<b>HYPASS</b> Sprague Electric Co.	<b>HOWARD B. JONES</b> Cinch Mfg. Co.	<b>LERO</b> Lynn Electronic Research	<b>MAGNETRONIC</b> Teleregister Corp.	<b>MICABOND</b> Continental-Diamond Fibre Co.
<b>HABIRSHAW</b> Phelps Dodge Coffee Products	<b>HYPERSONIC</b> Brush Electronics Corp.	<b>J-TRAN</b> Automatic Mfg. Corp.	<b>LECTROFORMED</b> Bart Laboratories	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICAFIL</b> Cosa Corp.
<b>HALLOWELL</b> Standard Pressed Steel	<b>HYVOL</b> Aerovox Corp.	<b>JUMBO LIGHTNING ARRESTER</b> JFD Mfg. Co.	<b>LESCO</b> Hoffman Radio Corp.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICANITE</b> Mica Insulator Co.
<b>HALOLIGHT</b> Sylvania Electric Prods.	<b>IBM</b> Int'l Business Machines	<b>J-W SENTINEL</b> Johnson-Williams, Ltd.	<b>LEVELIMETER</b> Fischer & Porter Co.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICO</b> Mica Insulator Co.
<b>HANDIE-TALKIE</b> Motorola, Inc.	<b>ICA</b> Insuline Corp. of America	<b>KALWOOD</b> Keller Products, Inc.	<b>LFE</b> Lab. for Electronics, Inc.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICRO</b> New Hampshire Ball Bearings Inc.
<b>HARMIC</b> P. Wall Mfg. Co.	<b>ICONIC</b> Altec Lansing Corp.	<b>KANTLINK</b> American Bolt & Nut Fastener Co.	<b>LIECO</b> Lerner Instrument & Electronics	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROCORE</b> Magnetic Metals Co.
<b>HAWLITE</b> Hawley Products Co.	<b>IDA</b> Computer Corp. of America	<b>KAPOK-UNISORB</b> Filters Co.	<b>LIFE-TONE</b> Allen B. Dumont Labs.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROACT</b> Bristol Co.
<b>HAYGREN</b> Haydon Products Corp.	<b>IDEA</b> Industrial Development Eng'g Assoc.	<b>KARADIO</b> Eckstein Radio & Television Co.	<b>LIGHT GUARD</b> Electric Storage Battery	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICRODIAL</b> George W. Borg Corp., Borg Equipment Div.
<b>HAYS-PENN</b> Penn Industrial Instrument Corp.	<b>IEI</b> Industrial Electronics	<b>KARDFON</b> Premier Instrument Corp.	<b>LIGHTWATCHMAN</b> Ripley Co.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICRODOT</b> Felts Corp.
<b>HAZEGAGE</b> Ess Instrument Co.	<b>IEPC</b> Industrial Eng'g Prods.	<b>KARROPAK</b> Felt Products Mfg. Co.	<b>LINEATOR</b> Airborne Accessories	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROFONE</b> Joseph Dixon Crucible Co.
<b>H &amp; D</b> Hinde & Dauch	<b>ILLINI-HYCAP</b> Illinois Condenser Co.	<b>KAY-LAB</b> Kalbfell Laboratories	<b>LINE-O-LIFE</b> Carter Motor	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROLITE</b> Glass Fibers, Inc.
<b>HEARD EVERYWHERE</b> Lowell Mfg. Co.	<b>IMP</b> Carter Parts Co.	<b>K-CAP</b> Automatic Mfg. Corp.	<b>LIQUI-TAPE</b> Ramsey Mfg. Corp.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROLYTIC</b> Micamold Radio Corp.
<b>HECO</b> Harmon Electronics Co.	<b>INDALLOY</b> Indiana Steel Products	<b>KEL-F</b> M. W. Kellogg Co.	<b>LITER MASTER</b> Art Specialty Co.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICRO-NAMIC</b> Micro Balancing
<b>HECO</b> Hopkins Eng'g Co.	<b>INDUCTRONICS</b> Edwin I. Guthman & Co.	<b>KENCO</b> Kenwood Engineering Co.	<b>LITTEL-PLUG</b> Switchcraft, Inc.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICRO-PULSER</b> Kay Electric Co.
<b>HELISCOPE</b> Crosley Div., Avco Mfg., Corp.	<b>INDUSTRAVOX</b> Electronic Eng. Co.	<b>KILO-SWEEP</b> Kay Electric Co.	<b>LITTLE DEVIL</b> Ohmite Mfg. Co.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROSENOR</b> Vitro Corp. of America
<b>HELIX</b> Carl H. Briggs Co.	<b>IND-X-MATIC</b> Brush Electronics Corp.	<b>KINE-LITE</b> Vidaire Electronics Mfg.	<b>LITTLE GIANT</b> JFD Mfg. Co.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROTHERM</b> Raytheon Mfg. Co.
<b>HERCULES</b> Acromark Co.		<b>KINE-TEST</b> Vidaire Electronics Mfg.	<b>LITTLE NIPPER</b> Radio Corp. of America	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROSPECT</b> Permo, Inc.
<b>HERCULES</b> Shure Bros., Inc.		<b>KLIEGLIGHTS</b> Kliegl Bros.	<b>LITTLE SIX</b> Burgess Battery Co.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROTORQUE</b> G. M. Giannini & Co.
<b>HERMICO</b> Hermetic Seal Products			<b>LITTLE WONDER</b> Philmore Mfg. Co.	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICRO-VOX</b> Mercury Electro-Products Inc.
<b>HERMOFLEX</b> Kearfott Co.			<b>LOGO</b> Westinghouse Electric	<b>MAGNETONIC</b> Teleregister Corp.	<b>MICROTRONIC</b> Fischer & Porter Co.
<b>HFS</b> National Co.				<b>MAGNETONIC</b> Teleregister Corp.	<b>MIDGET</b> Airpax Products Co.
<b>HI</b> Halub Industries, Inc.				<b>MAGNETONIC</b> Teleregister Corp.	<b>MIDGET</b> Sprague Electric Co.
<b>HI-CAPS</b> Centralab, Div. Globe-Union, Inc.				<b>MAGNETONIC</b> Teleregister Corp.	<b>MIGHTYMIDGET</b> K. H. Huppert Co.
<b>HIDE-AWAY</b> JFD Mfg. Co.				<b>MAGNETONIC</b> Teleregister Corp.	
<b>HI-FARAD</b> Aerovox Corp.				<b>MAGNETONIC</b> Teleregister Corp.	

# BRAND and TRADE NAME INDEX

- MIJAKON**  
John E. Fast & Co.
- MIKSUB**  
John E. Fast & Co.
- MINE-A-PHONE**  
Stromberg-Carlson Co.
- MINEPHONE**  
Mine Safety Appliances Co.
- MINIGANG**  
G. M. Giannini & Co.
- MIN-KAPS**  
Centralab, Div. Globe-Union, Inc.
- MINI-LINE**  
Bailey Meter Co.
- MINISEL**  
Deltronc Devices, Inc.
- MINI-SHIELD**  
Staver Co.
- MINISPOT**  
O'Neil-Irwin Mfg. Co.
- MINI-SPRING**  
Staver Co.
- MINISTREL**  
Crosley Div., Avco Mfg.
- MINNI-NOISE**  
Felts Corp.
- MINUTE TO MONTH**  
Gorrell & Gorrell
- MIRRAGRAPH**  
Techno Instrument Co.
- MIRRASCOPE**  
Techno Instrument Co.
- MIRRORTONE**  
Electrosonic Specialties
- MISSION BELL**  
Hoffman Radio Corp.
- MITCHELL-HUGHES**  
Hoffman Radio Corp.
- MOBILE-MIKES**  
Electro-Voice, Inc.
- MODIFIED HILO**  
Wilbur B. Driver Co.
- MOLDITE**  
National Moldite Co.
- MOLDTITE**  
United Condenser Corp.
- MOLD-X**  
American Radionic Co.
- MONARCH**  
Automatic Radio Mfg.
- MONITORADIO**  
Radio Apparatus Corp.
- MONOBLOC**  
Winchester Electronics
- MONDRUM**  
Gorrell & Gorrell
- MONOPLEX**  
Shure Bros. Inc.
- MONOSET**  
Telex, Inc.
- MONOWATT**  
General Electric Co.
- MORBOARD**  
Howard J. Moore Co.
- MORBOND**  
Howard J. Moore Co.
- MORCO**  
Howard J. Moore Co.
- MORCOLENE**  
Howard J. Moore Co.
- MORCON**  
Howard J. Moore Co.
- MORCOTATE**  
Howard J. Moore Co.
- MORCOWEDGE**  
Howard J. Moore Co.
- MORFLEX**  
Howard J. Moore Co.
- MORFLON**  
Howard J. Moore Co.
- MORPRENE**  
Howard J. Moore Co.
- MORTEX**  
Howard J. Moore Co.
- MORVARN**  
Howard J. Moore Co.
- MOTO-MAG**  
Keystone Products Co.
- MOVIE-CLEAR**  
Sylvania Electric Prods.
- MOVIE-MITE**  
Calvin Co.
- MOVIE SOUND 8**  
Calvin Co.
- MULTIBOOSTER**  
Industrial Television
- MULTICORE**  
British Industries Corp.
- MULTICOUPLER ANTENNA SYSTEM**  
Amy, Aceves & King, Inc.
- MULTI-GATE**  
Hammarlund Mfg. Co.
- MULTI-MASTER**  
Precision Apparatus Co.
- MULTIPLE-SHOT**  
Gits Molding Corp.
- MULTI-SPEED**  
Pentron Corp.
- MULTI-SWAGE PRODUCTS**  
Bead Chain Mfg. Co.
- MULTITAPE**  
Rawdon Smith Associates
- MULTIVOLT**  
Ohmite Mfg. Co.
- MU-NET**  
F. W. Sickles Div.
- MUSICPHONE**  
Macon Electronics
- MUSICTAPE**  
Macon Electronics
- MYKAPLAST**  
United Condenser Corp.
- MYKE-A-TROL**  
Industrial Electronics
- MYKROY**  
Electronic Mechanics
- NA-ALD**  
Alden Products Co.
- NABTRON**  
Sorenson & Co.
- NARCO**  
National Aeronautical
- NARCO OMNIGATOR**  
National Aeronautical
- NARCO OMNIBOMER**  
National Aeronautical
- NARCO REPORTER**  
National Aeronautical
- NARCO SUPERHOMER**  
National Aeronautical
- NARCO VHF**  
National Aeronautical
- NAROHM**  
Ohmite Mfg. Co.
- NATCO**  
National Co.
- NEMCO-MATIC**  
National Electronics Mfg.
- NE-O-LITE**  
General Cement Mfg. Co.
- NEPCO**  
National Electric Prods.
- NEVAMAR**  
National Plastic Prods.
- NIBBLEX**  
Nord International Corp.
- NIFER**  
Metals & Controls Corp.
- NILSTAIN**  
Wilbur B. Driver Co.
- NIPPER**  
Radio Corp. of America
- NI-SPANC**  
Wilson Co., H.A.
- NOBLELOY**  
Continental Carbon Co.
- NO BRUSH**  
Georator Corp.
- NOFLAME-COR**  
Cornish Wire Co.
- NOISERASER**  
Minnesota Electronics
- NORELCO**  
North American Philips
- NORPLAC**  
Norwestern Plastics
- NUMBERGRAPHS**  
Metalcraft, Inc.
- NUT**  
JFD Mfg. Co.
- OAKWOOD**  
Osborn Products
- OCTAN**  
Ogden Coil & Transformer
- OFFIFONE**  
Inter-Communications
- OHIOHM**  
Ohio Carbon Co.
- OHMOID**  
Wilmington Fibre Spec.
- OHMSPUN**  
States Co.
- OILDAG**  
Acheson Colloids Co.
- OLSON**  
Edwin A. Lipps
- OPERADIO**  
DuKane Corp.
- ORTHOGONAL TORQUE-DRIVE**  
Electro-Voice, Inc.
- ORTSOSIL**  
Thomas & Skinner
- OSCILLATRON**  
Vectron, Inc.
- OSCILLOPROBE**  
Linear Equipment Labs.
- OSCIL-O-PEN**  
Lux Industries, Inc.
- OVALTUBE**  
Plastoid Corp.
- OZARK**  
Lowell Mfg. Co.
- PACITOR**  
Simmonds Aerocessories
- PACITRON**  
Simmonds Aerocessories
- PACKMASTER**  
Radio Specialty Mfg.
- PALMGREN**  
Chicago Tool & Eng'g.
- PAINT-SHIELD**  
Ramsell Mfg. Corp.
- PAKAP**  
Audio Products Corp.
- PAK-EXCHANGES**  
North Electric Mfg. Co.
- PALCO**  
Worcester Pressed Aluminum Corp.
- PANCOUSTIC**  
U. S. Recording Co.
- PANADAPTOR**  
Panoramic Radio Prods.
- PANALYZOR**  
Panoramic Radio Prods.
- PANATROPE**  
Brunswick Radio Div.
- PANDUX**  
Pacific Transducer Corp.
- PANELITE**  
Allied International
- PAN-I-LITE**  
Alden Products Co.
- PANORAMA**  
JFD Mfg. Co.
- PANORAMIC VISION**  
Stromberg-Carlson Co.
- PANORAMOSCOPE**  
Panoramic Radio Products
- PARACOID**  
Parisian Novelty Co.
- PARA-FLUX**  
Radio Music Corp.
- PARISANOID**  
Parisian Novelty Co.
- PARRALLEAD**  
Chester Cable Corp.
- PARTEK**  
Magnaflux Corp.
- PATRICIAN**  
Electro-Voice, Inc.
- PEC**  
Centralab, Div. Globe-Union, Inc.
- PECO**  
Paragon Electric Co.
- PEDASINE**  
R. A. Fischer & Co.
- PEERAGE**  
Electro-Voice, Inc.
- PEERLESS**  
Aitex Lansing Corp.
- PEE WEE**  
Mueller Electric Co.
- PENATRON**  
Precision Electronics
- PENDET**  
Centralab, Div. Globe-Union, Inc.
- PEPCO**  
Aitex Lansing Corp.
- PERECO**  
Pereny Equipment Co.
- PER-KEY**  
Pioneer Electric & Research Corp.
- PERMACEL**  
Industrial Tape Corp.
- PERMALLOY**  
Arnold Engineering Co.
- PERMASEAL**  
Sprague Electric Co.
- PERMIUM**  
Permo, Inc.
- PERMOLITE**  
Permo, Inc.
- PERMO-SWITCH**  
Centralab, Div. Globe-Union, Inc.
- PEROHM**  
Yonkers Industries, Inc.
- PFAN-TONE**  
Pfanstiehl Chemical Co.
- PFAN-WOOD**  
Pfanstiehl Chemical Co.
- PHAZOR**  
Industrial Test Equip.
- PHENOLITE**  
National Vulcanized Fibre
- PHONCORD**  
Packard-Bell Co.
- PHONO-DOODLE**  
Shara-Tone Products
- PHONOSTROBE**  
Berkshire Labs.
- PHOTO-EYE**  
Heiland Research Corp.
- PHOTO-LITES**  
O'Neil-Irwin Mfg. Co.
- PHOTOPEDIA**  
United Catalog Pub.
- PHOTOSPHORE**  
Iq industries
- PHOTOTRON**  
Thomas Electronics, Inc.
- PHOTOTRONIC**  
Western Electrical Instrument Corp.
- PIC**  
Polyphase Instrument Co.
- PICK-A-BACK**  
Airpax Products Co.
- PICK-A-SHAFT**  
Clarostat Mfg. Co.
- PIC SYNC**  
Fairchild Recording Equip.
- PILOTROL**  
Bailey Meter Co.
- PILOTUNER**  
Pilot Radio Corp.
- PINHEAD**  
Sprague Electric Co.
- PIPETITE-STIK**  
Lake Chemical Co.
- PISTOGRIP**  
P. Wall Mfg. Co.
- PITCO**  
Pittsburgh Coil Co.
- PIV**  
Link-Belt Co.
- PLAQOHM**  
Ward Leonard Electric.
- PLASTIC EYE**  
Gits Molding Corp.
- PLASTICON**  
Condenser Products Co.
- PLASTICORD**  
Chester Cable Corp.
- PLASTICOTE**  
Chester Cable Corp.
- PLASTIMOLD**  
Emerson Radio & Phon.
- PLASTISEL**  
Electronic Devices, Inc.
- PLASTOK**  
Richardson Co.
- PLAYBOY**  
Crosley Div., Avco Mfg. Corp.
- PLAYMASTER**  
Market Electric Prods.
- PLAY-TIME**  
Crosley Div., Avco Mfg. Corp.
- PLEXICON**  
Erie Resistor Corp.
- PLUG-IN**  
JFD Mfg. Co.
- PLUG-STAT**  
Control Products, Inc.
- PLUMBER KRAK-STIK**  
Lake Chemical Co.
- PM**  
Duncan & Bailey
- PN CRYSTAL**  
Bush Electronics Corp.
- POCKETSCOPE**  
Waterman Products Co.
- POLAROID**  
Polarizing Instrument
- POLICALARM**  
Radio Apparatus Corp.
- POLICARB**  
Wilbur B. Driver Co.
- POLYPENCO**  
Polymer Corp.
- POLYRANGER**  
Sensitive Research Instrument Corp.
- PORT-A-PHONE**  
Feiler Eng'g & Mfg. Co.
- PORT-O-REEL**  
Industrial Electrical
- PORTOLA**  
Bell Sound Systems
- PORTRONIC**  
Photographic Products
- POSTLITES**  
Drake Mfg. Co.
- POWER REEL**  
Industrial Electrical
- POWERSTAT**  
Superior Electric Co.
- POWERSTREAK**  
American Electric Cable
- POWR-DRIV**  
Lowell Metal Prods.
- POWR-RIB**  
Ohmite Mfg. Co.
- PRECISION-BUILT**  
Albert Pratt
- PREP**  
Symphonic Radio & Electronic Corp.
- PRESS-FIT**  
Sealectro Corp.
- PRESS-I-CELL**  
Fischer & Porter Co.
- PRESSMASTER**  
Heiland Research Corp.
- PRES-SURE**  
Buchanan Electrical Products Corp.
- PREST-TITE CONNECTORS**  
Wind Turbine Co.
- PRESTO**  
G. D. Gustafson Mfg. Co.
- PRESTO-SPLICER**  
Prestoseal Mfg. Corp.
- PRINT-STIX**  
Topflight Tape Co.
- PRIVATE EYE MONITORS**  
Television Utilities
- PRMCO**  
Ports Mfg. Co.
- PROBOGRAPH**  
Industrial Scientific
- PRODAG**  
Acheson Colloids Co.
- PRODELIN**  
Product Development Co.
- PRODELIN**  
John D. Triltsch Co.
- PRODUCTIMETERS**  
Durant Mfg. Co.
- PROFITMAKER**  
Television Spec. Co.
- PROKAR**  
Sprague Electric Co.
- PROTECTRON**  
Brinnel Co.
- PULSESCOPE**  
Waterman Products Co.
- PULTEC**  
Pulse Techniques, Inc.
- PURIFIL**  
Electric Eye Equipment
- PYREX**  
Corning Glass Works
- PYRO**  
Prvometer Instrument
- PYROHM JR.**  
Aerovox Corp.
- PYROMARK**  
Tempil Corp.
- PYROMASTER**  
Bristol Co.
- PYROMATIC**  
Rockhar Corp.
- PYROTROL**  
Bristol Co.
- PYROUAC**  
Eitel-McCullough, Inc.
- PROVISOR**  
Bristol Co.
- Q LACE**  
Edwin I. Guthman & Co.
- Q-MAX**  
Communication Products
- QUICK-CALL**  
Motorola Inc.
- QUICK-LABEL**  
W. H. Brady Co.
- QUICK-MASK**  
W. H. Brady Co.
- QUICK-RIG**  
JFD Mfg. Co.
- QUICK-SIGN**  
W. H. Brady Co.
- QUINORGO**  
Johns-Manville
- QUINTENNA**  
Tannalab
- QUINTERRA**  
Johns-Manville
- RADA**  
Video Corp. of America
- RAD-A-COR**  
Magnetic Core Corp.
- RADAMETER**  
Raytheon Mfg. Co.
- RADA-PULSER**  
Kay Electric Co.
- RADARANGE**  
Raytheon Mfg. Co.
- RADAR-TENNA**  
Brach Mfg. Corp.
- RADA-SWEEP**  
Kay Electric Co.
- RADAX**  
Electro-Voice, Inc.
- RADIAC**  
Arnold Ceramics, Inc.
- RADIMAX**  
Nuclear Research & Devel. Co.
- RADIOCARB**  
Wilbur B. Driver
- RADIOCRAFT**  
Technicraft Supply Co.
- RADIODYNE**  
Western Coil & Electrical Co.
- RADIOHM**  
Centralab, Div. Globe-Union, Inc.
- RADIOLA**  
Radio Corp. of America
- RADIOSPHERE**  
Iq industries
- RADIOTRON**  
Radio Corp. of America
- RADOMES**  
United States Plywood
- RAEL**  
Radio TV Products Corp.
- RAK-LAB**  
Davies Labs., Inc.
- RAK SCOPE**  
Waterman Products Co.
- RANGE FINDER**  
Burgess Battery Co.
- RANGER**  
Electronic Spec. Co.
- RANGER**  
JFD Mfg. Co.
- RANGER**  
Shure Bros.
- RANGERCORD**  
Rangertone, Inc.
- RAPTAR**  
Wollensak Optical Co.
- RANGEREITE**  
Rangertone, Inc.
- RATOTRONIC**  
Fisher & Porter Co.
- RAXAX SUPER-EIGHT**  
Electro-Voice, Inc.
- RAYDIST**  
Hastings Instrument Co.
- RAYMASTER**  
George W. Gates & Co.
- RAYOFLEX**  
Walter L. Schott Co.
- RAYONIC**  
Waterman Products Co.
- RCA VICTOR**  
Radio Corp. of America
- REAC**  
Reeves Instrument Corp.
- REACTRON**  
United Condenser Corp.
- REBEL**  
Klipsch & Associates
- RE-CIRK-IT**  
Heinemann Electric Co.
- RECORD LIFE**  
Minnesota Electronics Corp.
- RECTICHARGER**  
Raytheon Mfg. Co.
- RECTIFIER-G-ENGINEERS**  
W. Green Electric Co.
- RECTIFIER**  
Raytheon Mfg. Co.
- RECTISEL**  
Electronic Devices, Inc.
- RECORALOY**  
Wilbur B. Driver Co.
- RECORDENE**  
Walter L. Schott Co.
- RE-CORD-O-FONE**  
Bell Sound Systems, Inc.
- RECTODYNE**  
McColpin-Christie Corp.
- RED BALL**  
Columbia Resistors, Inc.
- RED FLASH**  
Enthoven Solders, Ltd.
- RED SEAL**  
Radio Corp. of America
- REDUX**  
Ciba Co.
- REFLECTO-STIX**  
Topflight Tape Co.
- REFLEX**  
P. A. Sturtevant Co.
- REGENCY**  
Idea, Inc.
- REGENCY**  
Electro-Voice, Inc.
- REGGO**  
Regulator Eng'g & Devel.
- REGOHM**  
Electric Regulator Corp.
- REJAFIX**  
Popper & Sons.
- RELIATRON**  
Westinghouse Electric.
- REMINGTON**  
Automatic Radio Mfg.
- REMTRON**  
Remington Rand, Inc.
- REPEATER RECORDS**  
Talking Devices Co.
- RESIN-FIVE**  
Kester Solder Co.
- RESOLVER**  
Kefay Mfg. Corp.
- RESERVISOR**  
Teleregister Corp.
- REVERBERATOR**  
Electrosonic Specialties





# BRAND and TRADE NAME INDEX

- REX** Shure Brothers, Inc.  
**RIFLEX** Ward Leonard Electric.  
**RICHELAIN** Richardson Co.  
**RICHMOND** Lowell Mfg. Co.  
**RICO** Reeves Instrument Corp.  
**RITIOHM** Ohmite Mfg. Co.  
**RODAR-ALLOY** Wilbur B. Driver  
**ROHCO** Hull & Co., R.O.  
**ROLLCO** Rollins Corp.  
**ROLLPIN** Elastic Stop Nut Corp.  
**ROOF-THRU** Mosley Electronics  
**ROSSLYN METAL** Joseph Kinney Co.  
**ROTALYZER** Kay Electric Co.  
**ROTOMATIC** E. F. Johnson Co.  
**ROTORAC** Airborne Accessories  
**ROTORETTE** Airborne Accessories  
**ROTO STEPPER** G. M. Giannini & Co.  
**ROTRAN** Cons. Wire & Assoc. Co.  
**ROYAL** Electro-Voice, Inc.  
**ROYAL** Permoflux Corp.  
**RPC** Resistance Products Co.  
**RPL** Robinson Recording Lab.  
**RPM** iq industries  
**RTMA 141** Coil Eng'g & Mfg. Co.  
**RUB-EROK** Richardson Co.  
**RUBYFLUID** Ruby Chemical Co.  
**RUF-KOAT** General Cement Mfg. Co.  
**SAF-T-GLO** C. C. Galbraith & Son  
**SAFE TV GUARD** JFD Mfg. Co.  
**SALBRIC** American Solder & Flux  
**SALESCASTER** Electronic Specialties Co.  
**SAND SCOTT** Holub Industries, Inc.  
**SANGAMO** Sangamo Electric Co.  
**SCHMATCO** Stone City Machine & Co.  
**SCINFLEX** Scintilla Magneto Div., Bendix Aviation Corp.  
**SCINTILLATOR** Precision Radiation Instruments  
**SCINTIMETER** R-C Scientific Instrument  
**SCOA** Screw Corp. of America  
**SCOTCH** Minn. Mining & Mfg.  
**SCOTCHCAST** Minn. Mining & Mfg.  
**SCOTCHFIL** Minn. Mining & Mfg.  
**SCOTCHKOTE** Minn. Mining & Mfg.  
**SCOTCHLOK** Minn. Mining & Mfg.  
**SCOTTIE** Remler Co.  
**SCOUT** C. F. Cannon Co.  
**SCRIBE** Permoflux Corp.  
**SCRIPT AID** Video Corp. of America  
**SEALED-CAST** Carad Corp.  
**SEALNUT** Radio Frequency Labs.  
**SECO** Superior Electric Co.  
**SECTOR** Jensen Mfg. Co.  
**SELECT-O-MATIC** J. P. Seeburg Corp.  
**SELECT-O-VISION** Comm. Measurements  
**SELECTUNER** Allen B. DuMont Labs.  
**SELEATOR** Jackson Electrical Instrument Co.
- SELFUBE** Keystone Carbon Co.  
**SELFOCUS TUBE** Allen B. DuMont Labs.  
**SEL-REX** Bart-Messing Corp.  
**SENSITUNER** Allen B. DuMont Labs.  
**SERRASOID** Radio Eng'g Labs.  
**SERV-A-UNIT** Alden Products Co.  
**SERVICE** Lee Electronic Labs.  
**SERVO BOARD** Servo Corp. of America  
**SERVOSCOPE** Servo Corp. of America  
**SERVO THERM** Servo Corp. of America  
**SERVOSYN** Airborne Accessories  
**SERVOTRON** Raytheon Mfg. Co.  
**SHEFFIBRE** Sheffco Mfg. Co.  
**SHEFFIELD** Sheffco Mfg. Co.  
**SHEFFLITE** Sheffco Mfg. Co.  
**SHEFWIRE** Sheffco Mfg. Co.  
**SHIELD** Ramsell Mfg. Corp.  
**SHIELD** Ramsell Mfg. Corp.  
**SHURE-GRIP** Cons. Wire & Assoc. Co.  
**SHURITE** J. B. T. Instruments  
**SIGNALLETTE** Lytle Eng'g & Mfg.  
**SIGNAL KING ANTENNAS** Walter L. Schott Co.  
**SIGNALOCK** Allen B. DuMont Labs.  
**SIGNA-MATCHER** Centralab, Div. Globe-Union, Inc.  
**SILASTIC** Down Corning Corp.  
**SILECTRON** Arnold Engineering Co.  
**SILENTRONIC** Packard-Bell Co.  
**SILIC-O-NETIC** Heinemann Electric Co.  
**SILVER CAP** F. W. Sickles Div.  
**SILVERSTREAK** Link-Belt Co.  
**SILVERTEX** Erie Resistor Corp.  
**SILVLOY** Permo, Inc.  
**SIMPLEX** General Precision Lab.  
**SINGLE-CORE** Alpha Metals, Inc.  
**SIS** Aline Corp.  
**SKAN** G.M. Laboratories, Inc.  
**SKANDOGRAPH** Nuclear Research & Develop. Co.  
**SKI-HI** General Cement Mfg. Co.  
**SKILLWILL DOIT** Spincraft, Inc.  
**SKL** Spencer Kennedy Labs.  
**SKY-BULLETT** Macon Electronics  
**SKY HIGH** Page-Fogwell Corp.  
**SKY-LITE** Hy-lite Antennas, Inc.  
**SKY-RANGER** JFD Mfg. Co.  
**SKY STREAK** American Electric Cable  
**SKY STREAK** JFD Mfg. Co.  
**SLIDE KING** Charles Beseler Co.  
**SLIDEOHM** Aerovox Corp.  
**SLIMAIR** Electro-Voice, Inc.  
**SMA** Lytle Eng'g & Mfg. Co.  
**SMC** St. Mary's Carbon Co.  
**SMATCO** Stone City Machine  
**SNA-A-ROUND JACKET** Haydon Products Corp.  
**SNIFFER** Johnson-Williams, Ltd.  
**SNOOPER** Precision Radiation Instruments
- SNUPEC** Centralab, Div. Globe-Union, Inc.  
**SODEREZE** Phelps Dodge Copper  
**SOLDERFORMS** Kester Solder Co.  
**SOLDERMASTER** Hexacon Electric Co.  
**SOLREX** Herzog Miniature Lamp  
**SONA-GRAPH** Kay Electric Co.  
**SONARMETER** Raytheon Mfg. Co.  
**SONA-SWEEP** Kay Electric Co.  
**SONAX** Electro-Voice, Inc.  
**SONIZON** Magnaflux Corp.  
**SOMODYNE** Shure Brothers, Inc.  
**SONOTAPE** Electronic Specialties  
**SOUND CELL** Brush Electronics Corp.  
**SOUND MIRROR** Brush Electronics Corp.  
**SPECO** Special Products Co.  
**SPEEDCRAFT** Wire Stripper Co.  
**SPEECH MASTER** Jensen Mfg. Co.  
**SPEE-DFE** Radiant Corp.  
**SPEEDEX** General Cement Mfg. Co.  
**SPEED NUT** Tinnerman Speed Nuts  
**SPEED SORT** Associated Research, Inc.  
**SPEED-X** E. F. Johnson Co.  
**SPEEDY SHIFT** Wincharger Corp.  
**SPHEREX** Electro-Voice, Inc.  
**SPINLAB** Special Instruments Lab.  
**SPIRALON** Surprenant Mfg. Co.  
**SPIRALPOT** G. M. Giannini & Co.  
**SPIRASHIELD** Muter Co.  
**SPIRATUBE** Flexible Tubing Corp.  
**SPLAC** Western Lithograph Co.  
**SPLICE CAP** Buchanan Electrical  
**SPOT-O-GRAPH** Audio Master Corp.  
**SPRAY BOOTH SHIELD** Ramsell Mfg. Corp.  
**SPRAY-KOAT** General Cement Mfg. Co.  
**SPRA-SHIELD** Ramsell Mfg. Corp.  
**SPRING-O-MATIC** Industrial Electrical  
**SPRING-ACTION** Sheldon Electric Co.  
**STABILINE** Superior Electric Co.  
**STACO** Standard Electrical  
**STANCOR** Standard Transformer  
**STANDEE** Clarostat Mfg. Co.  
**STAN-GARD** JFD Mfg. Co.  
**STA-PUT** Cons. Wire & Assoc. Co.  
**STATIC-ERASER** Allen B. DuMont Labs.  
**STATION** General Precision Lab.  
**STATIFLUX** Magnaflux Corp.  
**STATUE OF LIBERTY** American Comm. Corp.  
**STAVOLT** McCulpin-Christie Corp.  
**STC** Sterling Transformer  
**STEADIBEAM** Allen B. DuMont Labs.  
**STEG** Arnold Ceramics, Inc.  
**STENOTAPE** Electronic Specialties  
**STEINLITE** Fred Stein Labs.  
**STETHOSCOPE** Feiler Eng'g & Mfg. Co.  
**STORM MASTER** Wincharger Corp.
- STR** St. Regis Paper Co.  
**STRATOLINER** Shure Bros., Inc.  
**STRATOVISION** Westinghouse Electric  
**STRESS COAT** Magnaflux Corp.  
**STRIPMASTER** Ideal Industries, Inc.  
**STRIPOHM** Ward Leonard Electric  
**STROBO-LITE** Wilcox Research Corp.  
**STROBOLUX** General Radio Co.  
**STROBONAR** Heiland Research Corp.  
**STROBOTAC** General Radio Co.  
**STUDIO** Symphonic Radio & Electronic Corp.  
**STUPLITH** Stupakoff Ceramic  
**STYCAST** Emerson & Cuming, Inc.  
**STYROFLEX** Phelps Dodge Copper  
**SUB-MINI-SHIELDS** Staver Co., Inc.  
**SUBURBAN** Radion Corp.  
**SUNSWITCH** Ripley Co.  
**SUPER** Union Spring & Mfg.  
**SUPER-BEAM** JFD Mfg. Co.  
**SUPER BOOM-LITE** O'Neil-Irwin Mfg. Co.  
**SUPER-COR** Cornish Wire Co.  
**SUPERIOR** Brach Mfg. Corp.  
**SUPERIOR** P. Wall Mfg. Co.  
**SUPERLITE** Projection Optics Co.  
**SUPER LUXAR** Par Products Corp.  
**SUPERMALLOY** Arnold Engineering Co.  
**SUPER-PRO** Hammarlund Mfg. Co.  
**SUPER Q** Edwin I. Guthman & Co.  
**SUPER REG-U-VOLTS** Gramer Transformer Co.  
**SUPER SNIFFER** Nuclear Instrument & Chemical Corp.  
**SUPERSPEED** Enthoven Solders, Ltd.  
**SUPERTONE** Philmore Mfg. Co.  
**SURCO** Surprenant Mfg. Co.  
**SURF** G.M. Laboratories, Inc.  
**SURFACE ANALYZER** Brush Electronics Corp.  
**SURFLENE** Surprenant Mfg. Co.  
**SURFLEX** Surprenant Mfg. Co.  
**SURFLON** Surprenant Mfg. Co.  
**SYLVALOY** Wilbur B. Driver Co.  
**SWEEPMASTER** Mfrs. Eng'g. & Equipment  
**SWITCHMAT** Recora Co.  
**SWITCH-O-LITE** Heffman Engineering  
**SYMPHONETTE** Hedco Mfg. Corp.  
**SYNCHROMITE** Heiland Research Corp.  
**SYNCHROMOUNT** M. G. Giannini & Co.  
**SYNCHRONAR** Heiland Research Corp.  
**SYNCHROPRINTER** Analex Corp.  
**SYNCHROPHONE** Magnetic Recording Industries  
**SYNCROLL** Fairchild Recording Equip. Corp.  
**SYNCRO-NODE** Crosley Div., Avco Mfg.  
**SYNCRO-VALVE** Bristol Co.  
**SYNCROVERTER** Bristol Co.  
**SYNCTRON** Dormitzer Electric  
**SYNKOTE** Plastoid Corp.
- SYNTHINOL** Cons. Wire & Assoc. Cos.  
**SYNTHOLVAR** Varflex Corp.  
**TACO** Technical Appliance  
**TACOPLEX** Technical Appliance  
**TAG** Weston Electrical Instrument Corp.  
**TALKIE TAPES** Talking Devices Co.  
**TALKING TABLE** Magnetic Recording Industries  
**TAMCO** Alliance Mfg. Co.  
**TAPECASTER** Electronic Specialties  
**TEECO** Trutone Electronic Eng'g  
**TELECAP** Sprague Electric Co.  
**TELECASTER** Packard-Bell Co.  
**TEL-A-COL** Magnetic Core Corp.  
**TEL-A-PIPE** Western Lithograph Co.  
**TELCO** General Cement Mfg. Co.  
**TELESCENE** Enthoven Solders, Ltd.  
**TELECORD** Whitney Blake Co.  
**TELECODER** Telecomputing Corp.  
**TELECORDEX** Telecomputing Corp.  
**TELECRANE** Mine Safety Appliances  
**TELECRUISER** Allen B. DuMont Labs.  
**TELEDELTA** Western Union Telegraph  
**TELEDUCER** Telecomputing Corp.  
**TELEDUCT** Whitney Blake Co.  
**TELEFUNKEN** American Elite, Inc.  
**TELEMIX** Hamilton Electronics  
**TELE-PLEX** JFD Mfg. Co.  
**TELEPLOTTER** Telecomputing Corp.  
**TELEPRENE** Whitney Blake Co.  
**TELEREADER** Telecomputing Corp.  
**TELEREADDEX** Telecomputing Corp.  
**TELEREGISTER** Teleregister Corp.  
**TELESET** Allen B. DuMont Labs.  
**TELESTRIP** Allen B. DuMont Labs.  
**TELESWITCH** Hamilton Electronics  
**TELETENNA** Packard-Bell Co.  
**TELETRANSCRIPTION** Allen B. DuMont Labs.  
**TELETRON** Allen B. DuMont Labs.  
**TELEVIDER** Electro-Voice, Inc.  
**TELEVOTER** Jackson Electrical Instrument Co.  
**TEL-OHMIKE** Sprague Electric Co.  
**TELOJECTOR** Gray Research & Devel.  
**TEMCO** Thermo Electric Mfg. Co.  
**TEMCO** Transmitter Equip. Mfg.  
**TEMCOMETER** Thermo Electric Mfg. Co.  
**TEMP-ALARM** Tempil Corp.  
**TEMPILAQ** Tempil Corp.  
**TEMPIL-PELLETS** Tempil Corp.  
**TEMPILSTIKS** Tempil Corp.  
**TENITE** Eastman Chemical Prods.  
**TENNA-CLIP** Industrial Television  
**TENNA-SHINGLE** Javex  
**TENNA-TOP** Electro-Voice, Inc.  
**TENSITE** Wilbur B. Driver Co.
- TERMEND** Buchanan Electrical  
**TESCO** Eastern Specialty Co.  
**TEST-GLO** Ideal Industries, Inc.  
**TESTISEL** Electronic Devices, Inc.  
**TEST MASTER** Precision Apparatus Co.  
**TEST-O-LITE** Brach Mfg. Corp.  
**TETALINER** Mfrs. Eng'g. & Equipment  
**TEXTOLITE** General Electric Co., Chemical Dept.  
**TFC** Trenton Transformer Corp.  
**THERATRON** Bracke-Seib X-Ray Co.  
**THERM-FLEX** Radio Ceramics Corp.  
**THERMINDEX** Tempil Corp.  
**THERMO-ALARM** Mack Electric Devices  
**THERMO GRIP** Ideal Industries, Inc.  
**THERMO-HUMIDOGRAPH** Bristol Co.  
**THERMOSWITCH** Fenwal, Inc.  
**THERMO TIP** Ideal Industries, Inc.  
**THERMOVERTER** Bristol Co.  
**THESAURUS** Radio Corp. of America  
**3100 DISTRIBUTION SYSTEM** Electro-Voice, Inc.  
**THOMEOPRENE** Whitney Blake Co.  
**THRUPASS** Sprague Electric Co.  
**TICNOGRAPHY** Technology Instrument  
**TICONDEROGA** Joseph Dixon Crucible  
**TINCL** American Solder & Flux  
**TIOGA** Sheldon Electric Co.  
**TIOLEKTRIK** American Lava Corp.  
**TITEGRIP** Dante Electric Mfg. Co.  
**TITLEMASTER** Flett Lab.  
**TITONE** Sonotone Corp.  
**TITRILOG** Consolidated Eng'g. Corp.  
**TOBE** Tobe Deutschmann Corp.  
**TOM BOY** Automatic Radio Mfg.  
**TOM THUMB** Automatic Radio Mfg.  
**TONE-ALARM** Mitchell Mfg. Co.  
**TONG TEST** Columbia Electric Mfg.  
**TOPPET** Wilbur B. Driver Co.  
**TOP-LAY** Metals & Controls Corp.  
**TORCHMASTER** Industrial Eng'g Prods  
**TORKRITE** Cleveland Container Co.  
**TORQUE-DRIVE** Electro-Voice, Inc.  
**TOUCH-O-MATIC** Automatic Radio Mfg. Co.  
**TRACEOMETER** Hickok Electrical Instrument Co.  
**TRADIO** Trad Television Corp.  
**TRADIOVISION** Trad Television Corp.  
**TRANSAIR** Hoffman Radio Corp.  
**TRAN-COR** Armco Steel Corp.  
**TEMPIL-PELLETS** Permo, Inc.  
**TRANSFILTER** Brush Electronics Corp.  
**TRANSKOTE** Pancro-Mirrors, Inc.  
**TRANSMATER** Lyso Mfg. Co.  
**TRANSTAT** Standard Electronics  
**TRANSVERTER** Hertner Electric Co.  
**TRANS-VUE** Jackson Industries

## BRAND and TRADE NAME INDEX

TRIAXIAL Jensen Mfg. Co.	TURBOLENE Wm. Brand & Co.	UNIVERSAL Mueller Electric Co.	VERSATEX Shure Bros. Inc.	VOLCANO Industrial Eng'g. Prods.	WESTACH Westberg Mfg. Co.
TRICENE Enthoven Solders, Ltd.	TURBOLEX Wm. Brand & Co.	USALITE Stupakoff Ceramic Mfg.	VERSA-TOOL Phillips Mfg. Co.	VOLTAGE Sittler Corp.	WESTBOOSTER Western Mfg. Co.
TRI-CORE Alpha Metals, Inc.	TURBOSIL Wm. Brand & Co.	USECO U. S. Eng'g Co.	VERTAR Par Products Corp.	VOLT-A-TEST Sittler Corp.	WESTENNA Western Mfg. Co.
TRIG TOWERS Rostan Corp.	TURBOTHERM Wm. Brand & Co.	UTC United Transformer Co.	VERTICAL DRIVE Shure Brothers, Inc.	VOLTOHYMST Radio Corp. of America	WHALE Forsberg Mfg. Co.
TRIM TROL Airborne Accessories	TURBOTRANS Wm. Brand & Co.	UTILISCOPE Diamond Power	VIBRAGLASS Glass Fibers, Inc.	VOLTOSTAT Industrial Transformer	WHARFEDALE British Industries Corp.
TRIONIZED AIR Trion, Inc.	TURBOTUF Wm. Brand & Co.	VA Varian Associates	VIBRALYZER Kay Electric Co.	VOYAGER Magnecord, Inc.	WHITE FLASH Enthoven Solders, Ltd.
TRIG-R-HEAT P. Wall Mfg. Co.	TURBOZONE Wm. Brand & Co.	VACORDER F. J. Stokes Machine Co.	VIBRO GROUND Associated Research	V-TEST-IT Mercury Electro Prods.	WINCO Winstead Div., Hudson Wire Co.
TRI-PLAX Sta-Warm Electric Co.	TWILT Electro-Voice, Inc.	VALVSEAL Richardson Co.	VIBROMIKE Brush Electronics Corp.	VTPCO Vacuum Tube Products	WINCH Wincharger Corp.
TRIP-LETT Triplett Electrical Instrument Co.	TWINSET Telex, Inc.	VAMISTOR Ruckelshaus Labs. Inc.	VIBROTEST Associated Research	VU-CYTE Charles Beseler Co.	WIRE-OHM Phaotron
TRI-PLEX Jensen Mfg. Co.	TWIN-TILT Electro-Voice, Inc.	VAREC Vapor Recovery Systems	VICTOR Radio Corp. of America	VU-GRAPH Charles Beseler Co.	WIRENUTS Ideal Industries, Inc.
TRI-TRAN Triwec Transformer Co.	TWIST-LOCK Harvey Hubbell, Inc.	VARFLO Varflex Corp.	VIDEA-BEAM Camburn, Inc.	VULCROID Continental-Diamond Fibre Co.	WIREWATT Ohmite Mfg. Co.
TROPI-TILE Tropicraft	TWIST-LOK Sprague Electric Co.	VARGLAS Varflex Corp.	VIDEOFILM General Precision Lab.	VULCOT National Vulcanized Fibre Corp.	WONDERFLUX American Silver Co.
TRUARC Waldes Kohinoor, Inc.	TWO-TIMER Vocaline Co. of America Inc.	VARIAC General Radio Co.	VIDEOMETER Hickok Electrical Instrument Co.	VX'ER Eldico of New York, Inc.	WOOD-RAY Woodwelding, Inc.
TRU-BRAND SPEAKERS Carboneau Industries	TWIST-TITE Harvey Hubbell, Inc.	VARICELL Superior Electric Co.	VIDEOPTICS Burke & James, Inc.	VYCOR Corning Glass Works	WOROMETER Stewart Instrument Co.
TRUFLEX Metals & Controls Corp. General Plate Div.	U-ASK-IT Electronic Eng. Co.	VARISPEED Audio Master Corp.	VIDEOSTIGMAT Burke & James, Inc.	WALL-O-MATIC JP Seeburg Corp.	WULLSCHLEGER LIGHTING CONTROL Inter-Communications
TRU-MATCH Quam-Nichols Co.	ULTRATONE Audio Industries, Inc.	VARITAR Par Products Corp.	VIKING Jensen Mfg. Co. E. F. Johnson Co.	WALL-THRU Mosley Electronics, Inc.	XCEL Xcelite, Inc.
TRU-OHM Model Eng'g & Mfg.	ULTRATUBE Plastoid Corp.	VARITRON Photographic Products	VINYLITE Bakelite Co. Div. Union Carbon & Carbide Corp.	WALSCO Walter L. Schott Co.	XTALECTOR Valpey Crystal Corp.
TRU-RIP Whitney Blake Co.	UMP Illinois Condenser Co.	VARSITY Symphonic Radio & Electronic Corp.	VISI-MAG Magnecessories	WALSCOLUB Walter L. Schott Co.	X-VAR Fidelity Chemical Prods.
TRU-SONIC Stephens Mfg. Corp.	UNBRAKO Standard Pressed Steel Co.	VECTOLYZER Advance Electronics Co.	VISUAL CAST Victorlite Industries	WAT Walser Automatic Timer	XY SYSTEMS Stromberg-Carlson Co.
TRUTORQ Airdraulics Eng'r Inc.	UNESCO Western Mfg. Co.	VEE-D-X La Pointe Electronics	VITAMIN Q Sprague Electric Co.	WATERSON J. W. Davis & Co.	Z-ANGLE METER Technology Instrument Corp.
TRYLON TOWERS Wind Turbine Co.	UNIBELT Walter L. Schott Co.	VEECO Vacuum Electronic Eng'g.	VITAVOX British Industries Corp.	WELCOR Webster-Chicago Corp.	"ZEE" LINE National Electric Prods.
T-35 SUPER-SONAX Electro-Voice, Inc.	UNICON United Condenser Corp.	VEGO Victory Eng'g Corp.	VITROTEX Anaconda Wire & Cable	WELDRAWN Superior Tube Co.	ZIPOHM Muter Co.
TUBE CADDY Argos Products Co.	UNI-CRIMP H. B. Sherman Mfg. Co.	VELVETRONIC Packard-Bell Co.	VIZ PRODUCTS Molded Insulation Co.	WELTONOIL Welton V. Johnson Eng'g.	ZIPPER CAPACITORS Centralab, Div. Globe-Union, Inc.
TUBE MASTER Precision Apparatus Co.	UNIDYNE Shure Brothers, Inc.	VERICOLOR Remington-Rand, Inc.	V-KING ANTENNAS Walter L. Schott Co.	WESCO West Coast Elec. Mfg.	ZOOM-UP JFD Mfg. Co.
TUCK-AWAY JFD Mfg. Co.	UNI-GLOW Miskell Infra-Red Co.	VERICON Remington Rand Co.	VOCATRON Vocaline Co. of America	WESGO Western Gold & Platinum	ZYGLO Magnaflux Corp.
TUNE-O-MATIC Electro-Voice, Inc.	UNI-LOCK Macon Industries	VERMICULITE Mica Fabricating Co.	VOICE MASTER Magnetic Recording Industries		ZYROX Bakelite Co. Div. Union Carbide & Carbon
TURBO William Brand & Co.	UNI-RACK Alden Products Co.				
TURBOGLAS Wm. Brand & Co.	UNISORB Filters Co.				
TURBOLAC Wm. Brand & Co.	UNIVERSAL Brush Electronics Corp.				

## Engineering Societies

Alphabetical listing of professional societies, industry associations and technical organizations serving the radio-TV-electronic and allied fields

Acoustical Society of America, 57 E. 55 St., New York, N. Y.  
 American Institute of Electrical Engineers, 33 W. 39 St., New York, N. Y.  
 American Institute of Physics, 57 E. 55 St., New York, N. Y.  
 American Radio Relay League, 38 La Salle Rd., W. Hartford, Conn.  
 American Society for Quality Control, 70 E. 45 St., New York, N. Y.  
 American Society for Mechanical Engrs., 33 W. 39 St., New York, N. Y.  
 American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.  
 American Standards Ass'n., 80 E. 45 St., New York, N. Y.  
 American TV Society, 52 Vanderbilt Ave., New York 17, N. Y.  
 Antenna Mfrs Ass'n., 36 Madison Ave., New York 17, N. Y.  
 Armed Forces Communications Ass'n., 1624 Eye St., N. W., Washington 6, D. C.  
 Associated Police Communication Officers, 1428 W. 46 St., Los Angeles 37, Calif.  
 Ass'n. of Electronic Parts & Equip. Mfrs., 11 S. LaSalle St., Chicago 3, Ill.  
 Ass'n. of Federal Communications Consulting Engrs., 1216 Wyatt Bldg., Washington 5, D. C.  
 Ass'n. for Computing Machinery, % E. Bronberg, Sec'y., Inst. of Math. & Mech.,

N.Y.U., 45 Fourth Ave., New York, N. Y.  
 Audio Eng'g Society, Box F, Oceanside, N. Y.  
 Electrochemical Society, 235 W. 102 St., New York, N. Y.  
 Electronic Mfrs. Ass'n., 575 Madison Ave., New York, N. Y.  
 Electronic Parts Mfrs Ass'n., 430 Wyatt Bldg., Washington 5, D. C.  
 Federal Communications Bar Ass'n., Saler Bldg., Washington 4, D. C.  
 Institute of Aeronautical Sciences, 2 E. 64 St., New York, N. Y.  
 Institute of Radio Engineers, 1 E. 79 St., New York 21, N. Y.  
 Instrument Society of America, 1319 Allegheny Ave., Pittsburgh 33, Pa.  
 National Ass'n of Electrical Distributors, 290 Madison Ave., New York, N. Y.

### OMISSIONS

This electronic industries directory has been compiled with the utmost care and thoroughness. Listings have been omitted in all cases where, after three requests, a company has failed to return our directory questionnaire or otherwise verify its activity.

National Ass'n. of Radio & TV Broadcasters, 1771 N St., N. W., Washington 6, D. C.  
 National Audio-Visual Ass'n., 845 Chicago Ave., Evanston, Ill.  
 National Community TV Ass'n., P.O. Box 184, Pottsville, Pa.  
 National Electrical Mfrs. Ass'n., 155 E. 44 St., New York 17, N. Y.  
 National Electronic Distributors Ass'n., 221 N. LaSalle St., Chicago 1, Ill.  
 N. Y. State Society of Professional Engrs., 1941 Grand Cent. Term., New York, N. Y.  
 National Electronics Conference, 852 E. 83 St., Chicago 19, Ill.  
 National Society of Professional Engrs., 1121 15 St., Washington 5, D. C.  
 Phonograph Mfrs. Ass'n., 277 Broadway, New York 7, N. Y.  
 Radio Club of America, 11 W. 42 St., New York 17, N. Y.  
 Radio Pioneers, 580 Fifth Ave., New York 18, N. Y.  
 Radio-T-V Mfrs. Ass'n., 777 14 St., N. W., Washington 5, D. C.  
 Record Industry Ass'n. of America, 270 Park Ave., New York, N. Y.  
 Representatives of Electronic Products Mfrs., 600 S. Mich. Ave., Chicago 5, Ill.  
 Scientific Apparatus Mfrs. Ass'n., 20 N. Wacker Drive., Chicago 6, Ill.  
 Society of Motion Picture & Television Engrs., 40 W. 40 St., New York 18, N. Y.  
 Society of Plastic Engrs., 409 Security Bank Bldg., Athens, Ohio.  
 Society of the Plastic Industry, 67 W 44 St., New York, N. Y.  
 West Coast Electronic Mfrs. Ass'n., 4054 Ocean Park Ave., Venice, Calif.

# ELECTRONIC INDUSTRIES DIRECTORY

## Distributors

These are the names and addresses of organizations handling the distribution of radio-TV-electronic parts and equipment in the United States. Listings are alphabetical under states and cities. Asterisk (\*) indicates membership in National Electronic Distributors Association (NEDA).

### ALABAMA

**ANNISTON**  
Radio Dist & Supply 1029 Gurnell 4010

**BIRMINGHAM**  
Ack Radio Supply 2205 3 Ave N E 4-0588  
Afr Engineers 1529 2 Ave 54-3431  
Auto Service 1916 4 Ave S 3-4102  
Clark & Jones 1601 2 Ave S 4-4529  
\*Clary Co J W 1713 2 Ave S 4-2488  
Forbes Distr 2600 3 Ave S 3-4105  
Graybar Elec 709 1 Ave N 4-1861  
Lewis Supply Co 1025 N 19 St 7-1148  
Long Lewis Hdwe 430 N 9 St 4-2561  
McDavid & Co R P 1430 2 Ave N 7-7165  
Radio Parts & Equip 1909 5 Ave N 4-4405  
\*Reid Distributing 1724 5 Ave N 4-8652  
Steel City Supply 600 N 7 St 4-0433

**DECATUR**  
Radio & Television Supply 415 Bank 2231

**DOTHAN**  
Hand Supply Co 705 S Oates 4-3300  
Signal Supply Co 248 E Troy 4-0360

**GADSDEN**  
Southeastern Radio Parts Hdqrs Atlanta Ga

**JASPER**  
Ramco Radio Supply 20 St & 2 Ave 2-5321

**MOBILE**  
Emrich Radio Supply 656 Dauphin 8-2596  
General Elec 54 Eslava St 8-4571  
Graybar Elec 73 Lipscomb St 2-3511  
Harris Supply 10 N Water 2-0541  
McDavid & Co 120 Water St 8-1691  
McGowan-Lyons Water & St Louis Sts 2-8721  
\*Nelson Radio 451 St Louis 2-0411  
Radio Labs 111 N Royal 2-1715

**MONTGOMERY**  
Nolin-McInnis 205 Commerce 7323  
Southeastern Radio Parts 210 Court St  
Teague Hardware 204 Commerce St  
Walther Bros 115 Commerce 2-0369

**TUSCALOOSA**  
\*Allen & Jemison Co 8-2781

### ARIZONA

**PHOENIX**  
Arcal Radio Parts 532 W Van Buren Al 3-4023  
Dafis Bros 528 W Jefferson St  
Electrical Comm 202 E Fillmore Al 2-8248  
Electrical Equip 1 Ave at Madison 3-3186  
General Electric 441 W Madison 4-1116  
Gough Industries See Los Angeles Calif  
Graybar Electric 434 W Madison 3-6131  
Mathias & Co Albert Hdqrs El Paso Tex  
Midland Specialty 233 S 11 Ave W Al 4-7351  
Momsen-Dunnegan-Ryan 11 E Buchanan  
\*Radio Parts of Ariz 214 S 11 Ave Al 8-6476  
Radio Spec & Appl 305 E Roosevelt  
Redmond Supply J F 625 W Madison  
Southwest Wholesale Radio Box 3647  
Western Radio & Eng 1915 E Wash 4-7084  
Westinghouse Elec 110 N 21 4-9276

**TUCSON**  
General Electric 2 E 6 St 3-4773  
\*Elliott Electronics 418 N 4 Ave  
\*Standard Radio Parts 218 N 1 Ave

### ARKANSAS

**BLYTHEVILLE**  
Blytheville Radio Supply 112 S 1 St 4467

**FORT SMITH**  
Carter Electronic 805 N 11 St 6095  
Interstate Electric Hdqrs Shreveport La  
\*Wise Radio Supply 1001 Towson 3-8926

**LITTLE ROCK**  
Carlton Wholesale 109 W 9 St 27-9248  
General Electric 601 E Markham 5-5328  
Graybar Electric 417 Byrd St  
Southern Radio 1417 Main 2-4198  
Thurman Supply 115 W 11 St 7308  
Westinghouse Elec 119 Sherman 2-5154  
\*White Radio Supply 1222 Main 5-1283

**PARAGOULD**  
Martin Wholesale 1207 W Kings Highway 40+9

**TEXARKANA**  
Interstate Electric Co Hdqrs Shreveport La  
\*Lavender Radio Supply 520 E 4 St 36-2757

### CALIFORNIA

**ALHAMBRA**  
\*Coast Electronic Supply 527 W Main Cu 3-4049

**BAKERSFIELD**  
Arbuckle J C 417 E 19 St 5-5816 Hdqrs Fresno  
General Electric 1134 33 St 5-5514  
Valley Radio Supply 716 Baker St

### BERKELEY

Kaemper & Barrett 1940 Ashby Th 3-8900 Hdqrs San Francisco

**BURBANK**  
Dean Co F S 1500 W Burbank Ch 8-4408 Hdqrs Long Beach  
Pacific Radio Exch 4101 W Burbank Hdqrs Hollywood  
Valley Electronic Supply 1302 N Magnolia Blvd

**EUREKA**  
Commercial Radio & Elec 317 W 7 St HI 2-4179

**FRESNO**  
Arbuckle J C 2330 Kern 4-6555  
DeJarnatt Whsle B J 223 Fulton 2-2153  
General Elec Supply 1234 O St 4-4746  
Graybar Electric 101 Van Ness Ave 2-4175  
Kierulff & Co 725 L St Hdqrs Los Angeles  
Kinney & Faust 1740 Van Ness 6-8321  
Meyberg Co L J 2930 Butler Hdqrs San Francisco  
Ports Mfg Co 3265 Belmont 3-6728  
Schiefer Sound 2121 Blackstone 7-7234  
Westinghouse Elec 2608 Calif 4-5091

**GLENDALE**  
Hagerty Radio 6826 San Fernando Rd CH 8-6853  
\*Weatherford Co R V 6921 San Fernando RO 9-2281

**HOLLYWOOD**  
Hollywood Radio 5606 Hollywood HO 9-7294  
Pacific Radio Exch 1407 Cahuenga HW 2-1393  
Yale Radio Elec 6616 Sunset Blvd GL 4169

**HUNTINGTON**  
Martin Dist Co 2475 E Florence Ave

**INGLEWOOD**  
Acron Radio 599 S La Brea OR 8-5344

**LONG BEACH**  
Dean Co F S 969 American NE 6-4837  
Gough Industries 838 W Anaheim Hdqrs Los Angeles  
Graybar Electric 17 E Daisy St 70-2911  
Kierulff & Co 1760 Pacific Ave Hdqrs Los Angeles  
Ley Co Elwyn W 5550 Dairy Ave 20-5444  
Lynde Electronics 1526 E 4 St 7-4807  
Radio & TV Equip 2227 Pacific Hdqrs Santa Ana  
\*Scott Radio Supply 266 Alamitos 7-8629  
Waller Inc H T 645 W 15 St 35-4844

**LOS ANGELES**  
Bell Radio Supply 1311 W Florence Ave  
Calif Electronic Supply 11801 W Pico Blvd BR 2-2126  
Dunkle Radio Parts 2506 W 8 St  
\*Federated Purchasers 911 S Grand TR 1761  
Figart's Radio 6320 Comm Sloat Dr YO 6218

General Elec Supply 700 Turner St MA 7141  
Gerstman Dist 414 S Western DU 8-2238  
G.L. Electronics 905 S Vermont DU 7-5104  
Gough Industries 819 E 1 St 5-5907  
Graybar Electric 210 Anderson AN 3-7282  
Henderson Co 628 N Alvarado DU 2-8301  
Kierulff Electronics 820 W Olympic RI 7-0271  
Los Angeles Radio 10215 Venice VE 8-3177  
Martin Dist Co 2475 E Florence LO 5-7111  
Meyberg Co L J 2027 S Figueroa RI 7-4451  
National TV Supply 4032 S Figueroa AD 3-8058  
Olympic Elec 1440 W Olympic DU 8-2233  
Pacific Radio Exch 1407 Cahuenga Blvd HU 2-1393  
\*Papel Bros 2605 E 4 St AN 2-5151  
Quality Television 1235 E Olympic TR 9761  
\*Radio Equip Dist 1340 S Olive St PR 9151  
Radio Parts Sales 5220 S Vermont TW 9178  
\*Radio Prod Sales 1501 S Hill PR 7471  
Radio Spee 1956 S Figueroa PR 7271  
Radio TV Sup 341 W 18 St RI 9131  
Ravenscroft Co 2320 S Hill PR 1317  
Shelley Radio 2008 Westwood BR 2-5639  
United Radio & Elec 1924 S Grand RI 7-0441  
\*Univ Radio Sup 1729 S Los Angeles PR 5241  
Westinghouse Elec Sup 905 E 2 MA 9-4161  
Wholesale Radio & TV Sup 4305 S Figueroa St AD 3-8171  
Yale Radio Electric 6616 Sunset Blvd GL 4169

**MARYSVILLE**  
\*Dunlap Whsle Radio 3-3851 Hdqrs Stockton

**MODESTO**  
Dunlap Whsle Radio 3-3067 Hdqrs Stockton  
Pacific Teletronic & Radio Sup 417 7 St

**NORTH HOLLYWOOD**  
Hycor Sales 11423 Vanowen St  
N Hollywood Radio 4333 Lankershim St 7-3063

**OAKLAND**  
Brill Co W D 198 10 St EN 1-0177  
Cass Altschuler Co 6038 Telegraph Ave  
Electric Supply 140 11 St  
Elmar Electronics 140 11 St  
General Elec Supply 5400 Hollis 3-4433  
Graybar Elec 1911 Union St GL 1-5451  
\*Millers Radio & TV 336 E 8 St TW 3-3848  
Raycraft Co 568 3 St TW 3-9698  
Wenger Co E C 1450 Harrison GL 1-1020  
Westinghouse Elec 711 E 8 TE 4-9900

**PALO ALTO**  
Zack Radio 225 Hamilton DA 5-5678 Hdqrs San Francisco

**PASADENA**  
Dow Radio 1759 E Colorado RY 1-6683  
Electronic Supply 2615 E Foothill RY 1-7188  
Empire Electronic Dis 37 E Union St RY 1-7671

**POMONA**  
Acorn Radio & Elec 936 E Holt Ave LY 9-2650  
Hdqrs Inglewood

**REDWOOD CITY**  
Television-Radio Supply 415 Lathrop St Hdqrs San Francisco

**RICHMOND**  
Millers Radio & TV 319 37 St BE 5-4424 Hdqrs Oakland

**RIVERSIDE**  
Massey's Radio Supply 2992 8 St

**SACRAMENTO**  
Brolli-Parks 2225 19 St GI 2-2983  
Brown Co C C 1714 10 St GI 3-5931  
Capitol Electronics 1714 10 St GI 3-5931  
\*Dunlap Whsle 1628 "S" St GI 2-1031 Hdqrs Stockton  
General Elec Supply 1131 "S" St GI 3-9001

## ELECTRONIC DISTRIBUTORS

Including parts distributors mail order houses and others advertising electronic apparatus and supplies for industrial plants, communication services, laboratories, etc

Allied Electric 3640 Elder St Philadelphia 40 Pa  
Allied Radio Corp 833 W Jackson Blvd Chicago 7 III  
Anthony Distributors 41 Broadway Providence R I  
Broadwin Radio & TV 6516 Calumet Hammond Ind  
Burroughs Radio 711 2 St N Canton 3 Ohio  
Bursma Radio Supply 853 Grandville Ave Grand Rapids Mich  
Burstein-Applebee 1012 McGee St Kansas City 6 Mo  
Chambers Electronic 1669 Central Pkwy Cincinnati 14 Ohio  
Chauncey's 4737 W Chicago Ave Chicago 51 III  
Clayton Radio 2749 N Ashland Ave Chicago 14 III  
Colfax Co 802 S Main St South Bend 18 Ind  
Consolidated Radio 768 Amsterdam Ave New York 25 NY  
Continental Sales 521 Bloomfield Ave Newark 7 N J  
Dale Electronic Distr 150 James St New Haven 13 Conn  
Davis Electronics 204 Main St Hempstead L I N Y  
D & H Distributing 311 S Cameron St Harrisburg Pa  
Edlie Electronics 154 Greenwich New York 6 N Y  
Electronic Expeditors 225 N Wabash Ave Chicago 1 III  
Erickson's Electronic 23525 Woodward Ferndale Mich  
Fischer Dist 118 Duane St New York N Y  
Fitzpatrick Electric 444 Irwin Ave Muskegon Mich  
Graham Electronics 102 S Penna St Indianapolis 4 Ind  
Graybar Electric Co 420 Lexington Ave New York 17 NY  
Harris Radio 289 N Main St Fond du Lac Wis  
Hatty & Young of Mass 811 Boylston St Boston Mass  
H & H Electronic Supply 510 Kishwaukee St Rockford III  
Holub & Hogg 1400 Sycamore St Cincinnati 10 Ohio  
Howards Electronic 135 17 St Toledo 2 Ohio  
Hudson Radio & TV 48 W 48 St New York 36 N Y

Interstate Supply 24 S 10 St St Louis 2 Mo  
Joliet Radio 460 N Chicago St Joliet III  
Kierulff Electronics 820 W Olympic Blvd Los Angeles 15 Calif  
Lifetime Electronics 1501 Adams St Toledo Ohio  
Mayer Co A W 893 Boylston St Boston 15 Mass  
Melvin Electronics 238 Chicago Ave Oak Park III  
Mid-West Associated 506 Walnut St Rockford III  
Mort's Radio Shack 630 W Randolph St Chicago III  
Nidisco 713 Newark Ave Jersey City N J  
Pioneer Radio Supply 1921 Belmont Ave Chicago 13 III  
Radio Distr Co 432 S Carroll St South Bend Ind  
Radio Parts Co 612 W Randolph Chicago III  
Radio Parts Distr 925 E 55 St Chicago 15 III  
Radio Shack 167 Washington St Boston 8 Mass  
Radio Tube Merch 508 Clifford St Flint 3 Mich  
Radio TV Supply 4345 W Armitage Ave Chicago 39 III  
Radio Wire-TV 100 6 Ave New York N Y  
R-B Distributing 3763 Broadway Gary Ind  
Relay Sales 833 W Chicago Ave Chicago 22 III  
Rockbar Corp 211 E 37 New York N Y  
Sanford Electronics 157 Chambers St New York 7 N Y  
Stan-Burn Radio-Electronics 1697 Broadway New York 19 N Y  
Star Electronic Distr 7736 S Halsted St Chicago 20 III  
Terminal Radio 85 Cortlandt St New York 7 N Y  
U S Radio-TV 6602 S Ashland Ave Chicago 36 III  
Walker-Jimieson 311 S Western Ave Chicago 12 III  
Wells Sales 833 W Chicago Ave Chicago 22 III  
Western Distr Salina Kansas  
Wholesale Radio 24 Logan St S W Grand Rapids 2 Mich

# DISTRIBUTORS SERVING the ELECTRONIC INDUSTRIES

Graybar Electric 1900 14 St GI 2-8976  
\*Kemp Co E M 1115 R St GI 3-4668  
Radio Television Prod 1519 19 St  
\*Sacramento Electronics 1219 "S" St GI 2-7679  
Westinghouse Elec 1730 14 St GI 3-6525

**SALINAS**  
Peninsula TV & Radio Hdqrs San Jose

**SAN BERNARDINO**  
Arrowhead Radio & Television 1212 D St 2-5581  
Electronic Equip 1123 W Base Line  
Featherstone Radio & TV 1010 E St 81-1306  
Gough Industries Highway 99 & E St Hdqrs  
Los Angeles  
\*Inland Electronic Supply 843 Colten Ave 6-5571  
Kierulff & Co 1123 W Base Line Hdqrs Los Angeles

**SAN DIEGO**  
Electric Supplies Dist 435 2 Ave  
Electronic Equip Dist 1228 2 Ave F 6547  
General Elec Supply 668 3 Ave FR 9-0271  
Gough Industries 3255 5 Ave W0 0659 Hdqrs  
Los Angeles  
Graybar Electric 720 State St FR 1361  
Kierulff & Co 3791 Park Blvd Hdqrs Los Angeles  
Radio Parts Co 2060 India  
Shanks & Wright 2045 Kettner F 9-0176  
Silvergate Radio Supply 2361 India FR 9-6125  
Western Radio & TV 1415 India St FR 0361

**SAN FRANCISCO**  
\*Assoc Radio Distr 1251 Folsom St HE 1-0212  
\*Brown Co C C 61 9 St MA 1-7000  
Century Distr 1111 Front St YU 2-1480  
Ets-Hokin & Galvan 551 Mission St EX 2-0432  
General Electric Supply 1201 Bryant St UN 3-4000  
Graybar Electric 1750 Alameda St MA 1-5131  
Kaemper & Barrett 1850 Miss UN 3-3080  
\*Meyberg Co L J 33 Gough St MA 1-3400  
\*Pacific Whlsie 1850 Mission St UN 1-4843  
Popkey Co G M 1201 Howard St KL 2-3488  
Radio Parts Supply 281 9 St MA 1-0552  
\*San Francisco Radio 1284 Market UN 3-6000  
\*Smith & Crawford 1345 Mission UN 1-5206  
Tel-Radio Supply 408 Market EX 2-2898  
Westinghouse Elec 201 Potrero UN 1-5051  
\*Wholesale Radio 140 9 St HE 1-3680  
\*Zack Radio Supply 1424 Market MA 1-1424

**SAN JOSE**  
Peninsula TV & Radio 881 S I St CY 4-8781  
\*Quement Inc Frank 161 W San Fernando St  
CY 4-0464

**SAN LEANDRO**  
Styies & Engleman 2255 Baneroff Ave L0 9-9433

**SANTA ANA**  
Radio & TV 207 Oak KI 2-6741

**SANTA BARBARA**  
Channel Radio Supply 523 Anacapa 2-3429  
Gough Industries 404 State St Hdqrs Los Angeles

**SANTA ROSA**  
Santa Rosa Electro 205 Sebastopol 4486-W

**SHERMAN OAKS**  
Oak Radio Supply 13454 Ventura ST 7-6666

**SOUTH GATE**  
Mac's Radio Supply 8320 Long Beach KI 4111

**STOCKTON**  
DeJarnatt Whsle B J 515 N Hunter Hdqrs Fresno  
\*Dunlap Whsle Radio 27 N Grant St 7-7905  
Kemp Co E M 50 N Wilson Way Hdqrs Sacramento  
\*Stockton Electronics 710 E Main St

**VALLEJO**  
Walker Co R Lyman 1401 Hiway 40 VA 3-5321

**VENTURA**  
Dealer's Whsle 265 S Laurel MI 3-6147

**COLORADO SPRINGS**  
Murray Radio Co 9 E Vermijo MA 5946

**DENVER**  
Electric Accessories 1959 Stout St  
Fistella Radio 1047 Broadway MA 3197  
General Electric 1429 18 St KE 6301  
Graybar Elec 104 Wazee Market TA 7116  
Hendrie & Bolthoff 1635 17 St KE 4111  
Inter-State Radio 1639 Tremont TA 5347  
Radio Parts Distr 3040 W Colfax CH 4568 Hdqrs  
Chicago III  
Radio Products Sales 1287 16 St CH 6591  
Sweeney Co B K 1601 23 St KE 6211  
Walker Radio LB 854 Broadway Hdqrs Pueblo  
Wreco Parts of Colorado 780 Broadway

**GRAND JUNCTION**  
Radio & Elec Supply 511 Ute Ave

**PUEBLO**  
Pueblo Radio TV Supply 211 Polk 8515  
\*Walker Radio Co L B 218 W 8 St

**COLORADO**

**BRIDGEPORT**  
Coastal Radio 1106 Barnum Ave 5-7441  
General Elec 335 Cossuth St 68-1621  
\*Hatry of Bridgeport 1700 Main St 5-3124  
Sprague Electrical Supplies Park & R R Aves  
Walldhaus L N 1132 Norman St FA 9-4537  
Westconn Electronics Inc 196 Colorado Ave BR  
67-8671 Hdqrs White Plains NY

**HAMDEN**  
Spinney Co B H Hdqrs Springfield Mass

**HARTFORD**  
Capital Light & Supply 6 Huntley PI 7-8115  
General Elec Supply 2964 Main St 2-4115  
\*Hatry of Hartford 203 Ann St 7-1881  
\*Moses Radio & Elec 54 Flower St 7-7247

**CONNECTICUT**

**BRIDGEPORT**  
Coastal Radio 1106 Barnum Ave 5-7441  
General Elec 335 Cossuth St 68-1621  
\*Hatry of Bridgeport 1700 Main St 5-3124  
Sprague Electrical Supplies Park & R R Aves  
Walldhaus L N 1132 Norman St FA 9-4537  
Westconn Electronics Inc 196 Colorado Ave BR  
67-8671 Hdqrs White Plains NY

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Spinney Co B H Hdqrs Springfield Mass

**HARTFORD**  
Capital Light & Supply 6 Huntley PI 7-8115  
General Elec Supply 2964 Main St 2-4115  
\*Hatry of Hartford 203 Ann St 7-1881  
\*Moses Radio & Elec 54 Flower St 7-7247

Orkil Inc P O Box 208 HA 8-6581  
Roskin Distributors 275 Park Ave 89-9361  
Secfi & Co R G 1249 Main St 2-1144  
Westinghouse Elec 185 Ann St 2-9203  
Wood-Alexander Co 555 Asylum St 7-8125

**KENSINGTON**  
\*Modern Radio 131 Farmington Ave NB 4-0840

**NEW BRITAIN**  
\*United Radio Supply 53 E Main St 3-2731  
Universal Radio Co 61 E Main St

**NEW HAVEN**  
Ammrad Co 843 Grand Ave UN 5-4508  
\*Brown Co T H 15 Whiting St ST 7-2297  
Congress Radio 207 Congress UN 5-6365  
Dale Electronic Div Dale-Conn Inc 150 James  
SP 7-5555  
Electronic Sales 353 Crown St UN 5-0161  
General Elec Supply 74 Forbes St H0 7-6331  
Graybar Electric 15 Union St 8-4163  
\*Hatry of New Haven 77 Broadway St 7-5921  
Westinghouse Elec 240 Cedar SP 7-3601  
Yale Radio-Electric 680 Chapel MA 4-0834

**NEW LONDON**  
Aikins Electronic 428 Bank St 2-4407

**STAMFORD**  
\*Hatry of Stamford 97 Main St  
Stamford Radio Supply 562 Atlantic St

**WATERBURY**  
\*Bond Radio Supply 439 W Main St 3-2149

**DELAWARE**

**WILMINGTON**  
Almo Radio Co 6 & Orange Sts Hdqrs Philadelphia Pa  
Delaware Electronics 205 W 4 St 4-7932  
General Electric 310 S Market St 5-5561  
Graybar Electric 1005 W 4 St  
Radio Electric 3 & Tatnall Sts 6-8664  
Westinghouse Electric 400 S Market 5-9611  
Wholesale Electronic Supply 411 N Madison 6-1144  
Wilmington Elec Supply 405 Delaware Ave 5-4321

**DISTRICT OF COLUMBIA**

**WASHINGTON**  
\*Capitol Radio 2120 14 St N W H0 2-0800  
Educational Labs 1625 Conn N W DU 3434  
\*Electronic Whsle 2345 Sherman N W HU 5200  
General Electric Supply 705 Edgewood St N E  
HU 6800  
Graybar Elec 60 Fla Ave N E AD 4-4800  
Kenyon Radio Supply 2020 14 St DE 5800  
\*Rucker Electronic 1312 14 St N W MI 8544  
\*Silberne Radio 3308 11 St N W H0 2-7669  
SE Radio Whsleers 2027 Nichols S E LU 4-5142  
Southern Whsleers 707 Edgewood N E HU 3422  
Sun Parts Distr 520 10 St ME 8-2697  
Westinghouse Elec 1216 K St NA 9700

**FLORIDA**

**DAYTONA BEACH**  
Hammond-Adams 228 Volusia Hdqrs Orlando

**FORT LAUDERDALE**  
Goddard Distr 2113 S Andrews Ave Hdqrs W Palm  
Beach

**GAINESVILLE**  
Baird Hardware Co 101 E Main St 8531

**JACKSONVILLE**  
Aeme Electronics Distr 811 Main St 6-0485  
Bent Distributing Co 4012 W Beaver St  
General Elec Supply 530 E Forsyth St 3-9011  
Graybar Electric 12 & Main Sts 6-7611  
Kinkade Radio 1402 Laura Hdqrs Tampa  
Major Appliances 536 E 4 St Hdqrs Miami  
Radio Parts Co 1411 Main St  
Southeast Audio Co 930 W Adams St 4-6372  
Southern Hardware 11 S Newman St  
Thurow Distributors 15 E Church St 5-3727  
Westinghouse Elec 545 E 4 St 3-7431

**LAKELAND**  
Hammond-Adams 116 W Lemon St Hdqrs Orlando  
Radio Accessories 1054 S Florida Ave Hdqrs Orlando

**MIAMI**  
East Coast Radio 1932 N W Miami Ct 82-4636  
Electronic Supply 61 N E 9 St 9-4503  
Flagler Radio Co 1068 W Flagler St  
General Electric Supply 811 N W 1 Ave 82-1521  
Graybar Electric 855 N W 1 Ave 2-3168  
\*Herman Radio Supply 1365 N W 23 St 82-5431  
Major Appliances 2201 N W 17 Ave 3-5533  
Radio Parts Inc 325 N W 3 Ave 2-7441  
Sea Coast Appl Dist 1481 N W 22 St 9-1761  
Thurow Distributors 2207 N E 2 Ave 9-6571  
\*Walder Radio & Appl 1809 N E 2 Ave 2-0111  
Westinghouse Electric 11 N E 6 82-3691  
Wholesale Appliance 965 S W 8 St

**ORLANDO**  
General Electric 523 N Galrand 3-6407  
Graybar Electric 533 W Central Ave 6133  
Hammond-Adams Inc 9 S Terry St 2-5833  
Radio Accessories Co 65 E Church St  
Thurow Distributors 625 W Central Ave

**PANAMA CITY**  
Thompson Appliance 6 E 4 St 6361

**PENSACOLA**  
Grice Radio & Elec 358 E Wright St 5812  
Gulf Elec & Hdwe 115 E Gregory St 6146  
Hundley Distributing 1110 N 13 Ave 5457

**ST. PETERSBURG**  
Cooper Radio Co 648 2 Ave 7-7120  
Graybar Electric 1900 1 Ave  
Southern Electronic Labs 135 1 Ave N E 77-2064  
\*Thurow Distr 342 3 Ave S  
Welch Radio Supply 408 9 St S 7-8655

**TALLAHASSEE**  
Thurow Distributors 739 Monroe St 2-1263

**TAMPA**  
Elec Supply Co 106 S Franklin St 2-3745  
General Electric 512 S Morgan 2-1805  
Graybar Electric 416 Ellamae 2-7791  
Kinkade Radio Supply 1707 Grand Central 8-6043  
Major Appliances 419 Ellamae Hdqrs Miami  
Radio Accessories Co 135 S Franklin Hdqrs Orlando  
\*Thurow Distributors 184 S Tampa St 2-1885  
Westinghouse Electric 417 Ellamae 2-5595

**WEST PALM BEACH**  
Goddard Distributors 1309 N Dixie 2-2989

**GEORGIA**

**ALBANY**  
Specialty Distributing 104 Pine Ave Hdqrs Atlanta  
Stewart's Radio 212 N Washington 1654  
Westinghouse Elec 610 N Washington 667

**ATLANTA**  
Beck & Gregg Hardware 217 W Luckie St N W WA  
2010  
Economy Auto 1130 Bankhead N W AT 1672  
Electrical Whsle 229 Whitehall St SW CY 3431  
General Electric 172 Haynes St S W MA 3811  
Georgia Appliance 1405 Spring St N W  
Graybar Electric 333 North Ave N W CY 1751  
Hopkins Equip 418 W Peachtree CY 8505  
Southeastern Radio Parts 400 W Peachtree 6-9761  
Specialty Distributing 425 Peachtree N E  
Thomas Electronics H 419 Spring N W LA 8477  
Westinghouse Elec 1299 Northside Dr N W AT 2721  
Yancey Co 1500 Northside Dr N W EL 8843

**AUGUSTA**  
General Elec 811 Marion Bldg 2-3582  
\*Prestwood Electronics 708 Reynolds St 4-5444  
Specialty Distributing 644 Reynolds St Hdqrs Atlanta

**COLUMBUS**  
\*Radio Sales 1326 1 Ave

**MACON**  
Hatcher Co A S 586 3 St 3-5464  
Specialty Distributing 539 Arch St Hdqrs Atlanta  
White Radio Co 654 Mulberry St 3-3768

**SAVANNAH**  
General Electric 301 E Bay St 4-2231  
Graybar Electric 2601 Whitaker St 2-1121  
Southeastern Radio Parts 38 Montgomery St Hdqrs  
Atlanta  
Specialty Distributing 411 E Broughton St Hdqrs  
Atlanta  
Tuten & Long 1508 E 50 St  
Westinghouse Elec 580 Indian 3-9682  
Yancey Co 666 Indian St 4-1611 Hdqrs Atlanta

**IDAHO**

**BOISE**  
\*Craddock Radio Sup 1522 State St  
General Electric 618 S 8 St 4343  
Graybar Electric 14 & Idaho Sts 6315  
\*Kopke Electronics 119 Peasley 7208  
Strevell-Paterson 408 S 9 St 4851 Hdqrs Salt Lake  
City Utah  
Westinghouse Electric 318 S Capital Blvd 2-3531

**IDAHO FALLS**  
Schwendiman Dist 380 E St 2470W

**POCATELLO**  
Billmeyer's Wholesalers 698

**ILLINOIS**

**AURORA**  
Pioneer Radio Supply 103 S La Salle St

**BELLEVILLE**  
\*Lurtz Electric 219 N Illinois St 942

**BENTON**  
\*Lampley Radio 802 N McLeansboror 105W

**BLOOMINGTON**  
Arco Electronic Supply 908 S Lee St 2-5145

**CALUMET CITY**  
Chaunceys Inc 136 Pulaski Ave Hdqrs Chicago

**CHAMPAIGN**  
Electronic Parts Co 905 S Neil St 9525

**CHICAGO**  
\*Allied Radio 833 W Jackson Blvd HA 1-6800  
\*Bowman & Co J. G. 515 E 75 St 4-8070  
Broadwin TV & Radio 5004 Broadway UP 8-6060  
\*Chaunceys Inc 4787 W Chicago ES 8-0830  
Chicago Radio Apparatus 415 S Dearborn HA 7-7276  
Chicago Radio Products 5453 S Halsted B0 8-4202  
Clayton Radio 2749 N Ashland GR 7-1075  
Concord Radio Corp 901 W Jackson Blvd HA 1-0422  
Graybar Electric 850 W Jackson Blvd CA 6-4100  
Green Mill Radio Supply 145 W 111 St PU 5-9840  
Howard Electr 3149 W Fullerton EV 4-1545



# DISTRIBUTORS SERVING the ELECTRONIC INDUSTRIES

Lukko Sales Corp 5024 Irving Park Rd AV 3-4800  
 Martin Inc J H 2614 W North Ave EV 4-6500  
 \*Midwest Electr 6907 N Western Ave RO 1-1160  
 Mort's Radio Shack 630 W Randolph St ST 2-3868  
 Nation Wide Radio 572 W Randolph St DE 2-6509  
 Newark Electric 223 W Madison St 2-2950  
 Olson Radio 623 W Randolph DE 2-5226 Hdqrs Akron Ohio  
 Pilgrim Distributing 1170 E 53 HY 3-2210  
 Pioneer Radio Supply 1921 W Belmont BU 1-8720  
 Radio Components 28 N Halsted SE 3-8811  
 \*Radio Parts Co 612 W Randolph DE 2-2530  
 Radio Parts Distr 925 E 55 St BU 8-5050  
 Radio Parts Outlet 4305 Lincoln Ave WE 5-7781  
 Radio-TV 4345 W Armitage Ave HU 9-3311  
 RCA Victor Distr 445 N Lake Shore Dr WH 4-4600  
 Star Electronic 7736 S Halsted HU 3-8440  
 Triangle Industries 600 W Adams AN 3-5060  
 \*Walker-Jimieson 311 S Western Ave CA 6-2525  
 Westinghouse Elec 113 N May TA 9-500

**DANVILLE**  
 Allen Electric 18 E North St  
 Westinghouse Electric 603 N Gilbert 1901

**DECATUR**  
 Loughnane & Co 802 N Water St 2-4187  
 York Radio & TV 801 N Broadway 3-3484

**DIXON**  
 Illinois Appliance 407 W I St

**ELGIN**  
 Elgin Electronic 157 Brook 7635  
 Fox Electric Supply 67 N State St

**EVANSTON**  
 Chaunceys Inc 1908 Central St Hdqrs Chicago

**HARRISBURG**  
 Standard Radio 523 W Poplar 640

**JACKSONVILLE**  
 Baptist Radio & TV 419 S Mauvaisterre 34

**JOLIET**  
 Joliet Radio Supply 460 N Chicago 3-9328

**KANKAKEE**  
 Radio Doctors 220 E Station St 2-4726

**MATTOON**  
 Furste Auto Supply 1617 Planter 5418

**MOLINE**  
 \*Lofgren Dist Co 1202 4 Ave MO 4-7436

**MT. CARMEL**  
 Wabash Electronics 700 Plum St 728

**OAK PARK**  
 Melvin Electronics 238 Chicago Ave VI 8-3690

**PEORIA**  
 Graybar Electric 704 S Adams PE 4-8211  
 Griffin Distributing Co 400 Franklin St  
 \*Herberger Radio Supply 136 I St  
 Klaus Radio & Electric 707 Main St  
 Peoria Elec Appl 631 Franklin 3-3847  
 Rohn Electronic 2108 Main St 4-9156  
 Warren Radio 308 S Oak St  
 Westinghouse Electric 2800 N Adams St 2-5456  
 Yeomans Distributing 3302 N Adams 5-7631

**QUINCY**  
 \*Cooper Supply 419 S 10 St 237  
 Quincy Electronic 310 Hampshire

**ROCKFORD**  
 General Electric 810 20 St 5-0551  
 H & H Electronic Supply 510 Kishwaukee St 5-4625  
 Johnson Sales Art A 1117 Charles St  
 Mid-West Associated 506 Walnut 4-5843  
 State-Wide Wholesale 800 N Wyman St  
 Westinghouse Elec Supply 323 S Main St 5-0577

**ROCK ISLAND**  
 \*Tri-City Radio Supply 1919 4 Ave 8-5681

**ST. JACOB**  
 Michael's Electrical Supply 32

**SPRINGFIELD**  
 \*Bruce Harold 120 N I St 3-5159  
 General Electric 1007 E Jefferson 3-4509  
 Sasco United Tel 217 E Washington 8-7822  
 \*Wilson Supply 108 W Jefferson

**STERLING**  
 Hardware Products 201 Locust ST 70

**TUSCOLA**  
 Moulden Distributing 106 W N Central Ave 163

**WAVERLY**  
 Hierman Radio & Electrical 396

**WHEATON**  
 Gaskins Distributor 1005 S Aurora Way

## INDIANA

**ANDERSON**  
 Seyberts Radio Supply 1331 Main St 3-5431

**ANGOLA**  
 Lakeland Radio Supply 525 S West St 70X

**BLOOMINGTON**  
 Stansifer Radio 343 S Rogers St 2-2831

**CROWN POINT**  
 \*Hub Distributors 106 N Main St 1110

**ELKHART**  
 Radio Service Hdqrs 725 S Main St 2-1208

**EVANSVILLE**  
 Castrup's Radio Supplies 1014 W Franklin St  
 Ferbend Inc S U 1901 W Maryland 5-8193  
 General Electric 422 N W 5-5274  
 Graybar Electric 1709 E Columbia St 6-1357  
 Ohio Valley Sound Service 11 N W Riverside Dr 5-9243  
 Wesco Radio Parts 428 Penn St 2-2141  
 Westinghouse Electric 201 N W I St 5-7276

**FORT WAYNE**  
 Fort Wayne Electronics Supply 223 E Main St AN 7388  
 General Electric 1609 S Calhoun St HA 3243  
 Pembleton Labs 236 E Columbia E-1812  
 Protective Elec 130 W Columbia A-9331

Van Sickle Radio 1320 S Calhoun E-4136  
 Wall Distributing 241 Pearl St  
 \*Warren Radio Co 1716 S Harrison St  
 Westinghouse Elec Supply 610 S Harrison St AN 3421

**FRANKFORD**  
 Dossett Co M H 855 Burlington 5394

**GARY**  
 Cosmopolitan Radio 524 Washington GA 7746  
 P-B Distr 3763 Broadway GA 3-5731  
 Walker-Jimieson 615 W 11 Ave Hdqrs Chicago III

**HAMMOND**  
 Broadwin Radio & TV 6516 Calumet St  
 Graybar Electric 5830 Calumet Ave SH 5830  
 Westinghouse Elec 6341 Ind Blvd RU 9400

**INDIANAPOLIS**  
 Associated Distr 210 S Meridian St LI 2593  
 General Electric Supply 826 W Ga LI 8445  
 Gibson Co 433 N Capitol Ave LI 3321  
 \*Graham Electronics 102 S Penna St LI 8488  
 Graybar Electric 1300 W 16 St AT 2351  
 Hoosier Radio Supply 701 N III St LI 3010  
 Indianapolis Radio 912 N III St LI 8970  
 Kiefer-Stewart Co 122 S Senate Ave LI 4321  
 Meunier Radio Supply 524 N Illinois St LI 8884  
 Radio Distributing 1018 N Capitol Ave PL 8311  
 Radio Equipment Co 1010 Central Ave RI 6453  
 Rodefelo Co 614 N Capital LI 8331  
 Sanborn Electric 311 N III St PL 9584  
 Warren Radio 908 N III St LI 5566 LI 8970  
 Hdqrs Toledo Ohio  
 Westinghouse Elec Supply 139 S Penna St MA 3301

**JEFFERSONVILLE**  
 Moakler Electronic 949 E Maple 2-2229

**KOKOMO**  
 George's Electronic 125 N Buckeye 6771

**LAFAYETTE**  
 Holmes Radio State Rd 25 Bypass 29-9471  
 Lafayette Radio Supply 408 E North St 5217

**LOGANSPORT**  
 Conrad Co A E RFD 4 2606

**MARION**  
 Mobile Radio Supply 507 N Washington 5734  
 Myers Radio Supply 115 W 22 St 1357

**MUNCIE**  
 General Electric 204 E Willard St 6614  
 Radio Supply of Muncie 308 Walnut  
 Standard Radio Parts 1104 S Walnut 8522

**PERU**  
 Clingaman Radio 814 W Main St  
 Television-Radio Distr 814 W Main 2005

**RICHMOND**  
 Fox Electronics 711 S 9 St 2-4676  
 Radio & TV Dist 717 S 5 St 2-4752 Hdqrs South Bend  
 Rinehart Inc 511 Main 2-2581

**SOUTH BEND**  
 Cloud Bros 110 E Western Ave 6-0395  
 Coffax Co 802 S Main 6-5548  
 Comm Sound & Radio 528 E Coffax 3-9394  
 Radio Distributing 432 S Carroll St Lafayette 6-9551  
 Radio Equipment Co 1202 S Lafayette 6-9551  
 Radio & TV Distr 116 N Hill St 3-9394

**TERRE HAUTE**  
 Archer & Evinger 1216 Wabash CR 7757  
 General Elec 801 Poular St CR 9-695  
 Terre Haute Radio 501 Ohio CR 4772  
 Walker Electric Supply 126 S 3 St

**VALPARAISO**  
 \*Bowman & Associates Jess 257 W Lincolnway 3-4381

## IOWA

**BURLINGTON**  
 Union Supply Co 409 Washington 7270

**CEDAR RAPIDS**  
 \*Gifford-Brown 106 I St S W Hdqrs Des Moines  
 Iowa Radio Supply 508 3 Ave S E 5346

**COUNCIL BLUFFS**  
 \*World Radio Labs 744 W Broadway 7795

**DAVENPORT**  
 Crescent Elec Supply 505 Pershing Ave 2-6273  
 Graybar Electric 206 E 5 St DA 3-2769  
 Havereamp Co 402 E Leust St 3-1857  
 \*Midwest-Timmerman 114 Western Ave 7-5288  
 RCA Victor Distr 1235 W 5 St 7-9189  
 Tri-City Radio Supply 320 E 4 St 3-8051  
 Union Supply Co 324 E 4 St Hdqrs Burlington  
 Westinghouse Electric 402 E 4 St 3-9996

**DES MOINES**  
 General Electric 513 E Court Ave 4-0156  
 \*Gifford-Brown Inc 1326 Walnut 3-1257  
 Graybar Electric 24 11 St 3-8614  
 \*Iowa Radio Corp 1212 Grand 2-8197  
 \*Midwest-Timmermann 812 Tuttle St Hdqrs Davenport  
 Onthank Co G W 10 & Mulberry 3-8166  
 \*Radio Trade Supply 1224 Grand 4-8909  
 Sidles Co 8 7 St 4-0138  
 Sorenson Co H E 100 S W 1 St 4-6267  
 Westinghouse Elec Supply 1400 Walnut 2-0244

**DUBUQUE**  
 \*Boe Distributing 498 N Grandview 3-5795

**FORT DODGE**  
 \*Ken-Els Radio Supply 810 N 9 WA 3880

**OTTUMWA**  
 Friday-Lynch Radio 429 W 2 7138

**SIOUX CITY**  
 Brown Radio Supply 1317 Dices St 2-3163  
 \*Duke's Radio 209 6 St 5-5056  
 \*Power City Radio 410 Jones St Hdqrs Slous Falls S D  
 Westinghouse Electric 1005 Dace St 5-7634

**WATERLOO**  
 Farnsworth Radio & TV 623 Jefferson 6682-3  
 \*Ray-Mac Supply Co 200 Ballou St 3-5296  
 Westinghouse Electric 300 W 3 St 4679

## KANSAS

**HUTCHINSON**  
 \*Interstate Electronic Supply 325 W 4 St  
 Wholesale Electronics 1019 E "A" Ave 2-4456

**KANSAS CITY**  
 RCA Victor Fairfax & Funston Rd AT 3075

**PITTSBURG**  
 Pittsburg Radio Supply 212 S Broadway 356

**SALINA**  
 \*Western Distr 227 Santa Fe

**TOPEKA**  
 \*Acme Radio Supply 412 E 10 St  
 \*Overton Electric 522 Jackson

**WICHITA**  
 \*Amateur Radio 1203 E Douglas 4-3579  
 \*Excel Distributors 118 W 2 4-4783  
 General Electric 801 E 1 St 5-0620  
 Graybar Elec 424 N Rock Island 7-1366  
 \*Interstate Elect 230 Ida 4-6318  
 \*Radio Supply Co 1125 E Douglas 7-5218  
 RCA Victor Distr 351 N Water 7-7577  
 Westinghouse Electric 233 S St Francis 3-8215

## KENTUCKY

**ASHLAND**  
 Ashland Radio Supply 2125 Winchester 3125

**BOWLING GREEN**  
 Crescent Radio Supply 212 W 10 St 9722

**HARLAN**  
 General Elec Hoskins St 815

**LEXINGTON**  
 Electronic Distr 134 W 3 St  
 General Electric 309 N Ashland Ave 2-1887  
 Ky Radio Supply 376 E Main St 2-3373  
 Lexington Electronic 338 E Main 4-3470  
 Miller's Barney 232 E Main 2-9622  
 \*Radio Equip Co 480 Skain Ave 3-1577

**LOUISVILLE**  
 Burks Co P I 911 W Broadway JA 7323  
 Ewald Distributing 309 S 9 St JA 8227  
 General Electric 2811 S Brook St CA 3651  
 Graybar Electric 624 Myrtle CA 5411  
 \*Peerless Elec Equip 2210 S 7 St CA 7678  
 R-K Distr 801 W St Catherine JA 5349  
 Universal Radio Supply 533 S 7 St JA 1413

**NEWPORT**  
 Apex Distributing 506 York St AX 1949

**OWENSBORO**  
 Centronics Inc 600 W 3 St 3-6727  
 Pearl's Elec Equip 1206 Triplett Hdqrs Louisville

**PADUCAH**  
 General Electric Co 301 S 2 St 447  
 W Ky Electronic 1205 Broadway 4503

## LOUISIANA

**ALEXANDRIA**  
 \*Central Radio Supply 509 Monroe St  
 Columbia Radio & Supply 2140 Lee Hdqrs New Orleans

**BATON ROUGE**  
 Electronic Supply 1753 N 21 St 2-0517  
 Graybar Electric 2442 T Dunham Ave 4-7093  
 La Radio TV Distr 1042 N Blvd 3-9671  
 \*R-Inh's Radio Electronic Supply 812 Main St

**LAFAYETTE**  
 Butcher Bros 438 Jefferson

**LAKE CHARLES**  
 Wholesale Radio Equip 230 Bilbo 6-5991

**MONROE**  
 C & O Electronics 500 N 3 St 3-5732  
 \*Hale & McNeil 421 Walnut 5136

**NEW ORLEANS**  
 Allen Supply Co W B 1601 Orleans Ave  
 Bell Radio Supply 2625 Tulane Ave  
 \*Columbia Radio & Supply 3940 3 St UN 2731  
 \*Crescent Radio & Supply 1600 Baronne St  
 Eco Inc 601 S Peters St  
 Electrical Supply Co 201 Magazine St  
 Electronic Parts Co 205 N Broad St  
 General Elect 4221 Bienville GA 5771  
 Graybar Electric 116 Magnolia St CA 6263  
 Interstate Electric 1001 S Peters CA 8541  
 Ole Miss Supply Co 901 Carondelet St TU 3555  
 Pee-Jay Radio 2306 Tulane Ave AU 0807  
 Radio Parts Inc 807 Howard  
 Shuler Supply 415 Dryades St RA 2166  
 \*Southern Radio Supply 1900 Tulane  
 Walther Bros Co 714 Howard CA 7731  
 Westinghouse Elec 2538 Poydras TU 5411

**SHREVEPORT**  
 Dunckelman-Pace 1417 La Ave 2-8534  
 Electronics Co 936 Milam St 3-7162  
 General Electric 4130 D-Izoff St 5-8631  
 Graybar Electric 90 Fannin St 3-3271  
 Interstate Electric Co 630 Spring St 3-6131  
 \*Koelmay Sales Co 2350 Linwood Ave  
 Westinghouse Electric 120 Caddo St 3-0583

## MAINE

**AUBURN**  
 \*Radio Supply Co 26 Cross St 4-5486

**AUGUSTA**  
 Westinghouse Electric 90 Water St 2040

# DISTRIBUTORS SERVING the ELECTRONIC INDUSTRIES

**BANGOR**  
 General Elec Supply 840 Hammond  
 Radio Serv Lab 76 Exchange Hqrs Manchester N H  
 Radio Supply Co 151 Center St hqrs Auburn  
 Westinghouse Elec Supply 175 Broad St 6487

**PORTLAND**  
 Brown Co F M 12 Free St 3-4791  
 Commercial Distributors 35 Commercial St  
 General Electric Supply 170 Anderson St 2-3721  
 Graybar Electric Center & Commercial Sts 3-1766  
 Hub Cycle & Radio 81 Franklin 2-4679  
 \*Maine Electronic 148 Anderson 4-0301  
 Radio Serv Lab 1004 Congress hqrs Manchester N H

## MARYLAND

**BALTIMORE**  
 American Distr Co 1200 N Fulton LO 8930  
 Berman Co H O 10 E Lombard LE 7002  
 D & H Distr Co 25 S Liberty SA 5100  
 General Elec 1500 Barclay LE 3565  
 Graybar Electric 100 South St SA 5050  
 \*Kann-Ellert Electronics 9 S Howard SA 4242  
 Lytron Distr Co 1338 W North Ave LA 6364  
 \*Radio Elec Serv 5 N Howard LE 9-3835  
 Spartana Co A R 239 Gay St N SA 5762  
 Westinghouse Electric 2415 W Franklin LO 4400  
 \*Wholesale Radio Parts 311 W Baltimore St  
 MU 2134

**CUMBERLAND**  
 \*Zimmerman Wholesalers 162 Bedford hqrs Hagerstown

**FREDERICK**  
 Hankey's Radio & TV 404 Elm St 1434

**HAGERSTOWN**  
 Stoddard Supply Co 354 S Cannon 2807  
 \*Zimmerman Wholesalers 114 E Washington St 408

**SALISBURY**  
 Almo Radio Co 219 Highland Ave hqrs Philadelphia Pa  
 Artercraft Elec 6151  
 Standard Electronics 7593

**SILVER SPRING**  
 Rucker Radio Wholesalers hqrs Washington D C

## MASSACHUSETTS

**BOSTON**  
 Aeme Distributors 1103 Columbus Ave HI 2-1400  
 Arvedon Distributors 73 Portland RI 2-0394  
 Brattle Radio Co 42 Brattle St CA 7-7529  
 Burke Co J H 39 Brighton Ave AL 4-4050  
 Commercial Radio 36 Brattle RI 2-1241  
 Del Padre Assoc L L hqrs Springfield  
 \*DeMambro Radio 1111 Commonwealth St 2-7870  
 Electro Sales Co 50 Eastern Ave CA 7-3456  
 General Electric 145 N Beacon AL 4-5300  
 \*Gerber Radio Supply 1900 Columbus GA 7-0411  
 Graybar Electric 287 Columbus KE 6-4567  
 \*Hatry & Young 811 Boylston St CO 7-4700  
 Herman Co L M 885 Boylston St CO 7-5620  
 Lincoln Electronic 876 Commonwealth BE 2-7510  
 \*Mayer Co A W 895 Boylston CO 7-5530  
 \*Radio Shaek 167 Washington LA 3-3700  
 Radio Wire TV 110 Federal hqrs New York City NY  
 Sager Elec Supply 201 Congress St LI 2-2281  
 Tee-Vee Supply 3211 Washington JA 2-9330  
 Westinghouse Elec 95 Brookline Ave CO 7-3100  
 Yankee Electronics 257 Huntington Ave CO 6-0212

**BROCKTON**  
 \*Ware Radio Supply 913 Centre St

**CAMBRIDGE**  
 Eastern Co 620 Memorial TR 6-4720  
 \*Electrical Supply 1739 Mass Ave KI 7-6646  
 HiFi Lab 89 Mt Auburn St TR 6-2666  
 Selden Distr Co 800 Mass Ave KI 7-0920

**FALL RIVER**  
 Ross & Co E A 341 Columbia St 3-0921

**FITCHBURG**  
 Hatry & Young 372 Water St 2-0603

**HOLYOKE**  
 Springfield Radio Co 98 High St hqrs Springfield 2-8302  
 Tel-O-Wire Sound Co 24 Newton Pl 5626

**LAWRENCE**  
 \*Hatry & Young 262 Lowell St 7171

**LOWELL**  
 McCartin Co F P 181 Market St 9751

**LYNN**  
 Des Roberts Elec 24 Mt Vernon St LY 5-0015

**MEDFORD**  
 Durrell Distr 222 Mystic Ave

**MELROSE**  
 \*Melrose Sales Co 407 Franklin ME 4-3821

**NATICK**  
 Willett Radio Supply 11 Court

**NEW BEDFORD**  
 \*Beckman Co C E 11 Commercial 6-8201  
 Ross & Co E A 1663 Purchase hqrs Fall River

**NEWTON**  
 Delta Distr 314 Washington BI 4-1560

**NORTHAMPTON**  
 C & I Automotive Supply 228 Pleasant St 4168

**PITTSFIELD**  
 \*Pittsfield Radio 41 West St

**SPRINGFIELD**  
 \*Cushing T F 349 Worthington St  
 Del Padre Assoc L L 236 Chestnut 9-5658  
 General Electric 484 Worthington 4-8255  
 Graybar Electric 32 Patton 7-4373  
 \*Hatry & Young 169 Spring St 6-3833  
 N E Service Center 891 State St 9-4754  
 Regent Sales 236 Chestnut St

\*Soundco Electronic 147 Dwight 7-3425  
 Spinney Co B H 153 Plainfield ST 4-8284  
 \*Springfield Radio 405 Dwight ST 2-3411  
 Tarbell-Watters 144 Chestnut 6-1841  
 Western Mass Distr 1 Belmont Ave 6-6374  
 Westinghouse Elec 46 Hampden 4-3101

**TAUNTON**  
 \*Dean & Co D B 85 Cohannet St TA 4-4117

**WORCESTER**  
 \*DeMambro Radio Supply 222 Summer St hqrs Boston  
 General Elec 163 Mechanic 6-4351  
 Graybar Electric 108 Grove 6-4311  
 Johnson Electronic 12 E Worcester St  
 \*Radio Electronic Sales 52 Chandler St  
 \*Radio Maint Supply 80 Thomas St 6-8311  
 Westinghouse Elec 107 Thomas St 7-5641

## MICHIGAN

**ANN ARBOR**  
 Purchase Radio 605 Church 8696  
 \*Wedemeyer Electronic 214 N 4 Ave 2-4457

**BATTLE CREEK**  
 \*Electronic Supply 94 Hamblin 2-9515

**BAY CITY**  
 Kinde Distr Co 504 Washington St

**BENTON HARBOR**  
 Benton Electronic 643 W Main 5-1373



Radio & TV Distr Co 311 Mich St

**CHEBOYGAN**  
 \*Straits Distributors 412 N Main St 968

**DETROIT**  
 Duffy & Co M N 2040 Grand River W0 3-2270  
 Falk Distr Co 9339 Grand River TE 4-0625  
 \*Ferguson Radio 622 W Baltimore TR 4-0100  
 General Elec 680 Antoinette St TR 5-9400  
 Glendale Supply Co 12866 Woodward Ave TU 3-1500  
 Graybar Electric 55 W Canfield Ave TE 1-5500  
 Hi-Park Distrs 155 La Belle Ave  
 \*KLA Labs 7422 Woodward TR 4-1100  
 Mercury Distr Co 3727 Woodward TE 2-7720  
 Perkins Sales 20480 Woodward TO 8-7020  
 RCA Victor Distr 7400 Intervale TE 4-3500  
 Radio Electronic 1112 W Warren TE 2-5611  
 \*Radio Specialties 456 Charlotte TE 2-7578  
 Radio Supply 85 Selden TE 1-3171  
 \*Rissi Electronic 1112 W Warren TE 2-5611  
 Westinghouse Electric 2211 W Kirby TE 8-9000  
 \*West Side Radio 8140 Mich LU 4-0120

**ESCANABA**  
 Felton Radio 1617 Ludington 2855

**FLINT**  
 Graybar Electric 2424 Kansas 2-4101  
 \*Lifsey Distr Co 726 N Saginaw  
 Radio Tube Merch Co 508 Clifford 4-3654  
 \*Shand Radio Spec 208 W Kearsley St 2-9714  
 Westinghouse Electric 2330 N Dort H'way 4-8623

**GRAND RAPIDS**  
 Bursma Radio Supply 853 Grandville 5-9780  
 General Electric 305 Fulton St W 9-3243  
 Graybar Electric 432 Monroe Ave N W 8-1231  
 Perkins Sales Co 12 Oakes S W hqrs Detroit  
 \*Radio Electronic 505 Jefferson S E 9-4611  
 Radio Equip Co 13 Ionia Ave S W hqrs South Bend Ind  
 Radio Parts Inc 720 Division S 5-5420  
 Westinghouse Elec 511 Monroe Ave N W 9-4664  
 Wholesale Radio Co 24 Logan S W GL 6-1432

**JACKSON**  
 \*Fulton Radio 1208 Greenwood 4-6107

**KALAMAZOO**  
 Electronic Supply 906 E Mich Ave hqrs Battle Creek  
 General Electric 112 Parkway 3-2645  
 Ralston Co R M 201 N Park St 5-0188  
 \*Warren Radio 713 Portage St

**LANSING**  
 \*Elec Product Sales 427 E Mich Ave 24-123  
 General Elec Supply 428 N Grand 2-0677  
 Graybar Electric 241 E Elm St 4-5434  
 Morley Bros 1330 S Harrison  
 \*Offenhauer Co 227 W Washentaw 2-9896  
 \*Wedemeyer Electronic 800 Merrill St 7-088 hqrs Ann Arbor

**LAURIM**  
 \*Northwest Radio 435 Tamarack 797

**MANISTEE**  
 Gardner Radio 2861 Lakeshore Rd 1260-W2

**MUSKEGON**  
 Bell-Lourim 1839 Peck St 2-6019  
 Bursma Radio 712 E Isabella hqrs Grand Rapids  
 \*Fitzpatrick Elec 444 Irwin 2-6621

**MUSKEGON HEIGHTS**  
 Western Electronic 517 W Broadway 3-1639

**PONTIAC**  
 \*Electronic Supply 248 E Pike

**PORT HURON**  
 Main TV Supply 1340 Lapeer Ave 5103

**SAGINAW**  
 General Elec 125 Davenport St 3-6474  
 Morley Bros 115 N Washington  
 Orem Distributing 801 E Genesee  
 \*Radio Parts Co Water & Millard Sts  
 Saginaw York Refr 1751 E Genesee Ave 3-5444

## MINNESOTA

**AUSTIN**  
 Radio Elec 219 N Franklin 7-4214 hqrs Minneapolis

**DULUTH**  
 Bonn Co Lew 228 E Superior hqrs Minneapolis  
 General Electric 102 W Mich St 2-0826  
 Graybar Electric 820 W 1 St 2-6646  
 \*Northwest Radio 123 E 1 St  
 Popkey G M 206 E 1 St  
 Stark Radio Supply 109 Lake Ave S  
 Westinghouse Elec 230 Lake Ave S ME 2-2623

**HOPKINS**  
 Wolter Electronic Co 710 Ave N HO 3632 hqrs Fargo N Dak

**MANKATO**  
 Southern Minn Supply 4501

**MINNEAPOLIS**  
 \*Bauman Co 3033 Lyndale Ave S GI 1745  
 \*Bonn Co Lew 1211 La Salle FI 6351  
 \*Electronic Center 107 3 Ave N LI 8678  
 General Electric 63 S 13 St BR 3266  
 Graybar Electric 824 S 4 St GE 1621  
 Hayer Co F C 250 3 Ave N MA 2501  
 Larson Elec J H 114 Glenwood hqrs Hudson Wis  
 National Electronics 1215 Nicollet BR 2185  
 Northwest Radio 52 S 12 St BR 5173  
 Radio Elec Supply 2451 Nicollet GE 7733  
 Reinhard Bros 11 S 9 St K GE 2681  
 \*Stark Radio Supply 71 S 12 St GE 4623  
 Sterling Electric 33 S 5 Ave MA 4571  
 Westinghouse Electric 515 S 7 St LI 7001

**ROCHESTER**  
 Elliott & Hanson 13 4 St S W 2-2779  
 Southern Minn Supply

**ST. PAUL**  
 Bonn Co Lew 141 W 7 St hqrs Minneapolis  
 \*Electronic Distr 856 Raymond PR 3911  
 General Electric 174 E 6 St GA 7801  
 Graybar Electric 464 Robert St CE 7491  
 \*Hall Electric Co 566 N Robert St GA 5696  
 Northwest Radio & Electronic 194 W 4 St hqrs Minneapolis

Stark Radio Supply Co 250 W Kellogg Blvd  
 CE 1994  
 Westinghouse Electric 253 E 4 St GA 7441

**WADENA**  
 Central Co-op Wholesale hqrs Superior Wis

## MISSISSIPPI

**BILOXI**  
 Nelson Radio Supply 816 W Howard

**GREENVILLE**  
 Goyer Supply Co Box 652

**JACKSON**  
 \*Cabell Elec Co 422 S Farish 2-2624  
 Ellington Radio 3-1327  
 General Electric 610 Gesco PI 2-5041  
 Graybar Elec 2-3616  
 Industrial Supplies Highway 80  
 Radio & TV Supply Co 328 N West St  
 Ryan Supply Co 208 S State St 5-2241  
 Southern Distributors 1400 Terry Rd  
 Swan Distr Co 342 N Gallatin 2-5516  
 Westinghouse Elect 325 S Farish 4-8354

**MERIDIAN**  
 Griffin Radio Supply 2511 8 St  
 Radio Supply Co 909 24 Ave 8802  
 Ryan Supply Co 814 21 N E

## MISSOURI

**BUTLER**  
 Henry Radio Co 211 N Main St 395

**CAPE GIRARDEAU**  
 General Electric 402 S Sprigg 805  
 \*Suedekum Electronic 902 S Sprigg 5-3757

**JEFFERSON CITY**  
 \*Central Mo Distr Co 324 E Capital Ave

**JOPLIN**  
 \*Brotherson Co M 515 N Byers Ave 1596  
 \*Four States Radio 201 Main St  
 General Electric 922 Penna Ave 5622

**KANSAS CITY**  
 \*Burstin-Applebee 1012 McGee St BA 1155  
 Columbian Elec 2603 Grand Ave GR 1001  
 Gaines & Co J G 1730 Grand BA 4-8888  
 General Elec 2101 Broadway HA 7447  
 \*Henshaw Radio 3617 Troost Ave WE 5550  
 \*Manhattan Radio & Equip 1732 Grand Ave VI 9776  
 \*McGee Radio & Electric 1422 Grand Ave VI 9045  
 RCA Victor Distr Corp 2113 Broadway HA 0300  
 Radiolab 1612 Grand Ave HA 0171  
 \*Walter's Radio Supply 3645 Main St

**POPLAR BLUFF**  
 \*Tri-State Radio 536 E Pine Blvd 2821

**ST. JOSEPH**  
 \*Acme Radio Supply 110 N 9 St  
 American Electric Co 116 N 4 St  
 \*St Joseph Radio 922 Francis St

**ST. LOUIS**  
 \*Ashe Radio Co Walter 1125 Pine CH 1125  
 Brightman Distr 4421 Ridgewood SW 7575  
 Brown Radio Co Tom 3924 Washington St NE 2259  
 \*Ebinger Radio 2501 S Jefferson MO 7700

# DISTRIBUTORS SERVING the ELECTRONIC INDUSTRIES

General Elec Supply 2653 Locust St NE 3000  
 Gordon Radio 1118 Pine St CE 4777  
 Graybar Electric 2642 Washington Ave NE 4700  
 Hollander & Co 3900 W Pine FR 6412  
 \*Interstate Supply 24 S 10 St CH 2325  
 Napper Radio 3117 Wash Blvd  
 Phone Craft Co 427 N Euclid RO 3147  
 \*Radonics 5040 Easton Ave RO 7311  
 Toler Radio Ralph 4855 Easton Ave RO 9169  
 \*Van Sickle Radio 1113 Pine St CH 1814  
 Westinghouse Elec 5049 Fyler SW 2000

**SPRINGFIELD**  
 Gaines & Co J G 351 Boonville hdqrs Kansas City  
 General Elec 1301 W Webster 2-1722  
 \*Reed Radio Supply Harry 805 Boonville  
 Stout Radio Supply 700 Boonville 2-9444

## MONTANA

**BILLINGS**  
 Central Distr Co P O Box 1551 8447  
 Electronic Supply 214 11 St W 2-2727  
 General Elec 2710 Montana Ave 9-4559  
 Marshall-Wells Co  
 Northwestern Auto 420 N Broadway 3146

**BUTTE**  
 General Electric 900 E Front St 2-2314  
 Graybar Electric 604 E Aluminum St 3233  
 Smitty's Electronics 126 W Broadway  
 Westinghouse Electric 949 S Montana St 2-1269

**GREAT FALLS**  
 Lindgren Co Geo 16 4 St N W 8721  
 Smith Supply Co 114 1 Ave N

**MISSOULA**  
 Northwest Distr 509 S Higgins 4311

## NEBRASKA

**LINCOLN**  
 General Radio & TV 322 S 12 St 2-6000  
 \*Hicks Radio Co 1422 "0" St 2-7561  
 \*Leuck Radio Supply 243 S 11 St

**OMAHA**  
 Alco Radio 4011 1/2 Cuming St WA 8461  
 Bi-State Distr Corp 911 Douglas St  
 General Elec Supply 914 N 18 St JA 0456  
 Graybar Electric 1120 Capitol Ave AT 5740  
 \*JB Distr Co 1616 Cass St AT 5525  
 Noll Co H C 2226 Harney St  
 Omaha Appl 18 & St Mary's AT 3440  
 \*Radio Equip Co 2852 Douglas AT 770  
 Sidles Co 502 S 19 St WE 8400  
 Westinghouse Elec 117 N 13 HA 8700

**SCOTT'S BLUFF**  
 Joachim Radio 1913 Broadway 109

**YORK**  
 Radio Supply 110 E 7 37

## NEVADA

**LAS VEGAS**  
 Metcalf's Radio 819 Ogden 5585  
 Saviers Elec Prod 101 E Charleston hdqrs Reno

**RENO**  
 Osborne & Dermody 255 Chestnut St  
 Saviers Elec Prod 640 Sierra St 2-9134

## NEW HAMPSHIRE

**CONCORD**  
 \*Evans Radio 10 Hills Ave 1702

**DOVER**  
 \*American Radio Corp 510 Central Ave 404

**MANCHESTER**  
 \*DeMambro Radio Supply 1308 Elm St 4-4006  
 hdqrs Boston Mass  
 General Elec 57 Bedford 5-5418  
 Graybar Electric 103 Hampshire Lane 4-4341  
 \*Radio Serv Lab 670 Chestnut 5-5444  
 Westinghouse Electric 147 Hanover 5-5456

## NEW JERSEY

**ATLANTIC CITY**  
 Almo Radio Co 4401 Ventnor Ave hdqrs Philadelphia Pa  
 \*Kearns Inc Harrisburg & Atlantic AT 5-3233  
 M & H Sporting Goods hdqrs Philadelphia Pa  
 \*Radio Elec Serv 406 N Albany Ave hdqrs Camden

**BRIDGETON**  
 \*Joe's Radio Shop 67 S Pearl 251

**CAMDEN**  
 Almo Radio Co 1133 Haddon Ave hdqrs Philadelphia Pa  
 General Radio 600 Penn St WO 4-8393  
 Radio Elec Service 513 Cooper St WO 4-2830

**CLIFFSIDE**  
 Nidisco hdqrs Jersey City

**CLIFTON**  
 Eastern Radio 1055 Main Ave GR 3-6765

**COLUMBIA**  
 Columbia Distr Route 8 PO 42

**EAST ORANGE**  
 \*International Distr 185 Central OR 1927

**ELIZABETH**  
 Jersey Radio-TV Supply 1068 Elizabeth Ave

**HACKENSACK**  
 American Distr 115 Hudson St hdqrs North Bergen  
 Nidisco hdqrs Jersey City  
 Trade Radio Sales 14 Essex St HU 7-5512

**HIGHLAND PARK**  
 Park Electr Rt 37-Lincoln Hwy KI 5-3363

**HILLSIDE**  
 Sherwood Distr 1255 Liberty Ave EL 2-1126

**JERSEY CITY**  
 General Electric 157 Tonnele Ave JO 2-3620  
 \*Hallmark Electric 592 Communipaw DE 2-9696  
 Nidisco 713 Newark JO 2-2360

**LYNDHURST**  
 Economy Electronics 624 Ridge Rd RU 2-7418

**NEWARK**  
 All-State Distr 457 Chancellor WA 3-4900  
 Apollo Distr Co 15 Shipman MI 2-7266  
 \*Continental Sales 521 Bloomfield HU 2-8223  
 Electronic Marketers 415 Halsey St MA 3-2516  
 Electronic Supply 1020 Broad St  
 \*Federated Purchaser 114 Hudson MA 3-9035 hdqrs New York N Y  
 General Elec 221 Frelinghuysen BI 2-1600  
 Graybar Electric 2 Liberty St MA 2-5100  
 Gross Distr Co 49 Edison PI MA 2-8028  
 Igoe Bros 35 Halsey St MI 3-9135  
 \*Krich-New Jersey 428 Elizabeth BI 8-7408  
 \*Lippman & Co Aaron 99 Newark St MA 3-9477  
 Mytelka & Rose 1020 Broad MA 3-6272  
 O'Loughlin & Co T A 88 Washington St MI 3-8200  
 Pyramid Supply 343 W Market MA 3-7800  
 Radio Wire Television 24 Central hdqrs New York NY  
 Schultz & Sons H 620 Market MI 3-7400  
 Variety Electric 468 Broad MA 2-6760  
 Westinghouse Elec Supply 528 Ferry MI 2-3450

**NEW BRUNSWICK**  
 William Radio 1861 Woodbridge CH 7-4908

**NORTH BERGEN**  
 American Distr 6335 Hudson Blvd UN 5-8027

**PATERSON**  
 General Elec 561 E 31 St LA 5-5100  
 \*Jersey Electronic 301 Grand LA 5-3134  
 Trade Radio Sals 780 E 18 St hdqrs Hackensack

**PERTH AMBOY**  
 Bennett's Radio 327 Maple St PE 4-1736

**PHILLIPSBURG**  
 \*Williams Co C B 154 S Main St 5-1245

**PITMAN**  
 Kearns Inc 466 W Holly hdqrs Atlantic City

**PLAINFIELD**  
 Union TV Parts 403 Watchung Ave PL 4-6930

**RED BANK**  
 Monmouth Radio 404 Shrewsbury RB 6-3300

**RIDGEFIELD PARK**  
 NRM Wholesale Radio 284 Teaneck Rd HU 7-0715

**TEANECK**  
 Ross Homer M 367 Queen Anne Rd TE 6-5331

**TRENTON**  
 Allen & Hurley 23 S Warren 3-0386  
 Cooper Sales 109 Factory TR 2-8008  
 Fineburg's 547 S Broad TR 4-5125  
 General Elec Supply Brunswick Ave Ext TR 3-9865  
 Nidisco hdqrs Jersey City  
 Westinghouse Electric 745 E State TR 5-5421

**VINELAND**  
 Kearns Inc 29 S Delsea Dr hdqrs Atlantic City

**ALBUQUERQUE**  
 General Electric 820 N 1 6443  
 Midland Specialty 1624 N 1 St  
 Miller Supply 211 W Coal Ave 2-3450  
 Radio Equip Co 523 S Central St  
 Walker Radio L B 114 W Granite St  
 Westinghouse Electric 816 1 St N W 3-3708

**ROSWELL**  
 Supreme Radio 129 W 2 St 148

**SANTA FE**  
 A-1 Communications 110 W Palace Avc

**NEW YORK**

**ALBANY**  
 Albany Garage 28 Howard  
 \*Ft Orange Radio 904 Broadway 5-1594  
 Graybar Electric 40 Van Woert 5-1564  
 R T A Distrs 36 Broadway PR 5-7346  
 Taylor Co E E 465 Central 2-3860  
 Westinghouse Electric 19 R R Ave 8-7801

**AMSTERDAM**  
 \*Adirondack Radio Supply 32 Guy Park

**AUBURN**  
 Dare Radio 22 Genesee 2-0441  
 Roberts & O'Brien 191 Hardenbergh Ave

**BAYSHORE** See Long Island

**BELLROSE** See Long Island

**BINGHAMTON**  
 \*Federal Radio 188 State 2-2394  
 Morris Distr 195 Water 4-2461

**BUFFALO**  
 Bergman Co W Oak & Eagle MO 6300  
 Buffalo Radio 219 E Genesee WA 9004  
 \*Dymac Inc 2329 Main PA 2300  
 General Electric 960 Busti EL 5100  
 \*Genesee Radio & Parts 205E Genesee CL 1970  
 Graybar Electric 180 Perry WA 3700  
 Huron Supply 119 W Willow MO 6845  
 Niagara Falls Radio 147 Genesee  
 RCA Victor Dist 1209 Broadway FI 1209  
 Radio Elec Prods 186 E Genesee CL 6457  
 Radio Equipment 147 Genesee MA 9676  
 Rains Co W E 11 W North GR 4944  
 Scheller Radio 269 Oak MA 3081  
 Standard Elect 1497 Main GA 5000  
 Strauss Co Joseph 25 High SU 8080  
 Summit Distrs 916 Main GR 3100

**CORTLAND**  
 Winchell Radio 37 Central 1600

**ELMIRA**  
 \*Harrison Co F C 108 W Church 7921  
 LeVatley-McLeon-Kincaid 215 E Church

**FARMINGDALE** See Long Island

**FLUSHING** See Long Island

**FREDONIA**  
 Barker-Higbee 27 Water 2-8666

**GLENS FALLS**  
 \*Ray Distr 284 Glen 2-1017

**GLOVERSVILLE**  
 Fulton County Dist 16 Bleeker 5-2515

**GREAT NECK** See Long Island

**HEMPSTEAD** See Long Island

**HICKSVILLE** See Long Island

**HORNELL**  
 Hornell Elec Motor 45 Union 2451

**ITHACA**  
 \*Stallman of Ithaca 123 S Tioga 4-2297

**JACKSON HEIGHTS** See Long Island

**JAMAICA** See Long Island

**JAMESTOWN**  
 Johnson Radio 119 Hunt Rd 8-916  
 Warren Radio 31 Forest 2-8185

**JOHNSON CITY**  
 Westinghouse Elec 419 Grand Ave 9-1561

**KINGSTON**  
 \*Arace Electronics 25 Henry

**MALONE**  
 Vermont Hdw hdqrs Burlington Vt

**MIDDLETOWN**  
 Artec Distr 17 Cottage 3173  
 \*Certified Radio Route 84 MI 2-1055  
 Roskin Bros 27 W Main

**MINEOLA** See Long Island

**MOUNT VERNON**  
 Davis Radio 66 E 3 MO 8-6801  
 Radelco Inc 246 W 1 MO 8-6173

**NEWBURGH**  
 Chief Electronics Hdqrs Poughkeepsie  
 Westinghouse Electric 26 Liberty 5420

**NEW YORK CITY, BRONX & STATEN ISLAND**  
 Adson Radio & Elec 221 Fulton BA 7-3629  
 Arrow Electronics 82 Cortlandt DI 9-4714  
 B & D Distr 639 Tompkins Staten Island GI 7-2660  
 Bonafide Radio 89 1/2 Cortlandt WO 2-5960  
 Bronx Whsc Radio 470 E Fordham Rd FO 4-4662  
 \*Bruno-New York 460 W 34 LO 4-2425  
 Budco Distr 6 E 175 CY 9-6800  
 Calvert Elec 59 4 OR 4-3027  
 Commercial Radio-Sound 231 E 47 PL 9-5100  
 Concord Radio 55 Vesey DI 9-1133  
 Consolidated Radio 768 Amsterdam AC 2-2678  
 Dale Distr Co 40 E 32 MU 9-5252  
 Dallas Inc H L 175 Varick AL 5-3000  
 Dorfman Co L E 40 E 32 MU 9-5252  
 Dorsin Distr 10 W 13 OR 6765  
 DuMont Labs Allen B 1114 1 TE 8-8100  
 Edlie Elect 154 Greenwich DI 9-3143  
 Electronic Expeditors 507 5 Ave MU 7-0084  
 Electronic Wholesalers 5047 Broadway LO 9-4906  
 Emerson-N Y Inc 111 8 Ave WA 9-2264  
 \*Federated Purchaser 66 Dey St DI 9-3050  
 \*Fischer Distr 118 Duane St BA 7-1511  
 \*Fordham Radio 5669 Broadway  
 General Electric 585 Hudson AL 5-3300  
 Graybar Electric 420 Lexington LE 2-4000  
 Greylock Electronics 115 Liberty BE 3-0224  
 Harrison Radio 225 Greenwich BA 7-7777  
 Harvey Radio 103 W 43 LU 2-1500  
 Hobb Electrical 541 W 34 St LA 4-9200  
 Hoffman Elect 253 E 72 RH 4-0400  
 \*Hudson Radio & TV 48 W 48 CI 6-4060  
 HuGo- Radio & TV 1275 Webster LU 8-0991  
 Latham & Co E B 250 4 Ave AL 4-2200  
 \*Leonard Radio 69 Cortlandt CO 7-0315  
 Magic-Vue TV 323 E 13 St OR 4-4320  
 Midway Radio 60 W 45 MU 7-5053  
 \*Milo Radio & Electronics 200 Greenwich BE 3-2980  
 National Radio 1348 Southern Blvd DA 8-8800  
 North Radio 172 Washington CO 7-1430  
 O & W Radio 141 Cedar CO 7-2635  
 \*Powell Radio 142 W 169 CY 3-2623  
 Radio Wire TV 100 6 Ave RE 2-8600  
 Royal-Eastern Elec & Supply 38 W 21 CH 2-3200  
 \*Sanford Elect 157 Chambers DI 9-0550  
 \*Slate & Co 2755 Webster LU 4-0614  
 Sonocraft Corp 115 W 45 LU 2-1750  
 \*Stan-Burn Radio 1697 Broadway CO 5-8138  
 Sun Radio & Electronics 650 6 Ave OR 5-8600  
 \*Sylvan-Wellington 269 Canal CA 6-5811  
 \*Terminal Radio 85 Cortlandt WO 4-3311  
 \*United Radio 47 W 63 EN 2-9695  
 Western International Co 45 Vesey DI 9-2276  
 Westinghouse Electric 40 Wall WH 3-1947  
 \*Wilco Radio 383 E 138 MO 9-1654

**LONG ISLAND**

**BROOKLYN N Y**  
 Ace Electronics 2610 E16 St NJ 8-5212  
 Acme Electronics 74 Willoughby TR 5-3833  
 Bay Electronic 2712 Ave U DE 2-7171  
 Benray Electronics 485 Coney Island BU 7-9650  
 Brooklyn HiFi Sound Center 2128 Catow Ave BU 2-5300  
 \*Buchman Radio 492 Atlantic UL 5-5143  
 Electronic Equip 2912 Atlantic TA 7-6300  
 General Electric 135 Kent EV 7-1020  
 \*Green Tele-Radio 472 Sutter HY 5-0200  
 Hygrade Electronics 1509 E N Y HY 4-9237  
 \*National Radio 572 Albany PR 8-0800  
 Osbahr Co 206 8 Ave  
 Pearlless Electronics 76 Willoughby TR 5-3833  
 \*Stan Burn Radio 558 Coney Island UL 3-0700

**BAY SHORE**  
 L I Electronic Supply 226 E Main St

**BELLEROSE**  
 Teleparts of Long Island 241-21, Braddock Ave FI 3-8212

# DISTRIBUTORS SERVING the ELECTRONIC INDUSTRIES

**FARMINGDALE**  
\*Strong Television 286 Main St FA 2-2004

**FLUSHING**  
\*Melville Radio Hdqrs White Plains

**FOREST HILLS**  
Berger Distr 109-01 72 Rd

**GREAT NECK**  
Rotary Electronic 10 Grace Ave GR 2-0902

**HEMPSTEAD**  
\*Davis Electronics 204 Main St HE 2-9200  
\*Island Radio 412 Fulton HE 2-1097  
\*Standard Parts 277 N Franklin HE 2-3131  
Westinghouse Elec 42 Chasner HE 2-1816

**HICKSVILLE**  
Gem Electronics Distr 236 Broadway HI 3-3400  
General Electric 4 & Bway HI 3-1890

**JACKSON HEIGHTS**  
\*National Radio Distr 73-20 Northern Blvd HA 6-0040

**JAMAICA**  
\*Chanrose Radio 170-16 Jamaica 0L 8-2900  
Electronic Maintenance 172-24 Jamaica Ave JA 3-2870  
Harrison Radio Corp 172-31 Hillside Ave RE 9-4102  
Hdqs New York N Y  
\*Norman Radio 94-29 Merrick Rd RE 9-4651  
Peerless Radio Distr 92-32 Merrick Rd RE 9-6080

**LONG ISLAND CITY**  
Electronic Supply 41-08 Greenpoint ST 6-2730  
Graybar Electric 21-15 Bridge Plaza EX 2-2000  
Philco Distr 47-51 33 St ST 6-8400  
Westinghouse Elec 29-50 Northern Blvd HU 6-7700

**MINEOLA**  
Emerson-Long Island Inc GA 7-1506

**NIAGARA FALLS**  
General Electric 11 & Whitney 6921  
Niagara Falls Radio 1363 Pierce N 1-5531  
Niagara Radio & Parts 1518 Main

**ONEONTA**  
Grouch Distr 202 Main 2596

**PEEKSKILL**  
B & B Electronics 1607 Main  
General Electric 1000 N Division 7-1601

**PORT CHESTER**  
Ratec Inc 140 Irving PC 5-0051

**POUGHKEEPSIE**  
\*Chief Electronics 104 Main P0 7300  
Mid-Hudson Elec 999 Dutchess Tpke P0 4780  
Victory Specialties 6 Raymond 7247

**ROCHESTER**  
Bieckford Bros 208 St Paul BA 7300  
Erskine-Healy 420 St Paul L0 7980  
General Electric 67 Mortimer HA 7500  
Graybar Electric 186 N Water BA 7700  
Hunter Electronics 233 E BA 8110  
Kemp Equipment 57 Mt Hope HA 8050  
Masline Radio 192 Clinton N HA 0790  
RCA Victor Distr 208 St Paul L0 4180  
\*Rochester Radio 114 St Paul L0 9900  
Westinghouse Electric 1048 University M0 1635

**SARANAG LAKE**  
Starks & Co G L 8 Woodruff Ave

**SCHENECTADY**  
\*Electric City Radio 1566 State  
Schwartz & Son Maurice 710 Broadway

**SYRACUSE**  
Baldwin-Hall Co 475 Oswego 3-5103  
\*Berndt Co W E 655 S Warren 2-3385  
Broome Distributing 100 Tutley 75-3176  
City Electric 514 W Genesee 3-5171  
Graybar Electric 327 N West 2-1281  
Karl-William Co 404 S Crouse 75-2755  
Lincoln Supply 109 Otisoe 4-3170  
Morris Distr 1153 W Fayette 75-9957  
Onondaga Supply 344 W Genesee 74-1251  
Paul-Jeffrey Co 519 Erie E 75-4126  
Penfield Mfg 516 Erie 75-4154  
\*Radio Supply 200 Walton 3-3197  
Reliance Distr 343 W Jefferson 75-2157  
\*Roberts & O'Brien 714 Park 2-0421  
\*Smith Inc S W 325 E Water 2-7768  
Stage Roy C 265 Erie Blvd W 2-8686  
Syracuse Radio 620 S Salina 74-2927  
Syracuse TV Accessory 217 W Willow 74-3978  
Thelsen Inc 935 Erie E 75-4126  
Westinghouse Electric 961 W Genesee 74-3331

**TROY**  
McRae & Co H A 157 River AS 2-8720  
\*Trojan Radio 420 River AS 4-4481

**UTICA**  
\*Beacon Electronics 411 Columbia St 3-2304  
\*Electronic Lab 1415 Oriskany W  
Miller Electric 11 Hopper St  
Vaeth Electric 35 Genesee 2-5177  
Westinghouse Elec 112 N Genesee St 4-8116

**WATERTOWN**  
Beacon Electronics Hdqrs Utica  
Westinghouse Electric 245 State 6527

**WHITE PLAINS**  
Emerson Radio 285 Mamaroneck WH 6-3816  
\*Melville Radio 259 Mamaroneck WH 8-6131  
\*Westchester Elec 420 Mamaroneck WH 9-5766

**YONKERS**  
Yonkers Elec 541 Nepperhan Y0 9-6044

## NORTH CAROLINA

**ASHEVILLE**  
\*Freck Radio Supply 38 Biltmore Ave 3-3631  
General Electric 47 Ranklin 2-3517  
Graybar Electric 221 Patton Ave 3-4761  
\*Longs Distr 12 Biltmore Ave

**CHARLOTTE**  
\*Dixie Radio 715 W Morehead  
General Electric 700 Tuckaseegee 5-7321  
Graybar Electric 120 W Morehead 6-4886  
\*Radiotronics Distr 208 N College 2-1258

Shaw Distr 205 W 1 3-7187  
Southern Radio 1625 W Morehead 6-4461  
Walker-Martin 451 Atonda Hdqrs Raleigh  
Westinghouse Electric 324 N College 5-3715

**DURHAM**  
Graybar Electric 303 S Duke 2-113  
Womack Electric Supply 304 S Dillard

**FAYETTEVILLE**  
Dugan Radio Supply 130 Franklin  
Eastern Radio 532 Hay 2-7161

**GASTONIA**  
Bryant Supply 605 E Franklyn 5-3466

**GOLDSBORO**  
Signal Radio Kinston Hwy 1535-R

**GREENSBORO**  
General Electric 1111 Willowbrook 38208  
\*Johannesen Elec 312 N Eugene 3-6906  
\*Southeastern Radio Hdqrs Raleigh  
Walker-Martin Inc 827 Raleigh Hdqrs Raleigh  
Westinghouse Elect 1410 Westover Ter 3-8661

**GREENVILLE**  
General Electric 200 Hooker

**RALEIGH**  
General Electric 800 W Poole 3-4691  
\*Southeastern Radio 414 Hillsboro 3-1936  
Walker-Martin P O Box 391 LD 950  
Westinghouse Electric 319 3-4841

**WASHINGTON**  
Jowdy Distributing 40



**WILMINGTON**  
French Radio 1220 Dock 9878

**WINSTON SALEM**  
\*Dalton-Hege 924 W 4 2-5141  
Graybar Electric 955 Carroll J 4-2461  
Leonard Electronic Supply 409 W End Blvd  
Williams Radio C R 211 S Liberty

**NORTH DAKOTA**

**FARGO**  
\*Bristol Distr 419 Northern Pacific 5851  
Dakota Electric 1017 4 N 2-3301  
Hayer F C Box 1657 9310  
Radio Equipment 624 2 5462  
Westinghouse Elec 109 Roberts 2-4446  
Wolter Electronics 65 5 St N 4886

## OHIO

**AKRON**  
Akron Radio/TV Parts 75 N Case Ave RE 2717  
General Electric 225 E Mill FR 8195  
Graybar Electric 185 Carroll JE 4-4143  
Main TV Supply 1013 N Main St WA 2117  
Olson Radio 73 E Mill St JE 9191  
Saeks Electrical 605 S Main St JE 8196  
Strong-Carlisle-Hammond 422 S Broadway Hdqrs  
Cleveland  
\*Sun Radio 110 E Market St HE 2171  
\*Warren Radio 71 S Broadway

**ASHTABULA**  
\*Morrison's Radio 331 Center St 39-936

**CANTON**  
Armstrong Electr Center 1261 Cleveland N  
\*Burroughs Radio 711 2 St NW 5-0273  
Fall Radio Supply 410 Arlington Ave NW 5-8451  
General Electric 123 6 St SW 4-5187  
Sommer Electric 818 3 St NE 5-9454

**CHILICOTHE**  
Chillicothe Hardware 21 E 2 St 2136

**CINCINNATI**  
\*Chambers Electronic 1669 Central Pkwy MA 7616  
General Electric 215 W 3 St GA 1750  
Graybar Electric 115 W McKicken MA 0600  
Herringer Distr 15 & Vine Sts CH 7273  
Holub & Hogg 1400 Sycamore St CH 7974  
\*Hughes-Peters 1128 Sycamore St DU 8433  
Mytronic 121 W Central Pkwy GA 2245  
Ohio Appl 804 Sycamore St DU 5430  
Radio/TV & Refr 1129 Walnut MA 2940  
\*Schuster Electric 321 E 8 St CH 7610  
\*Steinbergs 633 Walnut St CH 1880  
Teletronic Supply 3935 Montgomery Rd  
United Radio 1314 Vine St CH 6530  
Westinghouse Elect 3011 Stanton CA 1300

**CLEVELAND**  
Broadway Electric 6209 Broadway DI 1-8500  
Carnegie Radio Distr 2536 Prospect Ave CH1-2433  
Euclid Radio 16379 Euclid GL 1-1375  
Freshman Chas 4019 Prospect EX 1-8723  
General Electric 4958 Woodland Ave HE 1-7280  
Goldhamer 2239 E 14 St CH 1-1690  
Graybar Electric 1010 Rockwell CH 1-1360  
Kane 1666 E 40 St EX 1-4800  
Main Line Cleveland 5005 Euclid  
Northern Ohio Appl 1609 E 21 TO 1-0700  
\*Northern Ohio Labs 2073 W 85 W0 1-2756  
Olson Radio 2020 Euclid MA 1-6187  
\*Pioneer Electronic 2115 Prospect SU 1-9411  
Progress Radio 413 Huron Rd CH 1-5630

\*Radio & Electronics Parts 3235 Prospect Ave UT  
1-6060  
Strong & Carlisle-Hammond 2801 St Clair MA 1-9165  
Tecca Distr 4501 Prospect HE 2-1040  
Television Distr 3600 Ridge Rd ME 1-7100  
Westinghouse Elect 1809 E 22 TO 1-5660  
\*Winteradio 1468 W 25 St MA 1-9383

**COLUMBUS**  
\*Electronic Supply 134 E Long St  
General Electric Supply 146 N 3 St FL 4371  
Graybar Electric 3 & Chestnut St FL 3811  
\*Hughes-Peters 111 E Long MA 4356  
Kane 168 N 3 St Hdqrs Cleveland  
Ohio Appliances 241 N 4 St MA 7836  
Thompson Radio 182 E Long MA 7434  
Westinghouse Electric 266 N 4 St MA 5571  
\*Whitehead Radio 112 E Long St AD 1784

**DAYTON**  
\*Allied Supply 359 W Monument MI 9833  
General Electric 601 E 3 St MI 0781  
Graybar Electric 332 W Monument Ave MI 5665  
\*Hughes-Peters 300 W 5 St MI 8551  
Ohio Appliances 430 Leo St MI 0343  
\*Srepeo 314 Leo St MI 3874  
Stotts-Friedman 620 S Main St MI 8373  
Thompson & Hamilton 118 S Terry MI 9051  
Westinghouse Electric Supply 226 W 5 St MI 0331  
Yonts Radio & Appl 531 E 3 St HE 6777  
York Supply 531 E 3 St AD 5177

**EAST LIVERPOOL**  
D & R Radio Supply 631 Dresden Ave Hdqrs Stouben-  
ville

**ELYRIA**  
El-A-Co 235 Lodi St 2169

**LANCASTER**  
Bletzacker Electronics 135 W Chestnut St 2137  
Snyder Electric 319 Forest Rose 2986

**LIMA**  
Allied Supply 460 S Main St Hdqrs Dayton  
\*Hutch & Son 125 S Elizabeth St 98411  
\*Lima Radio Parts 600 N Main St 6-6551  
Northwestern Radio 131 S Elizabeth St  
\*Warren Radio Co 222 S Elizabeth St

**MANSFIELD**  
\*Burroughs Radio Hdqrs Canton  
Main TV Supply 488 Johns Ave  
Wholesaling Inc 775 Springmill 7287-6

**MARIETTA**  
Marietta Radio & Elect 221 2 St 1677

**MARION**  
Bell Radio 527 N Main St 2-5513  
Dillman Radio Supply 434 N Prospect St 2-8063  
Servex Distributing 131 N State St 20031

**MASSILLON**  
Martin M H 1118 Lincoln Way E 2-7467

**PORTSMOUTH**  
General Electric 1723 10 St  
Sound Elec Supply Co 7 & Finley St

**SANDUSKY**  
Bareo Electronic Parts 119 E Water 2471

**SPRINGFIELD**  
Eberle's Radio Supply 522 W Main St  
Standard Radio 119 W Main St  
Wholesale Supply 256 E Main St

**STEUBENVILLE**  
D & R Radio Supply 221 S 3 St 3-3643  
\*Hausfeld Radio Supply 116 N 3 St 2-4391

**TOLEDO**  
General Electric 28 N St Clair's AD 5104  
Graybar Electric 1700 Canton Ave MA 9166  
\*Howard's Electronic 135 17 AD 2277  
Lifetime Electronics 1501 Adams St MA 5643  
Main Line Distributors 380 S Erie St GA 4996  
Selectronic Supplier 1013 Jefferson St  
\*Toledo Radio Spec 1215 Jackson St AD 5828  
\*Warren Radio 1320 Madison AD 1191  
Westinghouse Electric 1225 Indiana AD 6184

**WARREN**  
D & J Electronic 236 Vine Ave SE 3721-6  
\*Radio Specialties 136 Pine St SE

**WASHINGTON COURT HOUSE**  
\*Hutch & Son 209 E Market

**YOUNGSTOWN**  
Appliance Wholesalers 1197 Wick Ave  
General Electric 265 W Rayen Ave 4-1111  
Graybar Elec 602 W Rayen Ave 4-0124  
Hamburg Bros 360 E Federal 3-2101  
Hood Electric Co 128 W Rayen Ave 4-0255  
Radio Parts 230 E Boardman St Hdqrs Pittsburgh Pa  
Ross Radio 325 W Federal St 6-6388

**ZANESVILLE**  
Thompson Radio 135 S 6 St 2-7311

**OKLAHOMA**

**LAWTON**  
Reynolds Radio 909 1/2 C Ave 1292

**McALISTER**  
S E Oklahoma Radio Supply 325 W Jackson 1240

**MUSKOGEE**  
\*Muskogee Electronic Supply 229 Court St 2834

**OKLAHOMA CITY**  
Dulaney's 825 N W 2 St 3-9461  
Electronic Supply 212 N W 10 CE 2-5215  
General Electric 127 E Calif St 3-5475  
Graybar Electric 12 E California 3-9351  
\*Miller-Jackson 121 E Calif St F0 5-8426  
\*Radio Supply 724 N Hudson St  
Southwest Radio & Equip 3N E 8 St RE 6-8535  
Westinghouse Electric 850 N W 2 St 2-7101  
Wolfe Distr 710 N W 2 St



**TULSA**  
 Electronic Supplies 219 E 1 St 4-6129  
 General Electric 14 N Guthrie St 3-6121  
 Graybar Electric 2406 E 12 St 6-1151  
 Industrial Electronic Supply 1124 E 4 St  
 Midwest Electronic 219 E 1 St 4-6129  
 Oil Capitol Electronics 923 E 4 5-7214  
 Patterson Radio 211 E 13 5-3179  
 \*Radio Inc 1000 S Main 4-9127  
 Southwest Radio & Equip 34 N Madison TU 2-5113  
 \*S & S Radio 721 S Detroit 54-5264  
 Westinghouse Electric 307 E Brady St  
 Wholesale Radio Supply 1410 E 11 St

**OREGON**

**EUGENE**  
 \*Carlson Hatton & Hay 96 E 10  
 Gilbert Bros 424 Charnelton St hdqrs Portland  
 Graybar Electric 2180 G Ave 4-2224  
 United Radio Supply 179 W 8 St hdqrs Portland

**KLAMATH FALLS**  
 R F Supply 2319 S 6 St

**MEDFORD**  
 \*Walker Co V G 205 W Jackson 2-4558

**PORTLAND**  
 Appliance Whole 600 N W 14 AT 6584  
 \*Central Distrs 1131 N W Couch  
 General Electric 300 N W 14 Ave BR 0651  
 Gilbert Bros 826 S W 2 Ave BR 5641  
 Graybar Electric Park & Flanders 6641  
 Harper-Megee 1506 N W Irving CA 4231  
 Johnson Co Low 422 N W 8 St CA 9551  
 Northwest Radio Supply 717 S W Ankeny AT 1021  
 Pacific Stationery 414 S W 2 CA 4221  
 \*Portland Radio 1300 W Burnside  
 Saelens Radio 1605 N W Everett BE 2423  
 \*Stubbs Electric 33 N W Park Ave BR 5404  
 \*Tracey & Co N W 10 & Glisan Sts  
 \*United Radio Supply 22 N W 9 Ave BE 6323  
 Westinghouse Elect 815 N W 12 Ave AT 6411

**SALEM**  
 Gilbert Bros 355 N High St hdqrs Portland  
 Johnson Co Low 1051 S Commercial hdqrs Portland

**PENNSYLVANIA**

**ALLENTOWN**  
 \*Federated Purchaser HE 3-7411 hdqrs New York NY  
 General Electric 1249 Liberty St HE 3-5206  
 Graybar Electric 1941 Hamilton 4-9341  
 Luckenbach & Johnson 1828 Tilghman St 4-6235  
 Peters A A 231 N 7 St HE 4-9361  
 Radio Electric Service 1042 Hamilton hdqrs Philadelphia  
 Steedle Norman D 1005 N 19 HE 5-5441  
 Westinghouse Elect 745 Union Blvd 4-5105

**ALTOONA**  
 Altoona TV Supply 1713 Union Ave 4-0827  
 General Electronics hdqrs Wheeling W Va  
 \*Hollenback's Radio 2221 8 6171  
 Kennedy's Radio Supply 1500 7 Ave

**BEAVER FALLS**  
 Reliable Motor Parts 1700 7 Ave 868

**BETHLEHEM**  
 \*Buss Radio Electric 59 E Broad St 7-3151

**BRADDOCK**  
 Marks Parts Co 1313 Braddock Ave EL 1-1314

**BUTLER**  
 Barron's Radio 333 E Jeff 7-5930

**CHESTER**  
 A C Radio Supply hdqrs Philadelphia

**EASTON**  
 \*Federated Purchaser, 925 Northampton 4259 hdqrs New York N Y  
 Radio Electric Service 918 Northampton

**ERIE**  
 B & D Whole Distr 502 E 10 St  
 \*Duncombe Co J V 1011 W 8 St 4-5278  
 General Electric 824 E 9 2-1477  
 \*Jordan Electronic Co 1130 German St 2-2462  
 \*Warren Radio 12 & State 4-5286  
 Westinghouse Elec 1820 State 4-8191

**GETTYSBURG**  
 Hartley & Co hdqrs Stanton Va

**GREENSBURG**  
 General Electronics hdqrs Wheeling W Va

**HARRISBURG**  
 D & H Distr 311 S Cameron St  
 Excelsior Radio 17 & Derry 8-8261  
 Graybar Electric 1039 S 13 8-7303  
 Harrisburg Radio 1124 Market St 6-2755  
 \*Radio Distr 915 S 13 4-0139

**HAZELTON**  
 Cerullo Electric 39 S Vine 1296  
 Moyer Electronic 758 N Locust

**JOHNSTOWN**  
 \*Baker Radio Electric 111 John St  
 \*Cambria Equip 17 Johns 6-1291  
 General Electric 80 Hickory 2-1225  
 Radio Parts Co hdqrs Pittsburgh  
 Westinghouse Electric 75 Hickory St 8-1293

**KINGSTON**  
 Barbey Co Geo D hdqrs Reading

**LANCASTER**  
 Eshelman Supply 110 N Water 8183  
 York Radio hdqrs York

**LEBANON**  
 Barbey Co Geo D hdqrs Reading

**McKEESPORT**  
 \*Barno Radio 321 6 Ave

**MONESSEN**  
 Mon Valley Electric 456 Schoonmaker Ave

**NANTICOKE**  
 Modern Electronic 102 S Market 583

**NEW BRIGHTON**  
 Television Parts Co 509 S Ave 5085

**NEW CASTLE**  
 Midwestern Elec 235 W Grant 4682

**NEW KENSINGTON**  
 Bearer Electric 1017 5 Ave ED 5-5801



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## VERMONT

**BURLINGTON**  
 General Electric 316 Pine St 3-3424  
 Hagar Hardware & Paint 164 St Paul St 4-4568  
 Vermont Hdw 4-6835  
 Westinghouse Electric 208 Flynn Ave 4-9985

**RUTLAND**  
 Oakman Electric Supply 12 Water St 594

## VIRGINIA

**ALEXANDRIA**  
 Certified Radio 1330 Powhatan St KI 8-5115  
 Suburban Distr 222 S Henry St KI 8-8073

**ARLINGTON**  
 Rucker Radio Wholesalers 1906 N Moore St hqrs  
 Washington DC

**BRISTOL**  
 Bristol Radio 31 Moore St 3544

**CHARLOTTESVILLE**  
 Virginia Radio 500 8 St N W 3-3928

**DANVILLE**  
 \*Womack Radio 502 Craghead 4622

**HAMPTON**  
 General Elec 1247 39 St Hwy HA 3-6526

**LYNCHBURG**  
 Eastern Electric Co 920 Commerce St 2-3497  
 Lynchburg Battery 406 5 St 2-1236

**NEWPORT NEWS**  
 General Supply 4215 Huntington 2-4007

**NORFOLK**  
 Electronic Eng'g Co 316 W Olney Rd 2-6403  
 General Electric 709 E 26 St 2-7183  
 Graybar Electric 333 W 21 St 2-2727  
 \*Radio Equip 821 W 21 St  
 \*Radio Parts Distr 128 W Olney 2-5711  
 \*Radio Supply 711 Granby St 2-1866  
 Westinghouse Elec 2600 Hampton 5-0525  
 Wyatt-Cornick 919 W 21 St hqrs Richmond

**PETERSBURG**  
 Electronic Supply 13 E Washington St PE 481  
 Virginia Battery 21 E Bank St 2812

**RICHMOND**  
 Cottrell Jr W C 408 E Main St 3-2402  
 General Elect 1505 Sherwood 6-4941  
 Graybar Electric 10 S 6 St 7-3491  
 Johnson Co D R 1315 E Cary St 7-3617  
 \*Johnston-Gasser Co 3023 W Marshall 6-9405  
 Mattson's Inc 519 W Broad St 3-6011  
 Meridan Electronic 608 W Broad 3-3450  
 \*Radio Supply 3302 W Broad St 6-3831  
 Westinghouse Electric 51 E Byrd 3-0111  
 \*Winfree Supply Co 800 W Cary St  
 Wyatt-Cornick Grace at 14 3-1945

**ROANOKE**  
 Baker Sales HC 19 Franklin Rd SW 9209  
 General Elec 515 Norfolk Ave SW 3-1564  
 Graybar Elec 601 Salem Ave 3-3615  
 \*Leonard Electronic 131 Center Ave N W 3-9339  
 \*Radio Supply 2009 Williamson Rd 6289  
 Wyatt-Cornick 605 3 St S E hqrs Richmond  
 Westinghouse Electric 732 1 St SE 7771

**STAUNTON**  
 Harley & Co 327 N Central 5-2333  
 Southern Electric 14 E Johnson 5-2313

## WASHINGTON

**BELLINGHAM**  
 Waitkus Supply 110 Grand Ave 274

**BREMERTON**  
 \*C & G Radio Supply 1301 Pacific Ave 3-3370

**EVERETT**  
 \*Pringle Radio Whole 2514 Colby Ave

**KENNEWICK**  
 Wible Radio Supply Inc hqrs Tacoma

**SEATTLE**  
 Alaska Radio Supply 1846 Westlake N AL 8777  
 Coast Radio 110 University St MA 9133  
 Garretson Radio Supply 2235 2 Ave  
 General Elect 1212 1 Ave S SE 6400  
 \*General Radio 100 Wall St  
 Graybar Elec King & Occidental MU 0123  
 \*Harper-Meggee 960 Republic SE 5100  
 Marshall-Wells 1258 1 SE 7447  
 \*Radio Products Sales 12 N 1 Ave  
 Radio TV & Appl 500 Westlake Ave N MA 0787  
 \*Seattle Radio Supply 2117 2 Ave SE 2345  
 \*Western Electronic 717 Dexter Ave AL 9000  
 Westinghouse Elec 1051 1 Ave S EL 7001  
 Westlake Electronic 511 Westlake N MA 6601  
 \*Zobrist Co H E 2121 Westlake

**SPOKANE**  
 Columbia Electric S 123 Wall St RI 3131  
 Frank's Radio Supply 161 S Adams St MA 8108  
 Graybar Electric 152 S Post St RI 3151  
 General Electric S 122 Monroe TE 1421  
 Harper-Meggee 734 N Division EM 4421  
 Johnson Co E M W 615 1 Ave RI 5432  
 Northwest Electr N 102 Monroe MA 9289  
 Spokane Radio Supply 305 W 2 Ave RI 8441  
 Standard Sales 1219 W 1 Ave RI 7196  
 Westinghouse Elec N 1023 Monroe EM 3371

**TACOMA**  
 \*C & G Radio Supply 2502 Jefferson Ave BR 3181  
 General Electric 2316 South A St BR 8454  
 Graybar Electric 2112 St MA 0164  
 Stewart Co A T 711 Broadway BR 3174  
 Westinghouse Elec 1930 Pacific BR 8417  
 \*Wible Radio Supply 909 Tacoma Ave BR 9935

**WALLA WALLA**  
 Kar Radio & Electric 12 & Pine Sts 4572

**YAKIMA**  
 Lay & Nord 112 S 2 St 8175

Westinghouse Elec 210 W B YA 3-4701  
 Yakima Wholesale Radio 206 S 8 Ave 4670

## WEST VIRGINIA

**BECKLEY**  
 \*Chemcity Radio & Elec hqrs Charleston

**BLUEFIELD**  
 Dixie Appliance 232 Bluefield Ave  
 \*Meyers Electronics 813 Bluefield Ave  
 Whitehead Radio Co 367 Bluefield Ave

**CHARLESTON**  
 Charleston Elect 914 Kanawha 6-0321  
 \*Chemcity Radio & Elect 103 Clendenin St 2-8151  
 Hicks Radio Supply 10 Virginia St 3-5583  
 Mountain Electronics 708 Bigley 3-5105  
 Virginian Electric Michigan Ave 60-631

**CLARKSBURG**  
 Mountain Electronics hqrs Charleston  
 Trenton Radio Co hqrs Morgantown  
 Westinghouse Electric 315 N 4 4-6311

**ELKINS**  
 W VA Radio & TV 444

**HUNTINGTON**  
 \*Electronic Supply 422 11 St 8779  
 \*King & Irwin 314 11 St 3-8414  
 \*TV Supply 1226 3 Ave 6639  
 Van Zandt Supply 1123 4 Ave 5193

**MARTINSBURG**  
 Plummers Radio 308 W King St 3821

**MORGANTOWN**  
 Trenton Radio 507 Beechurst Ave 5637

**PARKERSBURG**  
 Charleston Elect Supply 227 Ann St 7-4513  
 Cox Radio Supplies 554 7 St  
 Randle & Hornbrook 536 7 St 8-3391

**WHEELING**  
 General Electric 1422 Main St 2555  
 General Electronics 735 Main St 5738  
 Hamburg Bros 360 National Rd 727  
 Westinghouse Electric 1803 Eoff 3880  
 Wheeling Radio Supply 924 Market St

## WISCONSIN

**APPLETON**  
 Appleton Radio Supply 1217 N Richmond St 3-3345  
 General Electric 116 W Harris 3-5583  
 Valley Radio Distr 518 N Appleton St 3-6012

**CHIPPEWA FALLS**  
 Bushland Radio Specialties 6052

**EU CLAIRE**  
 Larson Electreaf J. H. hqrs Hudson

**FOND DU LAC**  
 Harris Radio 289 N Main St 8204

**GREEN BAY**  
 Electronic Expeditors 306 S Pearl St HE 2-4165  
 Nesio Electronic 308 N Chestnut AD 661  
 \*Northern Radio & TV 708 S Broadway HO 586  
 Westinghouse Electric 619 Main HO 8200

**HUDSON**  
 Larson Elec Co J H 109 Walnut St 248 W  
 Progress Supply 1321 3 St 828

**JANESVILLE**  
 Goodenough Radio 210 W Milwaukee 3747

**KENOSHA**  
 Badger Electronic Parts 4050 7 Ave 4-1484  
 Midwest Electronics hqrs Chicago III

**LA CROSSE**  
 Southern Minn Supply hqrs Mankato Minn  
 Stark Radio Supply 131 S 6 St 2-3186

**MADISON**  
 \*Radio Distr 701 E Johnson St 6-6801  
 \*Satterfield Radio 326 W Gorham 6-0267  
 Westinghouse Elect 1022 E Washington 5-4868

**MANITOWOC**  
 Harris Radio Corp hqrs Fond du Lac

**MARINETTE**  
 Popkey Co G M Main & 9 Sts

**MILWAUKEE**  
 Ackermann Radio 3176 N 27 St HI 2-7173  
 \*Acme Radio 510 W State St BR 1-0641  
 \*Central Radio 1723 W Fond du Lac Ave WE 3-2982  
 Electronic Expeditors 2205 W Villet WE 3-8283  
 Electro-Pilance Distr 2458 W Lisbon Ave DI 2-9240  
 General Electric 190 N Broadway DA 8-5400  
 Graybar Elec 180 N Jefferson MA 8-1946  
 \*Marsh Radio Supply 838 N 4 St DA 8-1320  
 Mid-City Electronic 2327 W Wells WE 3-8304  
 \*Radio Parts Co 538 W State MA 8-4048  
 Radio Specialty 829 N Bway MA 8-2060  
 Roth Appl 647 W Virginia BR 1-1111  
 Seemuth Distr 2406 W Lisbon St DI 2-9240  
 Sievert Distr 1415 W Mitchell St OR 2-9000  
 Taylor Elec 112 N Broadway BR 1-5400  
 Television Parts 714 W State BR 2-6276  
 Westinghouse Elec 546 N Bway DA 8-1800

**RACINE**  
 Allen's Merchandising 1206 N Wisconsin St 3-8589  
 Badger Electronic 856 Washington 3-4024  
 \*Standard Radio Parts 1244 State St 4-3634  
 Superior Radio Parts 908 State St 4-7890

**SHEBOYGAN**  
 Koepsell Co J J S 9 at Commerce 3646  
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# ELECTRONIC INDUSTRIES DIRECTORY of COMMERCIAL COMPANIES OFFERING Consulting Services

This alphabetical listing of commercial companies offering engineering consulting services covers all aspects of the radio-TV-electronic and allied fields. The particular specialty of each is indicated by the code letter following the firm name and address. For a listing of individual Consulting Engineers, see page 202.

**Broadcast . . . . . A**  
**Communications . . . . . B**  
**Component Manufacturing . . . . . C**  
**Electronic Control Systems . . . . . D**  
**Equipment Manufacturing . . . . . E**  
**Industrial Electronics . . . . . F**  
**Medical Electronics . . . . . G**  
**Recording, Audio . . . . . H**

Acme Electronics Inc 300 N Lake Ave Pasadena 4 Calif C,E  
Aero Electronics Co 1512 N Wells St Chicago 10 Ill D,E,F  
Allen E A 1913 N Vermont Ave Los Angeles 27 Calif C,E  
Allied Int'l Inc 230 Park Ave New York 17 N Y B,C,D,F  
Allied Research & Engg 1041 N Los Palmas Ave Hollywood 38 Calif C  
Applied Science Corp of Princeton P O Box 44 Princeton N J C,E  
Associated Research Inc 3758 W Belmont Ave Chicago 18 Ill E  
Atlantic Electronics Corp 4 Manhasset Ave Port Washington N Y D,E,F  
Audio Master Corp 341 Madison Ave New York 17 N Y F,H  
Audiotechnics 1841 Broadway New York 23 N Y B,H  
Austin Co 76 9 Ave New York 11 N Y D,E,F,H  
Aviation Electronic Service Box 322 Wheeling Ill B,E,F  
Baldwin Eng'g Service 11168 Santa Monica Blvd Los Angeles 25, Calif D

Barnes & Reinecke Inc 230 E Ohio St Chicago 11 Ill D  
Barry Corp 761 Pleasant St Watertown 72 Mass C  
Battelle Memorial Inst 505 King Ave Columbus 1 Ohio D,F,G  
Bauman & Bluzat 2753 W North Ave Chicago 47 Ill B,C,D,E,F  
Becker & Associates H W 1103 N Pulaski Rd Chicago 51 Ill B,D,E,G  
Benson-Lehner Corp 2340 Sawtelle Blvd Los Angeles 64 Calif D,E,F  
Boesch Mfg Co Danbury Conn E  
Bogan & Associates C W 1204 Wisconsin Ave N W Washington 7 D C A,B  
Bond Conner & Oakley 516 Galway Pl El Cajon Calif  
Bristol Eng'g Corp Lincoln & Pond Sts Bristol Pa E  
Broadcast Eng'g Service P O Box 1387 Shreveport 92 La A  
Brownthorn Electronics Inc 162 E 38 St New York 16 N Y D,F  
Buck Eng'g Co 37 Marcy St Freehold N J E,F  
Budelman Radio Corp 375 Fairfield Ave Stamford Conn B  
C G S Labs Inc 391 Ludlow St Stamford Conn B,C,D,E,F  
Clarke & Hartman 408 Summit Ave Jersey City N J  
Communications & Electronics 219 W Shawnee Dr Montgomery 7 Ala B,D,F  
Continental Electronics Ltd 302 Oakland St Brooklyn 22 N Y B,D,H  
Corona Eng'g Service 94-52 Corona Ave Elmhurst L I N Y C,E,F  
Dade Brothers Inc Old Country Rd Mineola L I N Y E  
Dage Electronics Corp 69 N 2 St Beech Grovc Ind A,B,F  
Davies Labs Inc 4705 Queensbury Rd Riverdale Md E  
Deigert & Yerkes 3205 N St N W Washington D C A,B  
Designers for Industry Inc 2915 Detroit Ave Cleveland 13 Ohio D,E  
Devenco Inc 150 Broadway New York 38 N Y A,B,D,F,G,H  
Diatron Co 3327 Dixie Dr Houston 21 Texas D,E,F  
Douglas Eng'g Co Montville N J C  
Edgerton Germeshausen & Grier Inc 160 Brookline Ave Boston 15 Mass D,F  
Egan Lab 107-56 113 St Richmond Hill 19 N Y F,G  
Eitel-McCullough San Bruno Calif. A,B,D,F  
Eldico of N Y 44-31 Douglasson Pkwy Jauglston L I N Y B,E,F  
Eldi Electronic Devices 204 W Houston St New York 14 N Y B,C  
Electrical Communication Co 765 Clementina St San Francisco 3 Calif B  
Electronic Eng Co 362 W Bowery St Akron 7 Ohio A,B,F,H  
Electronic Products Co Box 450 Red Bank N J F  
Electronic Sound Equipment Co 2319 W 11 St Los Angeles 6 Calif B,D,E,F,H  
El-Tronics Inc 5 & Noble Sts Philadelphia 23 Pa B,D,E,F,G  
Eng'g Research Associates Div Romington Rand Inc 1902 W Minnehaha Ave St Paul 4 Minn B,C,D,E,F  
Eng'g Research & Devel. Co Addison Ill D,F  
Equipment & Service Co 6815 Oriole Dr Dallas 9 Texas A,B,D,E,F,H  
Erwood Inc 1770 W Berteau Ave Chicago 13 Ill D,F  
Executone Inc 415 Lexington Ave New York 17 N Y B,D,F,G  
Farmers Eng'g & Mfg Co Irwin Pa B,D  
Feiler Eng'g & Mfg Co 8026 N Monticello Ave Skokie Ill B,E  
General Electrosonics Inc 32 W 22 St New York 10 N Y B,E  
General Electric Co Syracuse N. Y. A,B,D,F  
Gibbs & Cox Inc 21 West St New York 6 N Y B,D,F  
Gibson & Associates S K 108 Greenwood Lane Waltham 54 Mass C,E,F,G,H  
Greibach Research & Devel Labs 80 Pryor Terr New Rochelle N Y B,D,E,F,G,H  
Grem Eng'g Co. 492 3 St Brooklyn N Y D,E,F  
G W Associates P O Box 2263 El Segundo Calif C,E,F  
Hahn & Co 1515 Halsted St Chicago Hts Ill B  
Hallett Mfg Co 1601 W Florence Ave Inglewood Calif B,C,E,F  
Hanson-Gorrill-Brian Inc 1 Continental Hill Glen Cove N Y D,E,F  
Harden Electric Co P O Box 208 Columbus Ind D,F  
Hare Co D G C 30 Burtis Ave New Canaan Conn D,E,F,H  
Hopkins Eng'g Co 1612 K St N W Washington 6 D C B,E,F  
Industrial Electronic Eng'g 3973 Lankersheim Blvd N Hollywood Calif D,F  
Industrial Research Products Inc 9400 Belmont Ave Franklin Park Ill D,H  
Int'l Research Associates 2221 Warwick Ave Santa Monica Calif A,B,E  
Isberg Eng'g Labs 2001 Barbara Dr Palo Alto Calif A,E  
Jacobs Instrument Co 4718 Bethesda Ave Bethesda 14 Md B,C,D,F  
Jarvis Electronics Corp 6058 Fullerton Ave Chicago 39 Ill B,C,D,E,F

Kaiser Aluminum & Chemical Corp P O Box 1451 Spokane 10 Wash B,D,F  
Kear & Kennedy 1302 18 N W Wash. 6 D C A,B  
A,B  
Kepco Labs 131-38 Sanford Ave Flushing 55 N Y D,E,F  
Knight & Associates L B 600 W Jackson Blvd Chicago 6 Ill C,E  
Korb Eng'g & Mfg Co 30 Ottawa Ave Grandville Mich B,D,E,F,H  
Lavin Associates Henry P O Box 196 Meriden Conn C,D,F  
LePace Mfg Co 75-19 64 St Glendale 27 N Y C,F  
Lerner Instrument & Electronics Mfg Corp GPO Box 620 Brooklyn 1 N Y C  
Mag-Electric Products Inc 14405 S Crenshaw Blvd Gardena Calif C,D,E,F  
Magnaflux Corp 7300 W Lawrence Ave Chicago 31 Ill E  
Magnetic Amplifiers Inc 632 Tinton Ave New York 55 N Y C,D,E,F  
Magnuson Engineers 509 Emory St San Jose 11 Calif E,F  
Management-Training Assoc 3308 14 St N W Washington 10 D C B,D,H  
Mark Products Co 3547 Montrose Ave Chicago 18 Ill B  
Marvis Electronics 530 S Ridgeland Ave Oak Park Ill D,F  
May Eng'g Co 6055 Lankersheim Blvd N Hollywood Calif C,E,F  
Medcraft Electronic Corp 41-41 24 St Long Island City 1 N Y G  
Melpar Inc 452 Swann Ave Alexandria Va B,D,E  
Morefield Co John A Camp Hill Pa B,D,E,F  
Multi-Craft Inc 2511 11 St Columbus Nebr A,B,D,E,F,H  
Multi-Tron Lab 4624 Washington Blvd Chicago 44 Ill C,D,F  
National Electronics Labs 1713 Kalamazoo Rd N W Washington 9 D C B,E  
National Instrument Co 23 E 26 St New York 10 N Y B,C,D  
Nestor Eng'g Co 24 Chestnut St Rutherford N J B,E,F  
Nuclear Instrument & Chemical Corp 233 W Erie St Chicago 10 Ill D,E,F,G  
Palo Alto Physicists P O Box 1069 Palo Alto Calif B,G,H  
Pariser & Co M I 1475 Broadway New York 18 N Y A,B,C,E,F  
Patterson Moos & Co 90-28 Van Wyck Expressway Jamaica 18 N Y B,C,D,E  
PCA Electronics Inc 2180 Cofo Ave Santa Monica Cal C,E  
Petcar Research Corp 503 Washington Ave Belleville 9 N J D  
Phocnix Precision Instrument Co 3803 N 5 St Philadelphia 40 Pa B,D,F,G  
Pickard & Burns Inc 240 Highland Ave Needham Mass B,D  
Prodelin Inc 307 Bergen Ave Kearny N J A,B  
Pulse Techniques Inc 1411 Palisade Ave W Englewood N J B,D,E,F,H  
Radiation Inc P O Box Q Melbourne Fla  
Radioactive Products Inc 443 W Congress Detroit 26 Mich D,E,F,G  
Radio Corp of America Camden N J A,B,D  
Radio Eng'g 8 State St New York 4 N Y D,E,F,G  
Rea Co J B 11941 Wilshire Blvd Los Angeles 25 Calif D,F  
Reevesound Co 35-54 36 St L I City 1 N Y B,C,D,E,F,H  
Research Electronics Labs Roslyn Pa D,E,F  
Rich Electronics Inc 212 N W 8 Ave Miami 36 Fla B,D,E,F  
Richardson Co 2790 Lake St Metrose Park Ill C  
Robinette Co W C 802 Fair Oaks Ave S Pasadena Calif D,E,F  
Rockwell Eng'g Co 4063 N New Jersey St Indianapolis 5 Ind D  
Rolab Studios Sandy Hook Conn E. G. H  
Rosenberg Associates Paul 100 Stevens Ave Mt Vernon N Y D,F,G  
Rust Industrial Co 608 Willow St Manchester N H A,B,C,D,E,F  
Rutherford Electronics Co 3707 S Robertson Blvd Culver City Calif E,F  
Shepard Labs 480 Morris Ave Summit N J D,F  
Shoup Eng'g Co 221 E Cullerton St Chicago 16 Ill D,E,F,H  
Smith Hinchman Grylls Inc Drawer 551 Ypsilanti Mich D,F  
Smith-Meeker Eng'g Co 157 Chambers St New York 7 N Y B,D,E,H  
Spar Eng'g & Devel Inc South & Paxson Aves Wyncoote Pa D,E,F,G  
Spera Electronics Labs 37-10 33 St Long Island City N Y A,B,E,F,H  
Standard Electronics 285 Emmet St Newark 5 N J A,C  
Stratoseal Mfg Co 3039 W Fullerton Ave Chicago 47 Ill C  
Technical Consultants Inc (Tecon) 550 Fifth Ave New York 19 N Y A,C,E  
Telechrome Inc 88 Merrick Rd Amityville L I N Y A,B  
Telectro Industries Corp 35-16 37 St Long Island City 1 N Y C,D,F,H  
Thompson Clock Co H C 38 Federal St Bristol Conn  
Triisch Co John D 1310 McKinnay Ave Houston Texas A,B,E  
U S Testing Co 1550 Park Ave Hoboken N J B,C,D,E,F  
Universal Electronics Co 2012 S Sepulveda Blvd Los Angeles 25 Calif D,E,F  
Universal Scientific Co 1102 Shelby St Vincennes Ind E,F,G  
Videon Electronic Corp 222 E Ohio St Indianapolis 4 Ind B,D,E,F,G  
Wachter Engineers C L 60 Ridgewood Rd Rockville Center L I N Y F,H  
Walker Electric Co. B 132 Nassau St New York 7 N Y A,B,D,F,G,H  
Western Instrument Co 826 N Victory Blvd Burbank Calif B,D,F  
Western Radiation Lab 1107 W 24 St Los Angeles 7 Calif E,F,G  
Willys-Overland Motors Inc 6225 Benore Rd Toledo Ohio A,B,D,E,F  
Wright Eng'g Co 28 S Virginia Ave Danville Ill D,F  
Wyeth Engineering 6021 Depster St Morton Grove Ill A,B,C,D,E,F,G,H

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# Alphabetical Listing of Manufacturers

## WITH THE NEW, EXCLUSIVE LOCALIZER INDEX

A complete listing of the names and addresses of all the manufacturers in the electronic and allied industries together with organizations providing special industrial and/or broadcast services. In the LOCALIZER INDEX listings many manufacturers have listed home office telephone numbers, executive

personnel, brand names, products, branch and regional offices as well as local reps. The LOCALIZER INDEX provides you with the shortest means of contacting any manufacturer. Symbols show type of sales: BO branch off; D distrib; DS distrib sls; GV govmt sls; IDS industl & distrib sls; R rep; SE sls engr

Indented listings are advertisements.

Abalon Precision 540 Gasanova Bronx 59 NY  
 ABC Radio Labs 3334 W NJ St Indianapolis Ind  
 ABT Mfg 715 N Kedzie Chicago 12 III  
 Academy Film 123 W Chestnut Chicago III  
 Accurate Eng'g 2005 Blue Island Chicago 8 III  
 Accurate Insulated Wire 25 Fox New Haven 13 Conn  
 Accurate Mfg 44 Hopworth Pl Garfield NJ  
 Accurate Paper Tube 805 N Peoria Chicago 22 III  
 Accurate Spring Mfg 3811 W Lake St Chicago III  
 Ace Coil & Electronics 914 Middlesex Metuchen NJ  
 Ace Elec Mfg 1458 Shakespeare New York 52 NY  
 Ace Engr & Machine 3644 N Lawrence Phila 40 Pa  
 Ace Mfg Corp Chalfont Pa  
 Ace Spring Mfg 78 W Houston New York 12 NY  
 Acheson Colloids 1950 Washington Pt Huron Mich  
 Ackerman Engravers 75 Warren New York 7 NY  
 Ackerman-Johnson 625 W Jackson Blvd Chicago 6 III  
 Acme Battery 59 Pearl Brooklyn NY  
 Acme Coil & Transform 1915 N Claybourne Chicago 14 III  
 Acme Electric Corp Cuba NY  
 Acme Electric Heating 1217 Washington Boston Mass  
 Acme Electronics 300 N Lake Pasadena 4 Calif  
 Acme Folding Box 149 E 25 New York NY  
 Acme Industrial 200 N Laffin Chicago 7 III  
 Acme Oxygen 119 S 4 St Harrison NJ  
 Acme Scientific 1450 W Randolph Chicago 7 III  
 Acme Wire Co New Haven Conn  
 Acorn Electronics Gibson City III  
 Acromark Co 9 Morrell Elizabeth 4 NJ  
 Acro Mfg 2040E Main Columbus 16 Ohio  
 Acro Products 369 Shurs Lane Phila 28 Pa  
 Acro Switch Columbus Ohio  
 Acro Tool & Die 4554 Brdwy Chicago 40 III  
 Acro Transformer & Mfg 26-02 4 St L I City 2 NY  
 Actioncraft Prods 8 Sagamore Hill Pt Washington NY  
 AC Transformer 21 Prospect St Newark NJ  
 Adair G P 1601 I St NW Washington DC  
 Adams Lighting 48 W 27 New York 1 NY  
 Adams & Westlake 1025 N Michigan Elkhart Ind  
 Adel Div GMC Corp 10777 Van Owen Burbank Calif  
 Adelphi Co 5619½ Sunset Hollywood 28 Calif  
 Adler Communications 1 LeFevre New Rochelle NY  
 Admiral Corp 3800 Courtlandt Chicago 47 III  
 Advance Electric & Relay 2435 N Naomi Burbank Calif

Atlanta-IDS—James Millar Assoc 1036 Peachtree St N E Hemlock 1648  
 Camden-IDS—Bittan-Boenecke Co 210 No Sixth St Woodlawn 4-8650  
 Chicago-IDS—Royal J Higgins Co 10105 S Western Ave Cedar Crest 3-7388  
 Cleveland-IDS—Edward-Lohse & Co 2123 E 9th St Tower 1-5753  
 Dallas-IDS—Carl L Bumpas 2212 Centerville Road Riverside 4042  
 Denver-IDS—Ronald G Bowen Co 446 Broadway Sherman 2501  
 Kansas City-IDS—Clyde H Schryver Sales Co 4550 Main St Westport 4660  
 Los Angeles-IDS—Paul F Wiley 1406 S Grand Ave Richmond 6191  
 Los Angeles-DS—George Davis 5259 E Beverly Blvd Underhill 0-3594  
 New York-IDS—D R Bittan Co 53 Park Pl Barclay 7-2789  
 San Francisco-IDS—Harold L Newnan 420 Market St YUkon 6-3897  
 Seattle-IDS—Samuel N Stroum Co 1612 Broadway FRanklin 7515-6  
 Syracuse-IDS—Wally B Swank 2310 Bellevue Ave SYracuse 76-8056  
 Toronto-IDS—Atlas Radio Corp Ltd 560 King St West

Advance Electronic 8510 N End Oak Park 37 Mich  
 Advance Electronics PO Box 394 Passaic NJ  
 Advance Insul Wire & Cable 4 Tingley La Plainfield NJ  
 Mail Address: PO Box 1026 Plainfield NJ  
 President—John L Wilson  
 V P—Edgar Bauerer  
 Sec—Joseph Schenkman

Treas—Jack Schenkman  
 Albuquerque NM-R—John Gorder Jr Co 1624 W 1st St Albuquerque 2-3581 covers Colo-NM-Ariz-Utah-Wyo-W Tex  
 Atlanta-R—Southern Agencies PO Box 4745 Alpine 6822 covers: Ala-Ga-Fla-NC-SC  
 Boston-R—J J Costello Co 131 Clarendon St Commonwealth 6-3826 covers: Me-Mass-Conn-NH-RI-Vt  
 Kansas City-R—Curt Conrad Co 4001 Bdway Jefferson 3510 covers: Ia-Kans-Mo-Neb  
 Los Angeles-R—Harry A Lasure Co 9041 W Pico Blvd BRadshaw 2-7307 covers: Ariz-Cal-Nev-NM  
 New Orleans-R—Chester Lloyd 1117 Annunciation St Raymond 3498 covers: Ark-La-Miss-Okla-Tex  
 Niles Ohio-R—Southern Agencies 404 Orchard Ave Niles 23640 covers: Ind-Ky-O-Tenn  
 Philadelphia-R—Samuel K Macdonald Inc 1531 Spruce St Kingsley 5-1205 covers S NJ-Pa-Md-W Va  
 Portland-R—Pacific Electric Sales Co 140 SE 28th Ave Vermont 1585 covers: Wash-Ore-Mont-Ida  
 San Francisco-R—Electric Agencies Inc 940 Russ Bldg YUkon 6-2841 covers N Cal  
 Tuckahoe-R—Jack Brown Assoc 25 Beaumont Circle Spencer 9-7330 covers: N Y State incl NY City  
 Washington DC-R—Arthur Murray 1004 6 St NW District 7-8280 covers DC-Md-Va

Advance Recording Prods 36-12 34 St L I City 1 NY  
 Advance Transformer 1122 W Catalpa Chicago 40 III  
 Advanced Vacuum Prods 22 Liberty Stamford Conn  
 Aerocoil Inc 24 Cliff Jersey City NJ  
 Aero-Coupling Corp Burbank Calif  
 Aero Electronics 1512 N Wells Chicago 10 III  
 Aerolite Electronics 507 26 St Union City NJ  
 Aerolux Light Corp 653 11 Ave New York 36 NY  
 Aeromotive Equip 1632 Central Kansas City 10 Mo  
 Aeronautical Comm Equip 3090 Douglas Miami 33 Fla  
 Aeronautical Electric 5103 W Lawrence Chicago 30 III  
 Aeronautical Electronics PO Box 6043 Raleigh NC  
 Aeronautical Radio Mfg 155 1 St Mineola NY  
 Aeroquip Corp 300 S East Jackson Mich  
 Aero-Tone Mfg 4836 Joy Detroit 4 Mich  
 Aerovox Corp 740 Belleville New Bedford Mass  
 Actna Felt 204 Centre St New York 13 NY  
 Affiliated Photo Co 21 W 45 New York 19 NY  
 Ahrendt Instrument Co 4910 Calvert College Park Md  
 Ainslie Electronic Prods 312 Quincey Quincy Mass  
 Air Associates Inc 511 Joyce St Orange NJ  
 Air Associates Inc Glendale 1 Calif  
 Airborne Accessories 1414 Chestnut Hillside 5 NJ  
 Airborne Electronics Co Van Nuys Calif  
 Airborne Instruments Lab 160 Old County Mineola LI NY  
 Aircraft Armaments 4415 Reistertown Baltimore 15 Md  
 Aircraft Electronics 94 Silas Deane Hwy Rocky Hill Conn  
 Aircraft Marine Prods 2100 Paxton Harrisburg Pa  
 Aircraft Radio Corp Boonton NJ  
 Aircraft Transformer Corp Long Branch NJ  
 Airdesign Inc 241 Fairfield Upper Darby Pa  
 Airdraulics Engg 30 Burtis New Canaan Conn  
 Airlyte Electronics 21 Cottage Bayonne 8 NJ  
 Air-Marine Motors 3939 Merrick Rd Seaford NY

Babylon NY-R—Timony Co Covers NY-N NJ  
 Boston-R—Dan Greene 2311 John Hancock Bldg PO Box 112 Hancock 6-1432 Covers New England  
 Chicago-R—Harry W Gebhard 5129 W Devon Ave Rodney 3-3636 covers III-S Wisc-Iowa  
 Cleveland-R—Jay Engineering Co 5413 Pearl Rd Tuxedo 4-4080 covers Ohio-Ind  
 Dallas-R—Campion Sls Co Jefferson Tower Bm 704 YUkon 9902 covers Tex-Okla  
 Dayton-R—Jay Engineering Co 1721 E 3rd St Kenmore 2151 covers Ohio-Ind  
 Detroit-R—S Sterling Co 15310 W McNichols Rd Broadway 3-2900 covers Mich  
 Los Angeles-R—E V Roberts Asso 5068 W Washington Blvd Webster 3-5731 covers Ariz-N Mex-Cal

Philadelphia-R—L Parker Naudoin Broad St Station Bldg Rittenhouse 6-3185 Covers S NJ-E Pa-Md  
 Phoenix-R—E V Roberts Asso 909 N 1st St PHoenix 2-8824 Covers Ariz  
 San Francisco-R—E V Roberts Asso 988 Market St Graystone 4-6655 Covers N Cal  
 St. Louis-R—Harris-Hanson Co 5506 S Kingshighway SWeebriar 5584 Covers Mo  
 Syracuse-R—Oliver Wolf 15 Centennial Dr Syracuse 4-7723 Covers N NY  
 Toronto-R—John S Root 290 Lawrence Ave W Covers Canada

Air Marshall 12 E 44 New York NY  
 Airpax Products PO Box 137 Baltimore 20 Md  
 Airplane & Marine Instruments Clearfield Pa  
 Air-Tone Sound 1527 Chestnut Philadelphia 2 Pa  
 Airtron Inc 1109 W Elizabeth Linden NJ

Albuquerque-R—H A Kittelson Co 210 Caqua Drive NE Mgr Neil Powell  
 Chicago-R—Hower & Pretat 4 N Cicero Ave Dallas-R—Jack F. McKinney Sales Co 1330 N Industrial Blvd  
 Dayton-R—Andy Grimm 1731 Ruskin Rd  
 Kansas City-R—W R Fry & Co Broadway at 34th St Suite 510 Portor Bldg  
 Los Angeles-R—Harold A Kittleson 7614 Melrose Ave  
 Seattle-R—Ron Merritt 217 9 Ave

Airtronix Devel Corp 20 W 22 New York 10 NY  
 Air-Up Tower 350 E Bdwy Muskegon Heights Mich  
 Ajax Condenser 932 W Wrightwood Chicago 14 III  
 AJF Industries 852 Monroe Brooklyn 21 NY  
 Akeley Camera & Instrument 345 Hudson New York NY  
 Akron Rubber Co 53 Warren St New York 7 NY  
 Aladdin Radio Industries 501 W 35 Chicago 16 III  
 Alamo Electronics 105 W Romana San Antonio Tex  
 Alcar Instruments 2 Godwin Ave Fairlawn NJ  
 Alco Electronics Mfg 102 Marston Lawrence Mass  
 Alco Mfg 4011 Cuming St Omaha 3 Nebr  
 Alcon Metal Prods 1750 N Kimball Chicago 47 III  
 Aiden Electronics PO Box 125 Westboro Mass  
 Aiden Products 117 N Main Brockton 64 Mass  
 Alexander Film Co Colorado Springs Colo  
 Alina Corp 401 Broadway New York 13 NY  
 All Channel Antenna 70-07 Queens Blvd Woodside 77 NY

President—Marvin P Middlemark  
 V P—William T Korn  
 All Direction Antennas and 4 Conductor Tubular Wire

Allegheny Ludlum Steel Oliver Bldg Pittsburgh 22 Pa  
 Allen-Bradley 110 W Greenfield Ave Milwaukee 4 Wisc  
 Allen Co L B 6751 Bryn Mawr Ave Chicago 31 III  
 Allen Mfg 133 Sheldon St Hartford Conn  
 Alliance Mfg 100 Lake Pk Blvd Alliance Ohio

Phone: 15361  
 Vice Pres—John Bentia  
 Atlanta-R—Maitland K Smith 317 Forrest Ave NE Walnut 6094  
 Buffalo-R—Fillmore & Fillmore 647 Elmwood Ave Summer 3355  
 Camden NJ-R—Andrew A Foley 640 Federal St Woodlawn 3-2693  
 Chicago-R—Jerry Gollen Co 2750 W North Ave Everglade 4-5959  
 Chicago-R—George Pettit 549 W Washington Blvd Randolph 6-0582  
 Cleveland-R—C J Perrier Box 1044 Stu A 5715 Walworth Ave Cherry 1-7766  
 Columbus-R—C L Pugh Co 4500 Dublin Rd Kingswood 4855  
 Dallas-R—Hal F Corry Co 3111 Knox St Justin 9172  
 Denver-R—W H Connors Co 5532 E Colfax Fremont 0566  
 Detroit-R—H E Walton Co 76 Kercheval Grosse Pointe Tuxedo 1-5858  
 Fort Wayne-R—M W Fisch 419 Sherwood Terrace W Harrison 1089  
 Kansas City Mo-R—R W Farris Co 406 W 34th St Logan 7495

(continued on next page)









## ALPHABETICAL LISTING of MANUFACTURERS with LOCALIZER INDEX

Chatillon & Sons John 93 Cliff St New York 38 NY  
Cherry Channer 1488 Skokie Blvd Highland Park Ill  
Cherry Rivet 1224 E Delhi Santa Ana Calif  
Chester C-ble 100 Hill Chester NY  
Chester Electronics 3922 W Central Toledo Ohio  
Chester-Morton Electronics Corp Chester Pa.  
Chicago Condenser 3255 W Armitage Chicago 47 Ill  
Chicago Dial 2917 S LaSalle St Chicago 16 Ill  
Chicago Die Mold 4001 Wrightwood Ave Chicago 39 Ill  
Chicago Electronic Eng'g 3223 Armitage Chicago 47 Ill  
Chicago Industrial 536 W Elm Chicago 10 Ill  
Chicago Telephone Supply 1142 W Beardsley Elkart Ind  
Chicago Tool & Eng'r 8383 S Chicago Chicago 17 Ill  
Chicago Transformer 3501 Addison Chicago 18 Ill  
Churchill Lighting 344 Franklin Melrose 76 Mass  
Ciba Co 627 Greenwlich New York 14 NY  
Cima Corp 119 Braintree Allston Mass  
Cinch Mfg 1026 S Homan Chicago 24 Ill

President—Lester W Tarr  
VP & Gen Mgr—E J Pool  
Sls Mgr—S Pfannstiehl  
VP & Dev Engr—S M DelComp  
Credit Mgr—E L Hvale  
Purch Agt—T A Hopkins  
Adv Mgr—D T Campbell  
Export Mgr—Carrington H Stone  
Traffic Mgr—T A Hopkins  
Plastics Engr—G F Mongin  
Atlanta—J M Cartwright & Son 4030 Club Dr NE  
Cherokee 2483  
Buffalo 21—R D Holt 463 Huxley Dr Parkside 0984  
Charlotte—J M Cartwright PO Box 9203 Plaza Station  
Phone 6-8648  
Chicago—C R Clough Jr Covers Ind-Ohio-Ky P G  
Tomy Covers Iowa-Minn B F Becker Covers Wisc  
Nevada 2-2000  
Detroit 11—H Eggericks 2832 E. Grand Blvd  
Trinity 3-9500  
Los Angeles 14—A C Maynard 1709 W 8th St  
DUmkirk 7-5371j  
Memphis—J M Cartwright & Son 1336 Modison Ave  
Phone 2-1914  
Newtonville Mass—E P Cogswell 459 Watertown St  
LaSalle 7-8490  
New York 10—G S Maynard Jr R W Boynton 15 E  
26th St Murray Hill 3-9356  
Philadelphia 40—W C MacFadden 3701 N Broad St  
Radcliffe 5-4775  
Springfield Mo—W H Hehs 1303 E Sanford St  
Hamilton Ont—R M Healy Goge Ave & Beoch Rd  
Phone 4-5791  
Montreal Que—J R Johnston 502 University Tower  
Bldg Marquette 8609  
Toronto 5 Ont—B H Morosh—W C Miller 265A  
Davenport Rd Princess 2157

Cinch-Jones Sls Div Cinch Mfg 1026 S Homan Chicago Ill  
President—Lester W Tarr  
VP & Gen Mgr—E J Pool  
Sls Mgr—S Pfannstiehl  
VP & Dev Engr—S M DelComp  
Credit Mgr—E L Hvale  
Purch Agt—T A Hopkins  
Adv Mgr—D T Campbell  
Export Mgr—Carrington H Stone  
Traffic Mgr—T A Hopkins  
Plastics Engr—G F Mongin  
Atlanta—J M Cartwright & Son 1145 Peachtree St  
NE Hemlock 6161  
Boston—Ray Perron & Co 131 Clarendon St Ken-  
more 1370  
Buffalo—Cinch-Jones Sls Div 463 Huxley Dr Park-  
side 0984  
Charlotte—J M Cartwright & Son PO Box 9203  
Plaza Station  
Chicago—B F Becker Covers Wisc—P G Tomy Covers  
Iowa-Minn Nevada 2-2000  
Cleveland—Scott & Steffen 1836 Euclid Ave  
MAIn 1-1286  
Detroit—Cinch-Jones Sls Div 2832 E Grand Blvd  
Trinity 3-9500  
Memphis—J M Cartwright & Son 1336 Madison Ave  
Phone 2-1914  
New York—Cinch Jones Sls Div 15 E 26th St  
Murray Hill 3-9356  
Philadelphia—S K Macdonald 1531 Spruce St  
Kingsley 1205  
Pittsburgh—S K Macdonald 335 Fifth Ave Atlantic  
2253  
Springfield Mo—1303 E Stanford St Phone 65603  
Washington DC—S K Macdonald 3308 Fourteenth St  
NW Columbia 3938  
Hamilton Ont—Cinch-Jones Sls Div Gage Ave &  
Beach Rd

Cincinnati Molding 2037 Florence Cincinnati 6 Ohio  
Cincinnati Ventilating Covington Ky  
Cinecraft Productions 2515 Franklin Cleveland 13 Ohio  
Cineffects Inc 115 W 45 New York 19 NY  
Cinegraphics Inc 5 E 57 New York 22 NY  
Cinema Eng'g Div Aerovox Corp Burbank Calif  
Cinemart Inc 322 E 44 New York 17 NY  
Cinematic Devel & Cinechrome 2125 32 San Francisco Cal  
Cinotech Co 106 West End New York 23 NY  
Circle Mfg Co PO Box 152 Little Falls NJ  
Circuitron Inc 400 9 St Hoboken NJ  
Citation Prods 233 E 146 St New York 51 NY  
Clare & Co C P 4719 W Sunnyside Chicago 30 Ill  
Claremont Labs Westbury LI NY  
Clark Controller 1146 E 152 St Cleveland 10 Ohio  
Clark Cooper Co Market St Palmyra NJ  
Clark Crystal 2 Farm Rd Marlboro Mass  
Clarke Instruments 919 Jesup-Blair Silver Springs Md

Clarostat Mfg Washington St Dover NH  
Pres—Victor Mucher  
Exec VP—George J Mucher  
VP Sls—James Youngblood  
Sls Mgr Dist Div—Fron J Chamberlain  
Pur Agt—Emil O Schramm  
Credit Mgr—Al Wilkens  
Adv Mgr—Austin C Lescorbou  
Export Div—M Simons & Son 25 Warren St New  
York NY  
Atlanta-IDS—James Millar Asso 1036 Peachtree St  
NE Elgin 0919  
Belleville Ill-DS—Herbert Knaggs, 7503 Melbo  
Ave  
Boston-IDS—Henry P Segal Co Inc 143 Newbury  
St Kenmore 6-3012 6-6333 6-9755  
Buffalo-IDS—Leonard D Allen Inc Robert Bush 128  
Knox Ave Woodlawn 1500  
Chicago-DS—Bruce Cumming & Asso 228 N La  
Salle St Andover 3-5837  
Chicago-IDS—Henry Sarkis 6560 N Sheridan Rd  
Hollycourt 5-0883  
Cincinnati-IDS—John O Olsen Co William F  
Needles 4061 Diehl Ave Melrose 1361  
Cleveland-IDS—John O. Olsen Co Richard H  
Vilfroy 16201 Shaker Blvd Wyoming 1-2624  
Columbus-IDS—John O Olsen Co Norbert F Derr  
937 S Ashburton Rd Douglas 2603  
Dallas-IDS—J Y Schoonmoker Co (also W R  
Hays Jr) 2011 Cedar Springs Sterling 3335  
Denver-IDS—W H Connors Co 5532 E Colfax St  
FR 0566  
Detroit-IS—H E Walton Co 76 Kercheval Ave  
Tuxedo 1-5858  
Detroit-DS—Robert Milk Co 19367 James Couzens  
Highway BRoadway 3-2930  
Indianapolis-IDS—Marvin E Nulsen 5376 E Wash-  
ington St Irvington 7664  
Kansas City Mo-DS—A R Thibau Co 402 Mfrs  
Exch Bldg Victor 7057  
Kansas City Mo-IDS—Young & Meyers Co Zell  
Myers 4550 Main St Jefferson 4343  
Los Angeles-IDS—Perlmuth-Colman & Asso 1335 S  
Flower St Richmond 7-5524  
Marion Ind-IDS—Victor Musser P O Box 331 MA-  
rion 835  
Memphis-IDS—Cartwright & Beom 1336 Madi-  
son Ave Memphis 2-1914  
Minneapolis-IDS—A J Warner Co 5022 29th Ave  
S Drexel 1895  
New York-DS—Leon Adelmon Co 25 Chittenden  
Ave Tompkins 7-1145  
New York-IS—Samuel Bialek 205 E 42nd St MU-  
rray Hill 9-2518  
New York-IS (Special Applications) W L Roth  
Control Systems Components 218 E Hartsdale  
Ave Hartsdale NY Scarsdale 5-1050  
Philadelphia-DS—Leban & Grahm 218 Lloyd  
Lane Ardmore 5515-J  
Philadelphia-IS—Clarence W Henderson 1629  
Woodmere Way Havertown Upper Dorby  
Hilltop 6-2832  
Pittsburgh-IDS—Lowry-Dietrich Co 1404 Swantek  
St Walnut 1-2959  
Pittsburgh-DS—John O Olsen Co Ed A Sneysky,  
2046 Brookfield Drive  
Pittsburgh-IS—Paul M Crowman 1262 Shadycress  
Drive  
Roseland NJ-IS—Gowler-Knoop 178 Eagle Rock  
Ave NY Phone Digby 4-8417 NJ Phone  
CAldwell 6-4548  
St. Louis-IDS—Young & Myers Co Ed Young 8147  
Delmar Blvd Delmar 7701  
Seattle-IDS—Samuel N Strom Co 1612 Broadway  
Franklin 7515  
Silver Springs Md-IS—Horry Kreitzner 9204 Second  
Ave Sligo 7550  
Silver Springs Md-DS—Charles Lienau 10203 Mc-  
Kenney Ave  
Syracuse-IDE—Leonard D. Allen Inc 2401 S State  
St Phone 4-4195  
Toronto-IDS—Canadian Marconi Co 830 Bayview  
Ave Midway 0976  
Export ID—M Simons & Son Co Inc 25 Warren St  
New York Barclay 7-5513

Clary Multiplier 408 Junipero San Gabriel Calif  
Clearbeam TV Antenna 100 Prospect Burbank Calif  
Clebar Watch Agency 521 5 Ave New York 17 NY  
Cleco Div Reed Roller Bit 5125 Clinton Houston Texas  
Clement Mfg 6650 S Narragansett Chicago 38 Ill  
Cleveland Container 6201 Barberton Cleveland 2 Ohio  
Cleveland Electronics 6611 Euclid Cleveland 3 Ohio  
Cleveland Wire Cloth 3573 E 78 St Cleveland 5 Ohio  
Clinton Radio & Phono 103 Lafayette New York NY  
Clippard Instr Lab 7390 Colerain Cincinnati 24 Ohio  
Clough-Brengle 6014 Broadway Chicago 40 Ill  
Coast Coil 5352 W Wash Los Angeles 16 Calif  
Coaxial Connector 35 N 2 Mt Vernon NY  
Codetype Labs 550 5 Ave New York 19 NY  
Cohan-Epner 142 W 14 St New York 11 NY  
Cohn Corp Sigmund 121 S Columbus Mt Vernon NY  
Coilcraft 3716 N Cicero Chicago 41 Ill  
Coil Eng'g & Mfg Co Roanoke Ind  
Coil Winders New York Ave Westbury LI NY  
Coil Winding Equip 19 Maxwell Oyster Bay NY  
Cole Instrument 1320 S Grand Los Angeles Calif  
Cole Radio Works 86 Westville Caldwell NJ  
Coleman Cable & Wire 4515 W Addison Chicago 41 Ill  
Coleman Instruments 318 Madison Maywood Ill  
Cole Steel Equip Co 285 Madison New York 17 NY  
Coles Corp 3211 Woodland Phila 3 Pa  
Colgate Mfg Lindenhurst NY  
Collectron Corp 216 E 45 New York 17 NY  
Collins Audio Prods 126 Park Westfield NJ

Collins Jack 9025 N Pelham Pkwy Milwaukee 11 Wisc  
Collins Machine Buchanan NY  
Collins Radio 855 35 NE Cedar Rapids Iowa  
Collyer Insulated Wire Pawtucket RI  
Colonial Films 2118 Mass NW Washington 8 DC  
Colonial Insulator 907 Grant St Akron 11 Ohio  
Color Television 973 E San Carlos San Carlos Calif  
Colorfone Television 238 William New York 38 NY  
Colorvision Plastics 247 Atlantic Boston Mass  
Columbia Electric 4319 Hamilton NE Cleveland 14 O  
Columbia Metal Box 260 E 143 New York 5 NY  
Columbia Pictures 1438 N Gower Hollywood 28 Calif  
Columbia Process Co State & Maple Columbus Ind  
Columbia Records 1473 Barnum Bridgeport 8 Conn  
Columbia Resistors 216 Lafayette New York 12 NY  
Columbia Technical 5 E 57 New York 22 NY  
Columbia Wire & Supply 2850 Irving Park Chicago Ill  
Colvin Labs 12 Court St Morristown NJ  
Comar Electric 3349 Addison Chicago 18 Ill  
Combustion Control 718 Beacon Boston 15 Mass  
Comet Corp McHenry Ill  
Commercial Plastics 2812 W North Chicago 47 Ill  
Commercial Radio Equip 1319 F NW Washington DC  
Commercial Radio Monitoring Box 7037 Kansas City Mo  
Commercial Research 20 Bartlett Detroit 3 Mich  
Communication Accessories Hickman Mills Mo  
Communication Devices 2331 12 New York 27 NY  
Communication Equip 5646 Race Chicago 44 Ill  
Communication Measurements 350 Leland Plainfield NJ  
President—Dono A Griffin  
Vice Pres—William J Hammond  
Ch Engr—Dano A Griffin  
Asst Ch Engr—A H Carr  
Purchasing—B F Rubin  
Boston-Is-Richard Castle H L Hoffman & Co 18  
Tremont St Capital 7-1905 Covers Me-NH-Vt-  
Mass-Ua Conn  
Chicago-IS—R E Sremm 5707 W Lake St Columbus  
1-1546 Covers Ill-Ind-Minn-Wisc  
New York-IS—H L Hoffman Co 110 E 23 St  
GR 3-3022 Covers Lower Conn-NY-Long Island-  
N NJ  
Philadelphia-IS—H L Hoffman Co 1123 Western  
Soving Fund Building PE 5-9966 Covers S NJ-  
Del-E Po  
South Gate Cal-Is—Joe Davidson & Assoc PO Box  
108 New Mnrk 5-7147 Covers Cal-Ariz  
Washington DC-GV—Thomas C Utterback Hedin  
House 2902 Newton St NE Adams 4-6060

Communication Parts 7215 W Irving Pk Chicago 34 Ill  
Communication Products Marlboro NJ  
Communications Co 300 Greco Coral Gables Fla  
Compeo Corp 2251 W St Paul Chicago 47 Ill  
Component Mfrs 11-04 Jackson Long Island City 1 NY  
Computer Corp 149 Church New York 7 NY  
Computer Research Corp Hawthone Calif  
Conant Labs 6500 "0" St Lincoln 5 Nebr  
Concert Halls Soc 250 W 57 New York 19 NY  
Condenser Products 7517 N Clark Chicago 26 Ill  
Condor Radio Mfg 116 N Montezuma Prescott Ariz  
Conn Hard Rubber 407 East New Haven 9 Conn  
Conn Ltd C G Elkart Ind  
Conn Marine Instrument Essex Conn  
Conn Telephone & Electric Meriden Conn  
Connector Corp 6025 N Keystone Chicago 111  
Conrac Inc 19217 E Foothill Glendora Calif  
Consolidated Eng'g 300 N Sierra M V Pasadena 15 Cal  
Consolidated Molded Prods 309 Cherry Scranton 2 Pa  
President—John O'Connell  
VP & Sls Mgr—J W Pillinger  
Binghamton NY-R—105 Highland Ave  
Carmel Ind-R—John R Wainwright P O Box 91  
Phone 1-2102  
Cleveland-R—F W Luther 4500 Euclid Ave Express  
1-0560  
Detroit-R—R J Scothorn 550 Maccobees Bldg Temple  
2-1550  
Marblehead-Mass-R—Roger M Bakey 157 1/2 Jersey St  
MARblehead 3198  
New York City-R-BO—1740 Broadway Judson 6-1700  
Philadelphia-R—James W Simmons 512 Jefferson Bldg  
1015 Chestnut St Market 7-3118  
Stratford Conn-R—F E Kauer 35 Soundview Ave  
BRidgeport 78-0453  
Consolidated Producing 540 W Congress Detroit 26 Mich  
Cons Productions Broward Airport Ft Lauderdale Fla  
Consolidated Radio Prods 350 W Erie Chicago 10 Ill  
Consolidated TV Sunset Blvd at Van Ness Hollywood Cal  
Consolidated Vacuum 735 Ridge Rd W Rochester 3 NY  
Cons Vultee Aircraft 3302 Pac Hwy San Diego Calif  
Cons Wire & Assoc Co's 1635 S Clinton Chicago 18 Ill  
Constable Eng'g J M 101-05 77th Ozone Park 17 NY  
Constantin & Co LL Rt 6 Lodi NJ  
Constantine Eng'g Labs 70 Island Mahwah NJ  
Contact Inc 238 Main Cambridge 42 Mass  
Continental Carbon 13900 Lorain Cleveland Ohio  
President—G F Benkelman  
Exec VP—J W Jira  
Sls Mgr—W M Wood  
Cambridge-IDS—Holliday-Hathaway Inc 238 Main  
St ELiot 4-1751 Covers New Eng- NY (except Met  
NYC)  
Chicago-IDS—Leroy W Beier Co 6518 W North Ave  
BERkshire 7-2420 Covers Ill-Wisc  
Cleveland-IDS—John O Olsen Co 16201 Shaker  
Blvd Wyoming 1-2624 Covers Ohio-Ky-W Po-Wa Va  
Decatur-IDS—V Avis McConvey 212 Mimosa Dr  
CResent 6167 Covers Ga-Fla-N & S Car-Ala-Miss-  
Tenn  
Detroit-IDS—Grant Shaffer Co 16267 James Couzens  
Hwy UNiversity 3-1227 Covers Mich

(Continued on next page)

























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# ALPHABETICAL LISTING of MANUFACTURERS with LOCALIZER INDEX

## Orradio Industries (continued)

- Kansas City—Young & Myers Co 4550 Main St Jeff—4343 and  
St Louis—Young & Myers Co 8147 Delmar Blvd Delmar—7701 Cover Iowa-Mo-Kans-S Ill-SE Neb  
Los Angeles—Erlanger Soles Co 953 S Grand Av Tucker—2379 Covers S Cal incl Son Luis Obispo Kern San Bernardino Cos-Clark Co Ariz-El Paso Texas  
New York—David Sonkin—Lucas Bldg 10 Fiske Pl Mt Vernon MtV—8-9809 Covers Manhattan area  
Philadelphia—Horry Estersohn & Co 7135 Germantown Av Wissahickon—7-1816 Covers Md-DC-Va-E Pa-Def-NJ (except Manhattan area)  
San Francisco—Nickerson & Rudot 383 Brannan St Yukon—2-2982 Covers northern Cal incl Kings Monterey & Invo Cos-Washo Co-Alaska-Hawaii  
Seattle—James J Backer Co 2121 2nd Av Main—8811 Covers Wash-Ore-Idaho-Mont  
Orsyd Co 6602 Walton Detroit 10 Mich  
Orthon Corp 196 Albion Paterson NJ  
Osborn Products Glen Eilyn Ill  
Osborne Transformer 948 E Lafayette Detroit 7 Mich  
Oster Mfg J I Main Racine Wise  
Otis Radio & Electric Hawarden Iowa  
Owen Labs 412 Woodward Pasadena 10 Calif  
Owens-Corning-Fiberglass 16 E 56 St New York NY  
Owens-III Glass Madison & St Clair Toledo 1 Ohio  
Oxford Electric 3911 S Mich Chicago 15 Ill  
Quality Loud Speakers since 1926  
Preferred for original equipment — proven for replacement  
Ozolid Div Gen'l Analine & Film Johnson City NY
- Pacific Electronic Saticoy Calif  
Pacific Electric 3217 Exposition Los Angeles 18 Calif  
Pae Mercury Research, 1500 Mission Canyon Santa Barbara Calif  
Pae Mercury TV Van Nuys Calif  
Pacific Optical 5965 W 98 Los Angeles 45 Calif  
Pacific Scientific 1430 Grande Vista Av Los Angeles 23 Calif  
Pacific Transducer 11921 W Pico Los Angeles 64 Calif  
Pacific Universal Prods 168 Vista Pasadena 8 Calif  
Pacific Vogue TV 1023 E Adams Los Angeles Calif  
Packaged Programs 634 Penn Pittsburgh 22 Pa  
Packard-Bell 12333 W Olympic W Los Angeles Calif  
Page-Fogwell, 1311 Riverside Los Angeles 31 Calif  
Pallard Products 265 Madison New York 16 NY  
Arcadia Calif-SE—Gilbert E Easley 1643 La Ramada Ave  
Chicago-SE—George I Schectman 5036 N Springfield Ave  
Cleveland-SE—John M. Spratt 25941 Lake Shore Blvd  
Houston-SE—Russel A Bird 252 Fauna St  
Washington DC-SE—Vladimir J Wolf 2122 Massachusetts Ave NW  
Paisley Prods 1770 Canalport Chicago 16 Ill  
Palmer Films W A 611 Howard San Francisco 5 Calif  
Palnut Co 61 Cordier Irvington 11 NY  
Pan American Trade Devel 2 Park New York 16 NY  
Panero Mirrors 2958 Los Feliz Los Angeles 39 Calif  
Panoramic Radio Prods 10 S 2 Mt Vernon NY  
Pantek Co Manhattan Beach Calif  
Paper Machinery & Research 1014 Oak St Roselle NJ  
Paragon Electric 1600 12 Twi Rivers Wise  
Paragon-Revolute 77 South Rochester 4 NY  
Paramount Paper Tube Ft Wayne 2 Ind  
Paramount TV Production 127 S Bdry Los Angeles 31 Calif  
Paramount TV Productions Paramount Bldg New York 18 NY  
Paravox Inc 2056 E 4 St Cleveland 15 Ohio  
Parco Co 82 Beaver New York 5 NY  
Parisian Novelty 3510 S Western Chicago 9 Ill  
Park Armature 883 Boylston Boston 16 Mass  
Parker-Kalon 200 Varick New York 14 NY  
Park View TV 435 E 166 St Bronx 56 NY  
Parkwood Laminates Wakefield Mass  
Par-Metal Prods 32-69 49 Long Island City 3 NY  
Par Prods 926 N Citrus Hollywood 38 Calif  
Parsons Productions 6823 Santa Monica Hollywood 38 Calif  
Parts Producing 1861 2 Av New York 28 NY  
Paterson Magnet Wire 132 Beckwith Paterson NJ  
Pathe Industries 6823 Santa Monica Hollywood Calif  
Pathe TV 250 W 57 St New York NY  
Patrick's Industries Ferndale 20 Mich  
Patton-Mae Guyer 201 Chapman Providence RI  
Patwin Instruments 41 Brown Waterbury 20 Conn  
Paul & Beckman 1801 Cortland St Phila 40 Pa  
PCA Electronics 2180 Colo Santa Monica Calif  
Pearce-Simpson Inc 3023 Coral Way Miami 34 Fla  
Pease Co C F 2601 W Irving Plk Rd Chicago Ill  
Peck & Harvey 5650 N Western Chicago Ill  
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Products: Spee-Dee Whiteprinting outfits; speed-master model "S" Ammonia-type Volume-Production Whiteprinter; Verso-Liner Model "D" Plug-In Ammonia-type Production Whiteprinter; Verso-Liner Model "W" Moist Process Volume Production Whiteprinter; Verso-Liner Model "M" Moist Process Plug-In Production Whiteprinter; Verso-Liner "TM" Table Model Moist Process Plug-In Production Whiteprinter; Verso-Printer "P" Table Model Production Whiteprinter;
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broadcasting stations

Questionnaires requesting the names of the technical magazines in the television-radio field doing the best publishing job were mailed to 1,921 chief engineers (the complete listing in the 1953 *Broadcasting Yearbook*) by Magnecord Inc. The returns were mailed back to Magnecord and tabulated by them. No publisher participated in the mailing or tabulation of the survey, or influenced the results in any other way. Number of questionnaires returned: 889 (47%). Here is a tabulation of the results—

<u>Publication</u>	<u>1st Choice</u>	<u>2nd Choice</u>	<u>Total</u>
TELE-TECH	381	247	628
Publication "A"	142	161	303
Publication "B"	95	141	236
Publication "C"	72	52	124
Publication "D"	72	45	117

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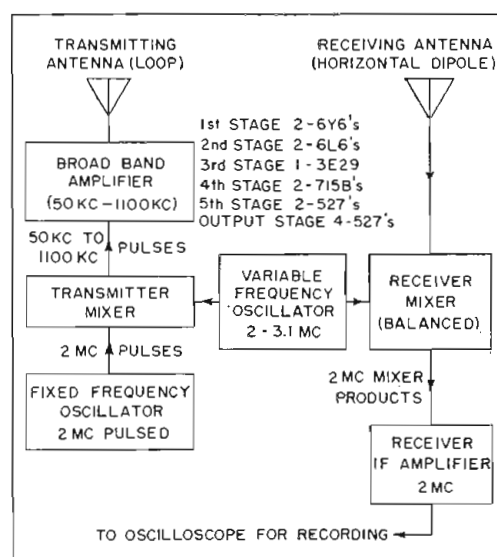
## OMISSIONS

This Electronic Industries Directory has been compiled with the utmost care and thoroughness. Listings have been omitted in all cases where, after three requests, a company has failed to return our questionnaire or otherwise verify its activity.

## Low-Frequency Ionosphere Recorder

As an outcome of the increased interest and demand for more information concerning low-frequency radio propagation phenomena, the National Bureau of Standards has developed a low-frequency recorder to probe the ionosphere. The recorder, developed by J. M. Watts, J. N. Brown, and J. C. Blair of the Bureau's Central Radio Propagation Laboratory, utilizes many of the principles incorporated in high-frequency recording equipment. Its operating frequencies of 50 to 1100 kc are produced by using the beat frequency method of generating wide frequency sweeps.

The transmitter consists of six stages of wide-band amplification (four type-527 tubes are used in the output stage) fed by the output of a mixer. The mixer produces the difference frequency between two oscillators, one a continuous-wave oscillator variable in frequency from 2 mc to 3.1 mc, the other a pulsed oscillator at a fixed frequency of 2 mc. The variable-



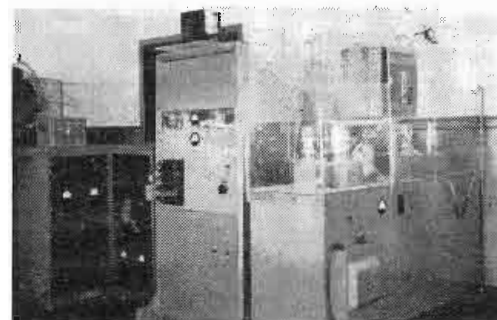
Block diagram of sweep frequency transmitter and receiver used by NBC to probe ionosphere

frequency oscillator is used as the converter in the mixer of the receiver so that reflected pulses are automatically converted to 2 mc, the intermediate frequency of the receiver.

The bandwidth of the low-frequency transmitter amplifier is about 1 mc.

Equalization in all stages produces a response that is reasonably flat from 50 kc to 1 mc measured at the grids of the final amplifier. The power delivered by the final amplifier into a 500-ohm resistive load averages about 1.5 megawatts up to 500 kc and then drops to about 0.5 megawatt for the remainder of the frequency range.

A single loop antenna is used to radiate the energy in a vertical direction. It is suspended between two vertical supports approximately 350 feet long and about 150 feet high. Although a single long-line antenna would perform more efficiently throughout the entire frequency range, a required length of about



Mixing equipment (I), oscillators (next right), and amplifiers (r) used in NBS investigations

9830 feet makes its use prohibitive. In fact, in all low-frequency applications the efficiency of the antenna system must be seriously compromised in order to achieve realizable physical dimensions. Because the transmissions must be vertically directed, rhombics and V-types cannot be utilized. Furthermore, the use of a delta antenna would require a structure several thousand feet high. Measurement of the peak-pulse current of the loop antenna at 100 kc indicates that the radiated power is of the order of 5 watts. In spite of this low value, reflections are frequently recorded at 100 kc during the night hours.

The record of apparent reflection height of the ionosphere layers versus frequency is made by intensity-modulating an oscilloscope beam to which a line deflection type of time base is applied. The line produced is photographed by a camera whose film moves in synchronism with the frequency-change motor of the transmitter and in a direction of travel perpendicular to the time base line. Pips from a 7500-cycle oscillator form horizontal markers on the film which represent 20-kilometer intervals in apparent height.

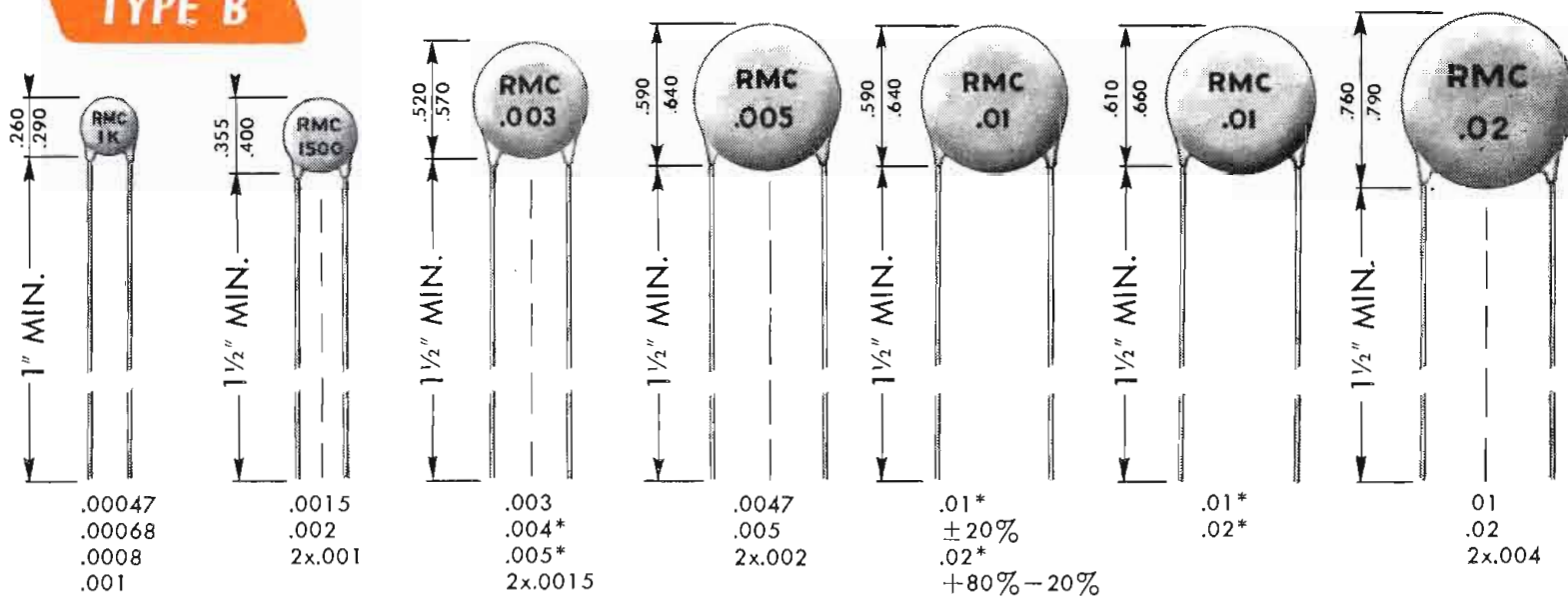
The records obtained in the low-frequency experiments show a diurnal variation. Reflections from the ionospheric E region are apparent at about 100 kilometers above the transmitter. The extraordinary component of the F layer and the ordinary component appear only at night. Occasionally, there appears at night between the E and F layer another trace or group of traces which seems very similar to what have been called E<sub>2</sub>-layer traces when observed on the conventional daytime high-frequency ionosphere record.

# RMC DISCAPS

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## "Heavy Duty" By-Pass DISCAPS

### TYPE B



\*Rated 600 V.D.C.W. Flash test 1200 V.D.C.

### SPECIFICATIONS

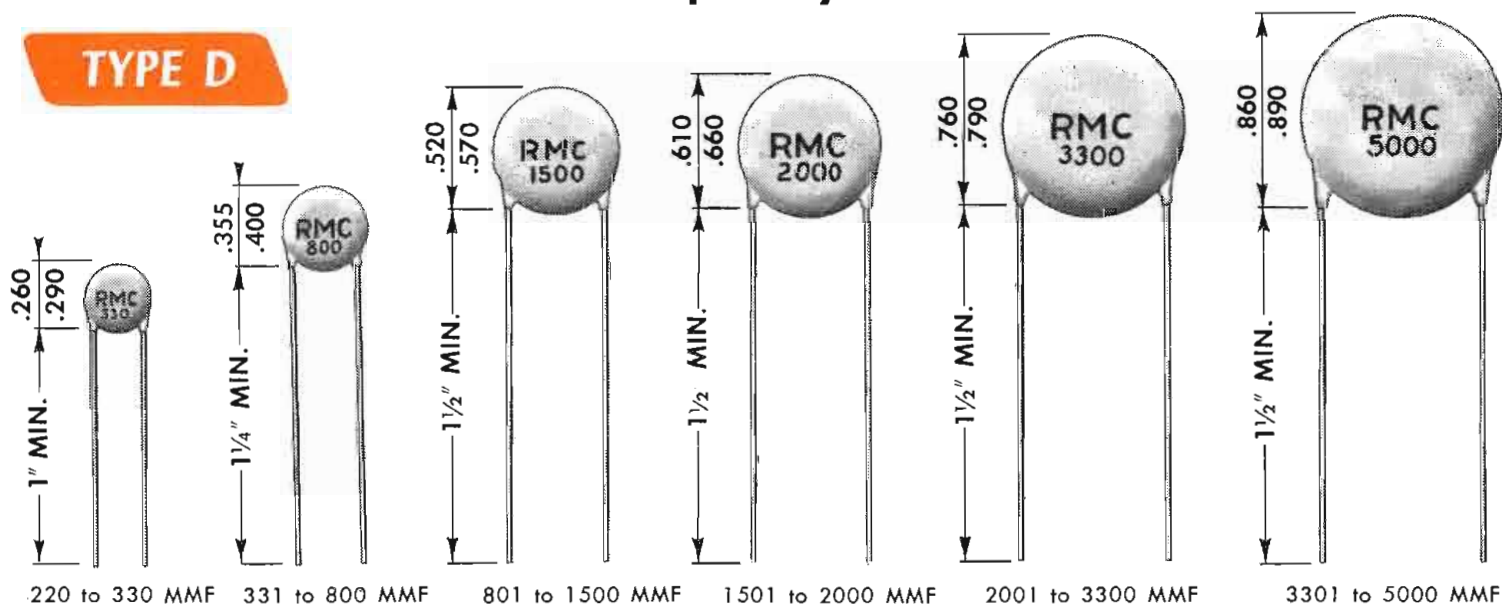
#### TYPE B BY-PASS SERIES—GUARANTEED MINIMUM VALUE

POWER FACTOR: 1.5% Max. @ 1 KC (initial)  
 POWER FACTOR: 2.5% Max. @ 1 KC (after humidity)  
 WORKING VOLTAGE: 1000 V.D.C.  
 TEST VOLTAGE (FLASH): 2000 V.D.C.  
 LEADS: No. 22 tinned copper (.026 dia.)

INSULATION: Durez phenolic—vacuum waxed  
 INITIAL LEAKAGE RESISTANCE: Guaranteed higher than 7500 megohms  
 AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms

## "Stable Capacity" DISCAPS

### TYPE D



### SPECIFICATIONS

POWER FACTOR: 1% Max. @ 1 K C (initial)  
 POWER FACTOR: 2.5% Max @ 1 K C, after humidity  
 WORKING VOLTAGE: 1000 V.D.C.  
 TEST VOLTAGE (FLASH): 2000 V.D.C.  
 LEADS: No. 22 tinned copper (.026 dia.)

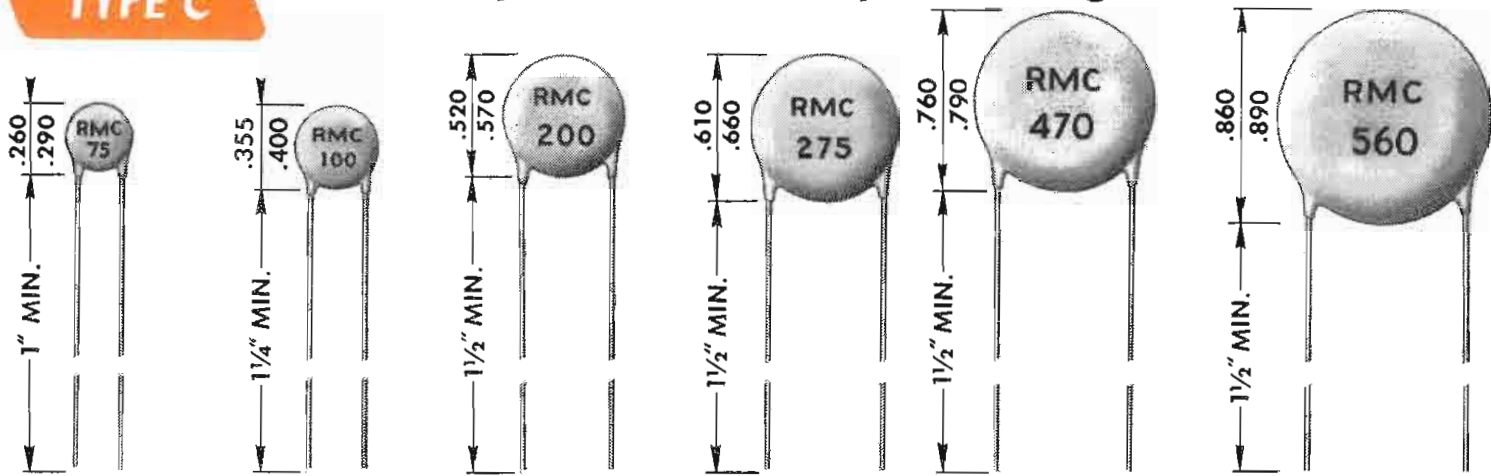
INSULATION: Durez phenolic—vacuum waxed  
 INITIAL LEAKAGE RESISTANCE: Guaranteed higher than 7500 megohms  
 AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms

CAPACITY TOLERANCE: ± 20% at 25° C or G.M.V.

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## TYPE C

## Temperature Compensating DISCAPS



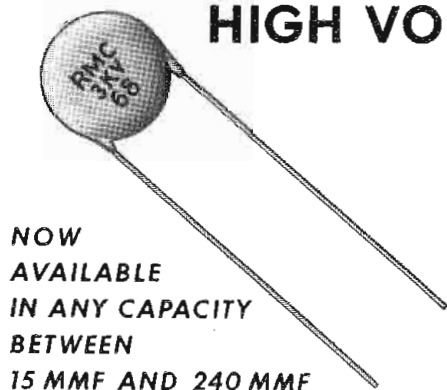
TC	1/4 Dia.	5/16 Dia.	1/2 Dia.	5/8 Dia.	3/4 Dia.	7/8 Dia.
P-100	1- 3 MMF	4- 9 MMF	10- 30 MMF	—	—	—
NPO	2- 12	13- 27	28- 60	61- 75 MMF	76-100 MMF	101-150 MMF
N- 33	2- 15	16- 27	28- 60	61- 75	76-100	101-150
N- 80	2- 15	16- 27	28- 60	61- 75	76-120	121-150
N- 150	2- 15	16- 30	31- 60	61- 75	76-140	141-150
N- 220	3- 15	16- 30	31- 75	76-100	101-150	151-190
N- 330	3- 15	16- 30	31- 75	76-100	101-150	151-190
N- 470	3- 20	21- 40	41- 80	80-120	121-200	201-240
N- 750	5- 25	26- 56	57-150	151-200	201-280	281-350
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N-2200	47- 75	76-120	121-200	201-275	276-470	471-560

### SPECIFICATIONS

POWER FACTOR: Less than .1% at 1 megacycle  
 WORKING VOLTAGE: 1000 V.D.C.  
 TEST VOLTAGE (FLASH): 2000 V.D.C.  
 CODING: Capacity, tolerance and TC stamped on disc  
 INSULATION: Durez phenolic-vacuum waxed

INITIAL LEAKAGE RESISTANCE: Guaranteed higher than 7500 megohms  
 AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms  
 LEADS: #22 tinned copper (.026 dia.)  
 TOLERANCES:  $\pm 5\%$   $\pm 10\%$   $\pm 20\%$

## HIGH VOLTAGE DISCAPS—Designed for Deflection Yokes



### SPECIFICATIONS

POWER FACTOR: .1% Max. @ 1 M C (initial)  
 POWER FACTOR: 2.5% Max. @ 1 M C, after humidity  
 WORKING VOLTAGE: 2000, 3000, 4000, 5000 V.D.C.  
 TEST VOLTAGE: 4000, 6000, 8000, 10,000 V.D.C.

LEADS: No. 22 tinned copper (.026 dia.)  
 INSULATION: Durez phenolic—vacuum waxed  
 INITIAL RESISTANCE: Guaranteed higher than 7500 megohms  
 AFTER HUMIDITY LEAKAGE RESISTANCE: Guaranteed higher than 1000 megohms  
 AVAILABLE TOLERANCE:  $\pm 5\%$   $\pm 10\%$   $\pm 20\%$

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THE AUGUST WEST COAST ISSUE

of

# TELE-TECH

&

## ELECTRONIC INDUSTRIES

### HIGHLIGHTS

● **Editorial Coverage of Every Phase of West Coast Activity**—research and development, manufacturing, aviation electronics, motion pictures, computers, tubes, components, test equipment, broadcasting and video recording—civilian and defense . . . news and technical articles.

● **Annual Wescon Meet . . .** complete up-to-the-minute review of the program . . . lists of technical papers . . . announcements of special meetings, tours, etc. . . . new items introduced at the show . . . list of Show exhibitors, etc.

● **A Special West Coast Electronic Industries Directory . . .** containing names, addresses, top personnel, and telephone numbers of West Coast electronic manufacturers.

● **West Coast Electronic Industries in Review . . .** exclusive statistical analysis of each branch of the industry . . . general review article on West Coast electronic engineering . . . forecast for coming year.

● **West Coast Electronic News . . .** of professional and trade societies . . . personalities . . . plant expansions . . . new product . . . new literature, etc.

### REACHES

**21,000 TOP**

**ELECTRONIC ENGINEERS—**

This looked-forward-to, thoroughly read West Coast Issue reaches the 21,000 top engineers in every part of the vast electronic industry throughout the nation. Through the pages of TELE-TECH, you can reinforce your personal selling to these engineers—the men who specify your products.

Remember: special distribution at WESCON—1953, August 19-21. Closing date: July 1.

**RESERVE YOUR SPACE NOW!**

CALDWELL-CLEMENTS, INC. 480 LEXINGTON AVENUE NEW YORK CITY, 17

**TV STATION DATA (Continued)**

N. DAK.	Fargo	WDAY-TV	6	Black Bldg.	207-5th St. N.	Fargo	Tom Barnes	Julius Heiland	AD	65	32.5	10	392	2	1	740
<b>OHIO</b>	Cleveland	WXEL	9	1630 Euclid Ave.	1630 Euclid Ave.	4501 Pleasant Valley Rd., Parma	Franklin Snyder	H. A. Brinkman	AD	25.6	13.4	5	725	14	1	
	Dayton	WIFE	22	5 S. Jefferson	Lima	Dayton	Robert Mack	A. J. F. Smith	CDN	200	100	11	500	2	1	
	Lima	WIMA-TV	35	223 N. Main St.	Lima	1424 Rice Ave.	R. O. Runnersstrom	Darrel Hunter		20	3	5	340	1	0	5
	Massillon	WLOK-TV	73	National Bank Bldg.	Lima	1424 Rice Ave.	Jim Bushman	Jay Lebach		95	50	1	500	2	0	80
	Sandusky	WMAC-TV	23	610 First National Bank	Cleveland & Huntington	Cleveland & Huntington	Jay Wagner	R. E. Hardy		18.2	9.1	1	265	1	0	154
	Warren	WLEC-TV	42	Cleveland & Huntington	Cleveland & Huntington	Youngstown Rd. at Ridge Ave.	C. J. Raymond	F. A. Dieringer	N	86	86	12	502	0	0	
	Youngstown	WHHH-TV	67	2nd Nat'l. Bank Bldg.	Cleveland & Huntington	Youngstown Rd. at Ridge Ave.	W. F. Maag, Jr.			175	89	10	960	4	0	
	Youngstown	WFMJ-TV	73	101 W. Boardman St.	101 W. Boardman St.											
<b>PA.</b>	Easton	WGLV	57	48 N. 4th St.	Gaffney Hill	Gaffney Hill	N. S. Rounsley	C. R. Thon	AD	100	66	5	1,093	2	1	
	Harrisburg	WTPA	71	219 Walnut St.	Blue Mt.	Blue Mt.	D. J. Bennett	P. D. Gross		174	94	10	987	3	0	
		WHP-TV	55	216 Locust St.	Blue Mt.	Blue Mt.	A. K. Redmond	E. D. Leibensperger	C	253	126	10	920	4	2	40
	New Castle	WKST-TV	45	Cathedral Bldg.	New Castle	New Castle	A. W. Graham	Donald Dout	D	20	10	1	1,608	0	0	27
	Philadelphia	WIP-TV	29	35 S. 9th St.	Waverly Rd.	Waverly Rd.	Benedict Gimbel, Jr.	C. C. Harris		275	135	12	800	3	0	553
	Pittsburgh	WENS	16	Oliver Bldg.	700 Ivory Ave.	700 Ivory Ave.	A. D. Faust	J. E. McCormack	A	200	106	12	858	4	2	84
	Reading	WHUM-TV	61	Skyline Dr.	Summit Station	Summit Station	H. J. Greig	T. S. Fnech	C	260	135	12	1,766	2	1	16
	Wilkes-Barre	WRLK-TV	34	88 N. Franklin St.	Penobscot Mt.	Penobscot Mt.	T. P. Shelburne	G. L. Sherman	AD	250	250	12	1,040	2	1	
	Williamsport	WRAT-TV	36	244 W. 4th St.	Ridge Rd.	Ridge Rd.	G. E. Joy	Willis Weaver	D	20.6	.5	1	1,281	2	0	187
	York	WNOW	49	25 S. Duke St.	RD. No. 9	RD. No. 9	L. W. Williams			100	50	5	660	2	0	
<b>S. CAR.</b>	Charleston	WGSC-TV	5	Francis Marion Hotel	E. Bay & Charlotte St.	E. Bay & Charlotte St.	J. M. Rivers	Wilbur Albee	ACDN	30	15	5	520	3	1	11
	Columbia	WNOK-TV	67	1811 Main St.	Cushman Dr.	Cushman Dr.	H. M. McElveen, Jr.	D. E. Willoughby	CD	78.6	39.3	5	624	2	1	28
	Greenville	WVFL	23	Calhoun Towers	Greenville	Greenville	B. K. McKinnon	E. A. Sellars	ACDN	22	11.1	1	1,142	0	0	
<b>TENN.</b>	Johnson City	WJHL-TV	11	145 W. Main St.	Tannery Knob	Tannery Knob	W. H. Lancaster, Jr.	O. K. Garland	ACDN	58.78	29.39	5	716	2	0	10
	Memphis	WMCT	5	165 Madison Ave.	Memphis	Memphis	H. W. Slavick	E. C. Frase, Jr.		60	30	25	650	4	3	195
<b>TEX.</b>	El Paso	KEPO-TV	13	2419 N. Piedras	Mt. Franklin	Mt. Franklin	Miller Robertson	E. L. Gemoets	A	120	60	10	1,000	2	1	15
	Houston	KTSM-TV	9	801 N. Oregon St.	3rd and Santa Fe St.	3rd and Santa Fe St.	K. O. Wyler	K. J. Walton	N	58	29	10	500	4	0	20
	Lubbock	KNUZ-TV	39	Houston	Houston	Houston	D. H. Morris	O. C. Crossland		100	50	5	748	2	0	
	Lubbock	KDUB-TV	13	7400 College Ave.	7400 College Ave.	7400 College Ave.	W. D. Rogers, Jr.	T. W. Kirksey	CDP	35	17.5	5	852	4	1	20
<b>VA.</b>	Danville	WBTM-TV	24	Ridge & Grove Sts.	Ridge & Grove Sts.	Whiteoak Mt.	E. G. Gardner	L. C. Motley		225	225	120	647	1		95
<b>WASH.</b>	Bellingham	KVOS-TV	12	1321 Commercial St.	Yew St.	Yew St.	Jack Clark	Ernest Harper		34	17	6	1,042	0	0	11
	Tacoma	KMO-TV	13	914 1/2 Broadway	5544 N. Highland	5544 N. Highland	Jerry Geehan	J. L. Boor	CD	120	72	10	784	2	1	200
	Tacoma	KTNT-TV	11	948 S. Grant St.	1701 S. 11th St.	1701 S. 11th St.	L. H. Higgins	M. H. Bice		29.5	15	5	450	2	0	275
	Yakima	KIMA-TV	29	P. O. Box 702	Terrace Hgls. Blvd.	Ahlanum Ridge Rd.	T. C. Bostic	J. B. Watkinson	C	10.8	6.5	1	966	2	1	
<b>WISC.</b>	Neenah	WNAM-TV	42	101 E. Wisconsin Ave.	County Trunk A	County Trunk A	D. C. Wirih	E. W. Fiegel		20	10	1	330	2	0	5

**TELE-TECH**

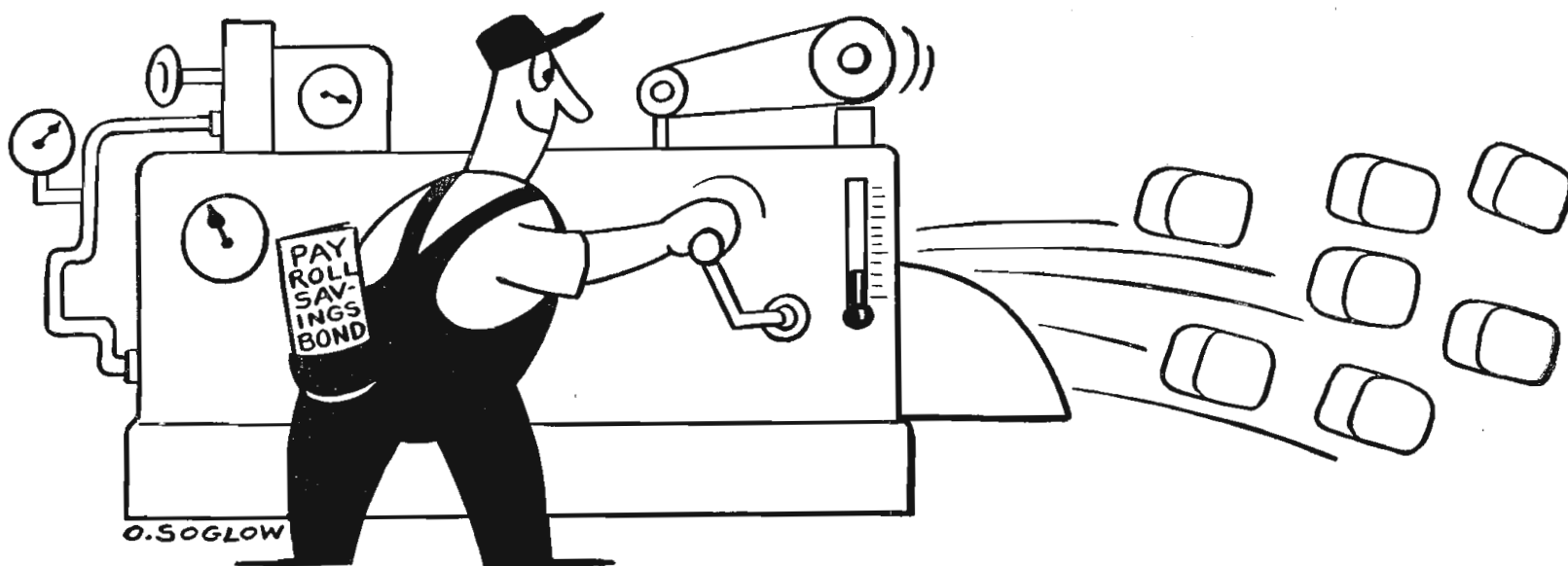
ELECTRONIC INDUSTRIES

**210000****CIRCULATION GUARANTEED**

Because of the lag in auditing, never catching up with current circulation in an expanding industry, an audit for the calendar year 1953 will not be made until the summer of 1954. Meanwhile, sworn statements and post office receipts will be furnished covering the guaranteed circulation.

In this directory the listing of manufacturers' names in capital letters signifies that the manufacturers also have advertisements in this issue.

In the Alphabetical Listing of Manufacturers with the new and exclusive Localizer Index, the indented light face listings are advertisements.



Boost your employee-participation in the Payroll Savings Plan and you boost your production!

You are skeptical? Then consider this logic: The more U. S. Savings Bonds an employee holds, the more secure he feels. The more secure he feels, the greater his peace of mind—the more contented he is with his job. Results? Less absenteeism, less labor turnover, fewer accidents. *End result: increased production.*

And you needn't depend on theory alone. For those company benefits of the Payroll Savings Plan are borne out in the experience of more than 20,000 companies promoting the Plan.

**LONG-RANGE BENEFITS, TOO**

Bond sales spread the national debt,

thus increasing our national economic security. And, of course, what's good for that is also good for you and your business.

The individual Bond Buyer gets back \$4, when his Bonds mature, for every \$3 he invested. That's a boon for him, and—multiplied by millions of Bond holders—represents a huge backlog of purchasing power that will help assure national prosperity through the years ahead.

**IT'S EASY TO BOOST PARTICIPATION**

1. See that a top management man sponsors the Plan.
2. Secure the help of the employee organizations in promoting it.
3. Adequately use posters and leaflets

and run stories and editorials in company publications to inform employees of the Plan's benefits to them.

4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Nation-wide experience indicates that 50% of your employees can be persuaded to join—without high-pressure selling. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. He is listed in your phone book.

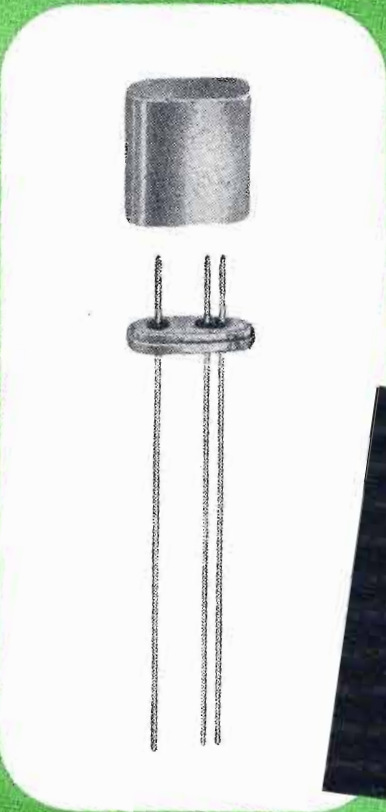
*The Treasury Department acknowledges with appreciation the publication of this message by*

**CALDWELL-CLEMENTS, INC.**



*This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.*

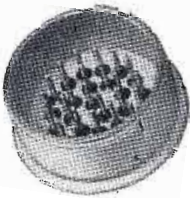




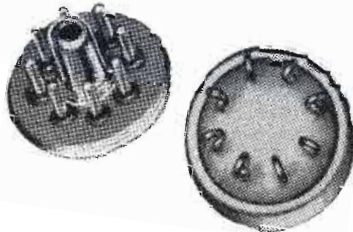
## Glass to Metal Vacuum Seals

### Constantin's latest achievement —

Glass to metal vacuum sealed transistor mounts that provide complete protection from moisture, dust, varying heat conditions and shock. Germanium can be sealed in vacuum or inert gas. A special soldering moat is a feature for easy assembly. Leads are spaced to fit standard sub-miniature sockets and can be supplied 1½" long for soldering directly to circuits.



**AN CONNECTORS**  
Precision construction throughout. Glass to metal vacuum seal assures protection against varying atmospheric conditions. Available in most JAN specifications.



**MULTIPLE HEADERS**  
Plug and standard types. Built to withstand thermal shock and provide stabilized atmospheres. Available in various configurations.

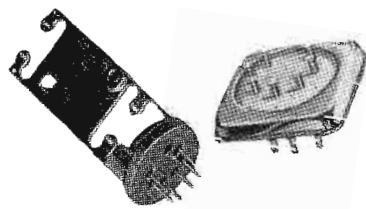


**SINGLE TERMINALS AND END SEALS**  
Terminals available in all combinations of hooks, eyes, tubes, and pierced flats. Test rated from 1,000 to 15,000 volts R.M.S and 5 to 25 amps. Single end seals available in various sizes for items requiring stabilized atmospheres.

## HIGH COMPRESSION SEALS AVAILABLE



**CRYSTAL HOLDERS**  
The highly rigid metal bridge unit is designed to withstand severe strain without deformation. The one piece sealing medium minimizes stresses on the pins which could produce internal strain.



**CUSTOM ENGINEERED COMPONENTS**  
Constantin is capable of manufacturing any glass to metal sealed requirement. Free engineering assistance given upon request.

Hot fin plating at 530°F. facilitates easy soldering, thereby eliminating rejections during assembly. Special plating supplied on request. Glass to Kovar seals, made under Westinghouse patents, are ideal for use in extreme temperatures. Blueprints can be furnished upon request.

### VACUUM COATING EQUIPMENT

#### COMBINATION BASE AND FINAL FREQUENCY CALIBRATION PLATING MACHINE FOR QUARTZ CRYSTALS — Model 3

Precision equipment designed to deposit micro-tolerance film of metal (gold, silver, platinum, etc.) on quartz crystal oscillator plates. Operates at vacuum of less than 1 100 micron.

#### MANIFOLD TYPE FINAL FREQUENCY CALIBRATION UNIT TYPE FFO — Model 4

Unit is engineered to calibrate one crystal every 15 seconds with vacuum of less than 1/2 micron. May be bench mounted in multiples.

## L.L. Constantin & Co.

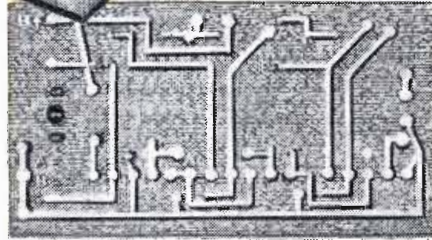
### MANUFACTURING ENGINEERS

Rt. 46 and Franklin Avenue Lodi, N. J.

A completely self-contained company equipped with the most modern machine shop and facilities for die construction, stampings, bending, and wire cutting. Also a Glass Department capable of compounding, tableting and sintering. Latest ovens and furnaces for fusing. Advanced plating techniques. Skilled Engineering. These combined features enable us to provide a TOP QUALITY product completely manufactured on our premises. Product or sample delivery can be made almost immediately.



**WHY  
WIRE?**



- Lower Wiring Costs
- Reduced Assembly Time
- Circuit Reproducibility
- Improved Reliability
- Miniaturization ... are assured with

**"PHOTOCIRCUITS PRINTED CIRCUITS"**

**PACKAGED**

**Electronic Sub-Assemblies**

**... to your specifications!**

Let us quote on manufacturing your sub-assemblies. Use our complete production facilities for **PRINTING • ETCHING • PLATING • LAMINATING • FABRICATING • MACHINING • FORMING • ASSEMBLING • DIP SOLDERING • ENCAPSULATING ...** as well as **DESIGN DEVELOPMENT • ENGINEERING • DRAFTING.**

For full information  
call or write

*photocircuits*  
CORPORATION

Dept. TT6, GLEN COVE, NEW YORK

Glen Cove 4-4000 • Flushing 3-5050

Pioneers in Cost-Cutting  
Printed Circuit Techniques

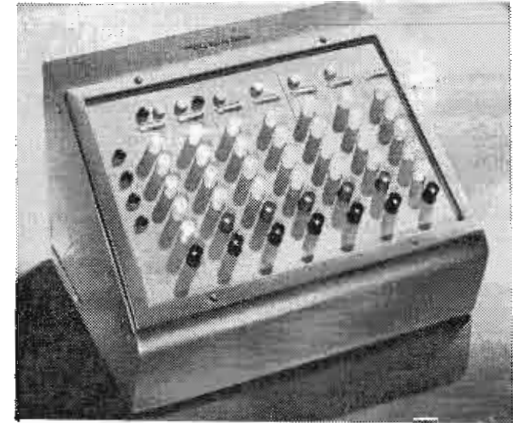


\*Trade Mark

BOSTON: 25 HUNTINGTON AVENUE • Copley 6-7705  
CHICAGO: 4258 W. IRVING PARK RD. • Palisades 5-1170  
PHILADELPHIA: 1531 SPRUCE STREET • Kingsley 5-1205  
ROCHESTER, N. Y.: 3 JUNIPER STREET • Culver 7635  
TORONTO, CAN.: 290 LAWRENCE AVE., W. • Orchard 3003

**Cordless Switchboard**

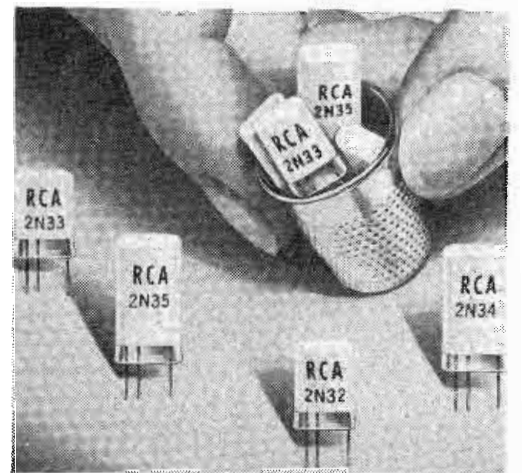
A cordless switchboard to interconnect a telephone system with a mobile two-way radio system, microwave system or power line carrier system is especially suited to dispatching for Miscellaneous Common Carrier (MCC) services. It interconnects any one of five subscriber common battery telephone lines to a two-way radio system by simply pressing a button to select the de-



sired circuit. Simultaneous conversations may be carried on over each of four independent talking channels. Additional features include provisions for connection of an external ringer. The unit operates with a standard desk-type telephone instrument or an operator's type headset. The switchboard is only 11¾ x 9½ x 7 in.—Motorola Communications and Electronics, Inc., 900 N. Kilbourn Ave., Chicago 51, Ill.—TELE-TECH & ELECTRONIC INDUSTRIES

**Transistors**

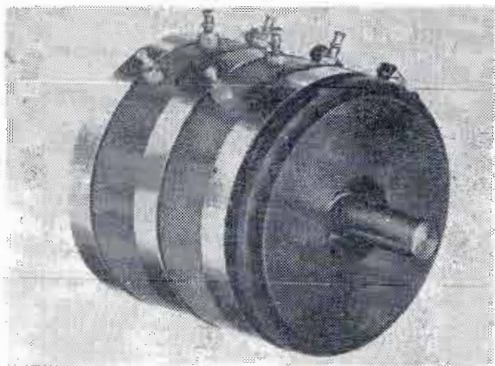
Two point-contact and two junction types of RCA transistors are now in production, initially running into thousands per month. RCA-2N32: a point-contact type intended for large-signal applications such as in pulse or switching service, in electronic computers and counters and on-off control devices.



Suggested user price: \$15.40. RCA-2N33: a point-contact type intended for use as an oscillator at frequencies up to 50 MC. Suggested user price: \$23. RCA-2N34: a P-N-P junction type designed for low-power, audio-frequency applications. Suggested user price: \$13.40. RCA-2N35: an N-P-N junction type also designed for low-power, audio-frequency applications. Suggested user price: \$18.40. All units are plastic encased to provide protection against shock and moisture.—RCA Victor Div., Tube Dept., Radio Corp. of America, Harrison, N. J.—TELE-TECH & ELECTRONIC INDUSTRIES

**Precision Potentiometer**

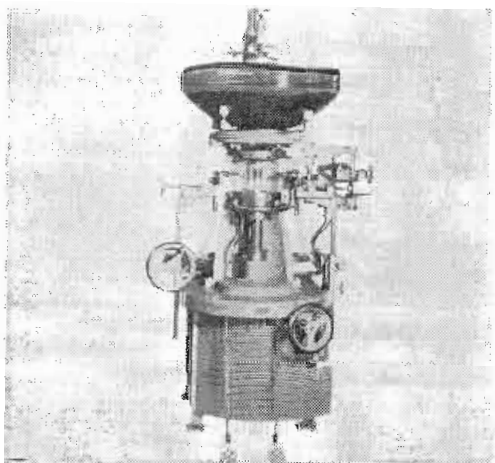
Only 1¾ in. in diameter and weighing only 3 oz., the Model Y Series Helipot is available in five mounting styles. For many uses where manual operation is required, a threaded bushing mount is available. For automatic control, as in servo computer systems, it is available with servo flange mounting, or with two-hole servo mounting. Both types of servo mount are available with either sleeve bearings or ball bearings. Units may be furnished with as many as 14 sections ganged on a single shaft; as many as 17 taps per section may be made, and are



available from 50 to 50,000 ohms resistance, with 2½ watt power rating, with tolerances as low as ±0.25% on special order.—**Helipot Corp., South Pasadena, Calif.—TELE-TECH & ELECTRONIC INDUSTRIES**

### Machine Speeds Up TV Tube Salvage

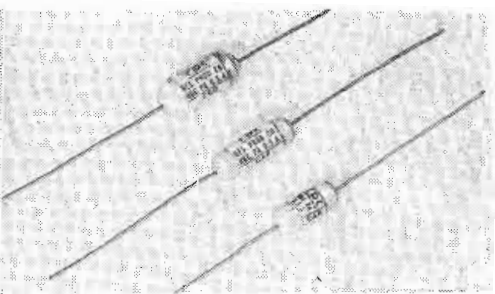
A combination neck cutting and neck splicing machine salvages 24, 27, 30, 33 in. and up cathode-ray picture tubes. All operations are performed with one bulb handling. Rejected tubes are easily and rapidly returned to the assembly line. Model 2185 is a single head machine that takes all standard



sizes and shapes. The neck cutting operation is performed by the hot-chill method, producing a clean, square cut. Neck splicing operation incorporates an upper centering chuck which automatically lines up the bulb if part of the neck remains. Fires move up and down, in and out; and are controlled by a foot operated economizer. A hold-down attachment is used where the neck is gone entirely. Gun sealing can be accomplished with a special gun-mount pin.—**Kahle Eng'g. Co., 1307 Seventh St., North Bergen, N. J.—TELE-TECH & ELECTRONIC INDUSTRIES**

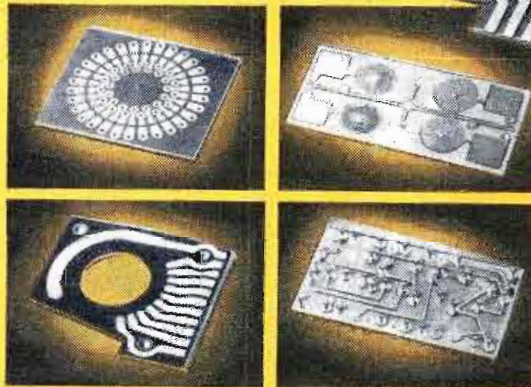
### Wirewound Resistor

Midget precision wirewound resistors of small size and light weight are self-supporting. They are especially useful in aircraft applications. They are made in the following sizes: ½ in. long x 9/32 in. diam.; ¾ in. long x 9/32 in. diam.; ¾ in. long x ⅜ in. diam. The Type C resistors are completely insulated and enclosed in rugged plastic



jacket. Steatite winding forms have high insulation with low coefficient of expansion. Windings are impregnated in special compound with protection against dust, salt spray, humidity and mechanical damage.—**Resistance Products Co., 714 Race St., Harrisburg, Penna.—TELE-TECH & ELECTRONIC INDUSTRIES**

## Q. WHY WIRE?



A. Cut Production Costs with

# "photocircuits"

## PRINTED CIRCUITS"

and Dip-Soldered Electronic Sub-Assemblies

**CREATE competitive PROFIT advantages** through lower wiring costs, reduced assembly time, exact reproducibility of circuits, improved reliability, and miniaturization!

Here are a few answers to questions asked about Photocircuits Printed Circuits:

Q. How much less cost?

A. Reductions to over 50% in wiring costs alone have been experienced by manufacturers.

Q. How few "printed circuits" can be bought profitably?

A. As few as 10 circuits are frequently used with profit.

Q. What "printing" methods are used?

A. Any of several well-known printing processes can be used... of which photography, silk screening and offset printing are a few.

Q. Can "cross through" connections on 2-sided printed circuit chassis be made?

A. Yes, by electroplating... to eliminate costly hardware and assembly time... and to assure greater reliability.

Q. What applications are most generally suited for Photocircuits Printed Circuits?

A. Applications extend to Micro-wave plumbing, Radio and TV chassis, I.F. strips, Antenna filters, Terminal boards, Wiping switches, Flush commutators etc.

For full information call or write



This Engineering Brochure FREE on request.

# photocircuits

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PHILADELPHIA: 1531 SPRUCE STREET • KINGSley 5-1205

ROCHESTER, N. Y.: 3 JUNIPER STREET • CULver 7635

TORONTO, CAN.: 290 LAWRENCE AVE., W. • ORchard 3003

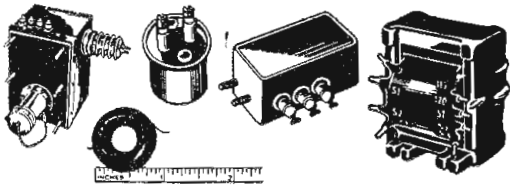


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Pioneers in NEW, widely used LESS-WIRING TECHNIQUES

# FREED

## TRANSFORMERS



### MILITARY COMPONENTS TO SPECIFICATIONS MIL-T-27 & ANE-19 AND COMMERCIAL TYPES

- Pulse Transformers
- Filter Reactors
- Charging Reactors
- Saturable Reactors
- Toroid Inductors
- Low Pass Filters
- High Pass Filters
- Band Pass Filters
- Discriminators
- Plate Transformers
- Power Transformers
- Filament Transformers
- Vibrator Transformers
- Input Transformers
- Interstage Transformers
- Driver Transformers
- Output Transformers
- Modulation Transformers
- Blocking Oscillator Transformers
- Band Elimination Filters

## INSTRUMENTS



**NO. 1020 B  
MEGOhMMETER  
DIRECT READING**

Self-contained and A.C. operated with electronically regulated supply. 1 megohm to 2 million megohms.



**NO. 1010  
COMPARISON  
BRIDGE**

Self-contained and A.C. operated. For rapid and accurate test of Resistors, Condensers and Inductors.

#### OTHER FREED INSTRUMENTS

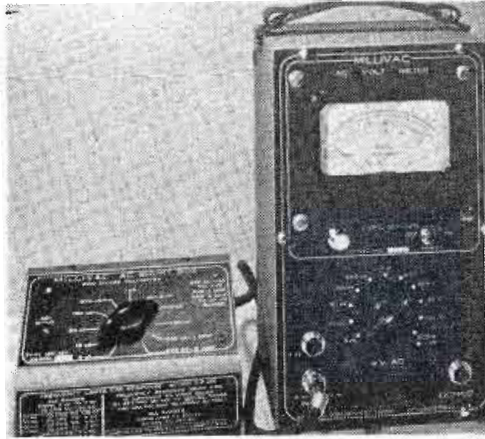
- NO. 1030** Low Frequency Q. Indicator
- NO. 1110A** Incremental Inductance Bridge
- NO. 1150** Universal Bridge
- NO. 1170** D.C. Supply
- NO. 1210** Null Detector and Vacuum Tube Voltmeter
- NO. 1140** Null Detector Amplifier
- NO. 1040** A.C.—V.T. Voltmeter
- NO. 1250** Decade Condenser
- NO. 1410** Harmonic Distortion Meter and Decade Inductors

Send for Complete Catalog describing all Freed Instruments and Transformers

**FREED TRANSFORMER CO., INC.**  
1726 Weirfield St., Brooklyn (Ridgewood) 27, N.Y.

### AC Shunt Box

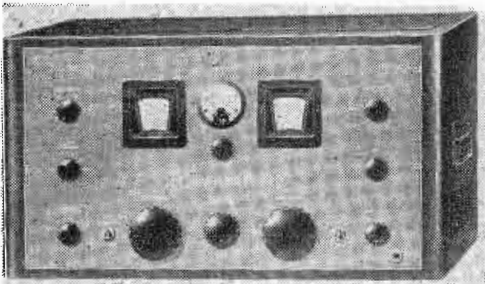
The new shunt box type MV-121 (left in photo), converts the MV-12A voltmeter into a highly-sensitive ac ammeter, covering an unusually wide frequency range. Frequency response is within 0.2 db—20 CPS to 250 KC, 1 A range, 20 CPS to 100 KC, 3 A range—20 CPS to 6 KC. The new unit is particularly



useful if an oscilloscope is plugged into the output terminal of the MV-12A ac voltmeter because this makes it unusually simple and easy to observe wave-shapes of currents.—**Milivac Instrument Corp.**, Box 997, Schenectady, N. Y.—TELE-TECH & ELECTRONIC INDUSTRIES

### Communications Receiver

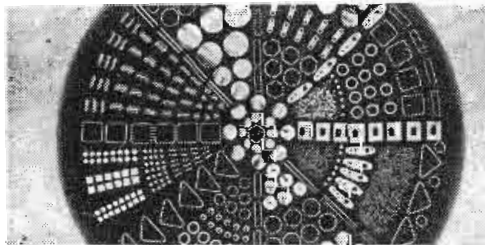
The HQ-140-X general-purpose super-heterodyne communications receiver with a self-contained power supply is being produced for use by commercial operators, amateurs and other shortwave listeners. The table-top type receiver has a continuously tunable frequency range from 540 kc to 31 MC (555 to 9.7 meters) in six bands. Tuning is available on the four higher frequency



ranges, with direct calibration for the 80, 40, 20, 15 and 10 meter amateur bands. To tune other ranges, calibration charts can easily be made for use with the arbitrary bandspread logging scale. Either headphones or loudspeaker can be used. Automatic volume control aids in keeping music and voice reception at the desired level.—**Hammilund Mfg. Co., Inc.** 460 W. 34 St., New York 1, N. Y.—TELE-TECH & ELECTRONIC INDUSTRIES

### Solder Pre-Forms

Photo shows a few of the many possible types of solder pre-forms termed "Solderforms" now available. "Solderforms" comprise any desired tin-lead alloy, with or without a flux, and made up in any required shape such as a ring, disc, pellet, washer or spring. Other metal components can be included if required, as in the case of soldering germanium diodes, where silver is added



to the basic alloy. Any of the usually accepted methods of applying solder such as flame, carbon resistance, oven, hot-plate, induction heating, infra-red, or a conventional soldering iron, can be employed.—**Kester Solder Co.**, 4201 Wrightwood Ave., Chicago 39, Ill.—TELE-TECH & ELECTRONIC INDUSTRIES

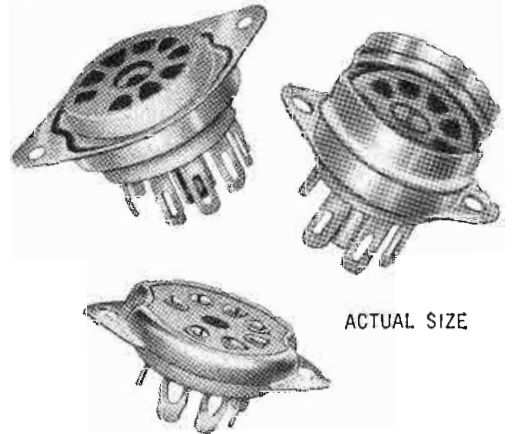
# ELECTRICAL INSULATION THAT WILL TAKE 2000° F. FOR BRIEF PERIODS!

Aircraft fire detection apparatus needs that. Here is the Mycalex glass-bonded mica part that has it.

Mycalex 410 molded with steel ring inserts for thermo-coupling device produced by **Thomas A. Edison, Inc.**



• For permanent endurance Mycalex can take 650°F. continuously without heat distortion or any other injury.



ACTUAL SIZE

Mycalex is superior for high voltage, high frequency components that must operate in small spaces.

For example, tube sockets like these — now used in over 60% of all television receiver tuners. — Manufactured and sold by **Mycalex Tube Socket Corporation**, Clifton, N. J.

*If your insulation must take heat or get rid of heat, investigate Mycalex!*

WRITE FOR ENGINEERING DATA BOOK



**MYCALEX CORPORATION of AMERICA**

World's Largest Manufacturer of Glass-bonded Mica Products

Executive Offices: 30 Rockefeller Plaza, New York 20, N.Y.

GENERAL OFFICES AND PLANT

112 CLIFTON BOULEVARD, CLIFTON, NEW JERSEY

## Changes at Helipot

Helipot Corp. has opened a new plant at 721 Junipero Rd., San Gabriel, Calif. which has 17,000 sq. ft. of floor space. William B. Semple is works manager. Pre-production, formerly located in a temporary building on Mission St. in South Pasadena, has been moved to the company's No. 1 Plant in the same city.

## A TV in Every Hotel Room

The purchase of 4,000 TV sets for installation in 14 eastern hotels of the Sheraton chain was announced recently. The 4,000 sets constituted an initial order from RCA, and the hotel chain will require several thousand more receivers for hotels in other cities. Sheraton's plan provides for the installation of an RCA Victor TV 17-in. receiver in every guest room in all of their hotels within range of TV service. Sheraton President Ernest Henderson noted that many people have become so accustomed to television service that they are unwilling to do without it, even when spending a few days in a hotel.

## CBS-TV Inaugurates Newsfilm Department

CBS-TV has placed in operation a Newsfilm Department which will provide daily coverage of events around the world. Although functioning as a separate unit, it will be integrated with the established news staffs of the network. Future plans envision making the complete service available to TV stations on a syndicated basis. Manager of the new department is E. C. Buddy, formerly foreign editor for Paramount and Pathe Newsreels. Operations manager is Karl MacIlvaine; national editor is Chester Burger; and foreign editor is Frank F. Donghi.

## QUEEN of COLOR-TV

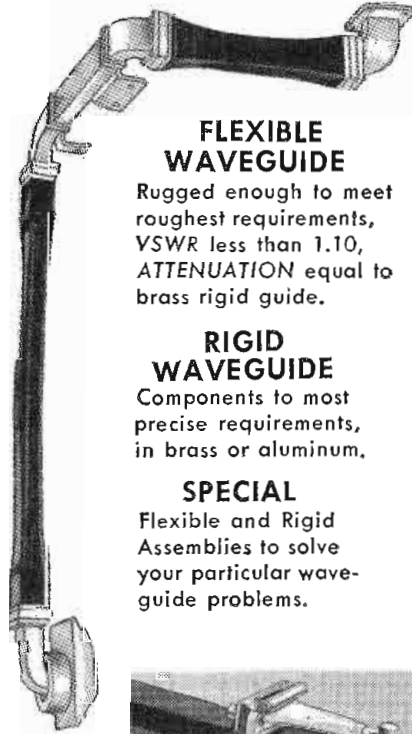


No top-brass television engineer is more prominently active in the new art of chroma and luminance, than Mrs. Martha Kinzie, efficient smiling secretary of NTSC,—in addition to being headquarters mainstay for Dr. W. R. G. Baker at GE's Electronics Park, Syracuse, N. Y. As NTSC factotum, Mrs. Kinzie supervises the issue of reams of committee reports, compiles vast files of technical data, and keeps the complicated machine of interlocking committees rolling smoothly at top speed



**RIGID**  
and  
**FLEXIBLE**

# WAVEGUIDE COMPONENTS



### FLEXIBLE WAVEGUIDE

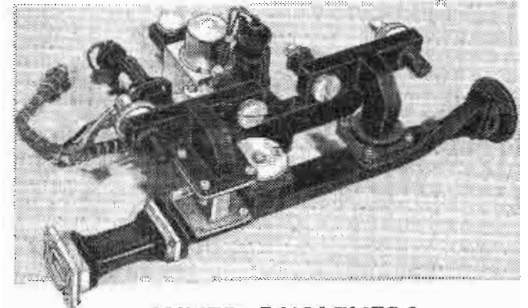
Rugged enough to meet roughest requirements, VSWR less than 1.10, ATTENUATION equal to brass rigid guide.

### RIGID WAVEGUIDE

Components to most precise requirements, in brass or aluminum.

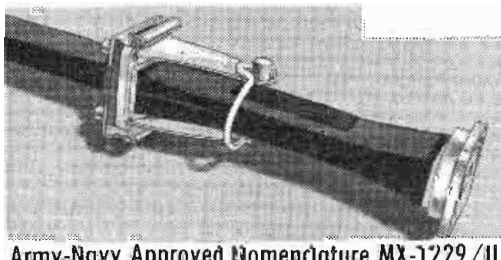
### SPECIAL

Flexible and Rigid Assemblies to solve your particular waveguide problems.

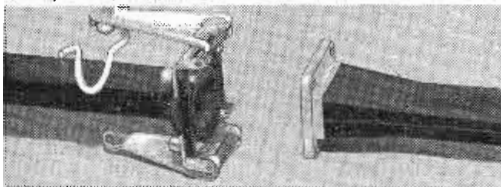


### MIXER DUPLEXERS

Built with precision to closest tolerances, and completely tested. Designed to meet your basic requirements and dimensions, or produced from your blueprints.

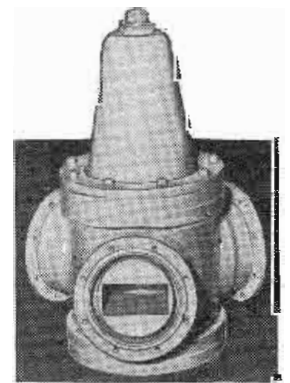


Army-Navy Approved Nomenclature MX-1229/U



### WAVEGUIDE QUICK DISCONNECT

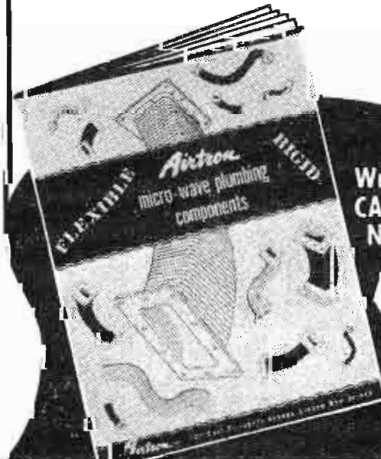
Effective for waveguide junctions of the 1x1/2 size. Mounts on choke as shown above. Mating part connected or disconnected EASILY and FAST. The clamp is suitable for a pressurized joint up to 30 lbs. at -55° C. under military service.



### WAVEGUIDE SWITCHES

A complete line; compact, rugged and suitable for military usage. VSWR less than 1.10 broadband. Crosstalk greater than 50 Db. Speed 1/2 second or less. Operation 24 volt DC, 110 Volt AC. May be specially designed to meet switching problems.

Inquiries are invited.



Write for CATALOG No. 18

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INC.

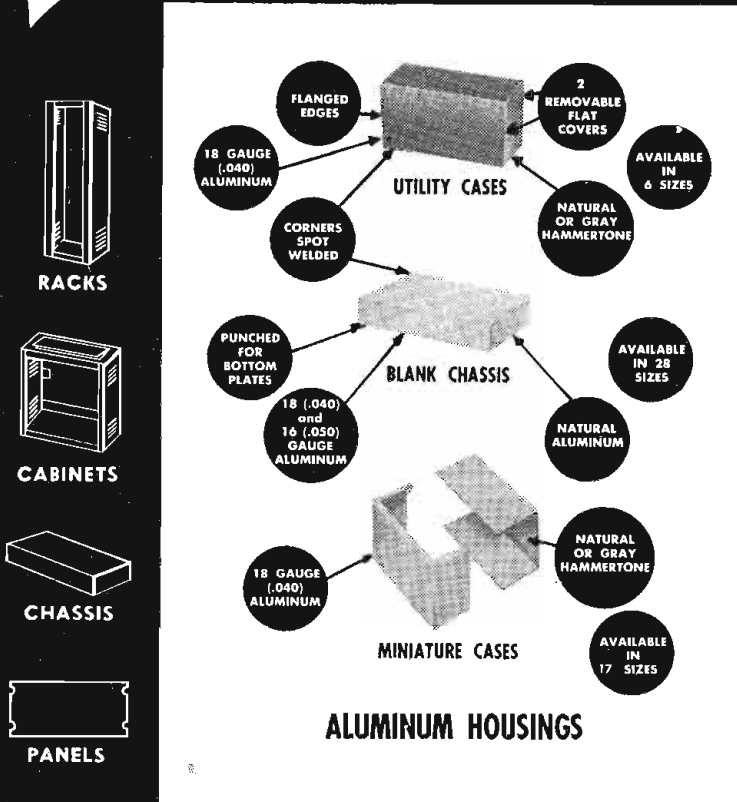
20 East Elizabeth Ave., Linden, New Jersey

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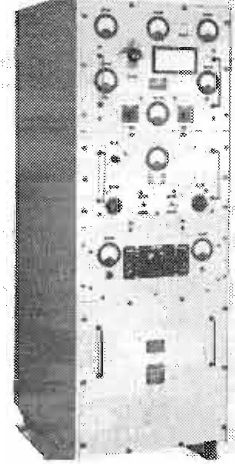


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AND  
SEND FOR  
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CATALOG

### Homing Beacon Transmitter

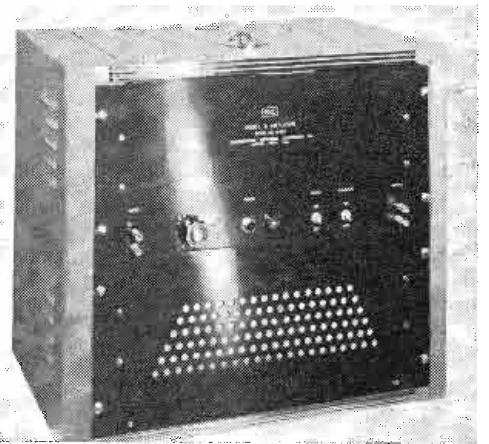
A new hf homing beacon transmitter incorporates a front panel controlled auto-transformer which adjusts carrier power from 25 to 400 watts. Available with or without remote control, the new transmitter employs high level modulation and has a peak-limiter to prevent over modulation. A type 36 automatic code keyer operates from a phase-shift oscillator at 1020 cps. The equipment is supplied with a 51.5 ohm output or an L or T type antenna coupler. It is cooled by pressurized forced air. Fully JAN approved, it withstands Class



B shock tests, and operates in ambient temperatures between  $-54^{\circ}\text{C}$  and  $+65^{\circ}\text{C}$ . Carrier range is 200-300 KC, frequency stability 0.005%, audio response  $\pm 2$  db, 400-3000 cps. Distortion is 6% or less, 400-3000 cps, noise 40 db, below 100% modulation at 400 watts. Power consumption is 2200 watts, 115v ac, single phase, at full power output.—Gates Radio Co., Quincy, Ill.—TELE-TECH & ELECTRONIC INDUSTRIES

### DC Power Amplifier

A new direct-coupled power amplifier has essentially flat response from 0-20,000 cps and will deliver 6.25 watts into 100 ohm load when driven by a 10 v. signal. Distortion is held at low levels. The Model B can be used to amplify the output of oscillators and signal generators to drive Helmholtz coils, various transducers, servo systems, strain gages, differential transformers, simulators

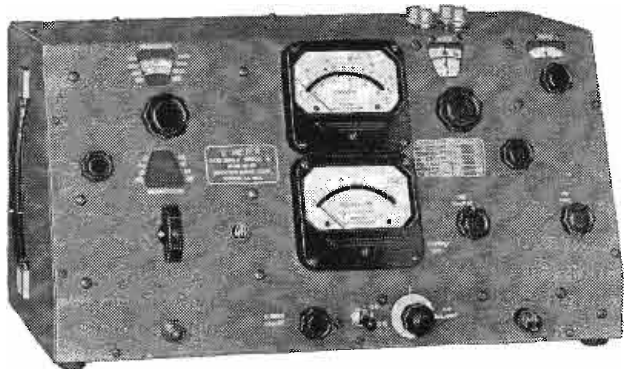


and other power consuming devices. It is particularly useful in dealing with transient phenomena. The new unit operates on 115 v., 60 cps ac at 450 w.—Southwestern Industrial Electronics Co., 2831 Post Oak Rd., Box 13058, Houston 19, Texas.—TELE-TECH & ELECTRONIC INDUSTRIES

### Portable Frequency Converter

Operated from a 60 cycle line, the Model 400 delivers 100 va which makes it especially suited for laboratory development of low power aircraft equipment. A front panel control enables variable output voltage regulation from 105 v. to 130 v. within  $\pm 1\%$ . Frequency is adjustable from 380 to 420 CPS within  $\pm 1$  CPS drift. Total harmonic distortion is less than 3%. These characteristics are independent of the power factor. Comprising a standard audio amplifier, and adjustable tuned circuit, the unit represents a departure from converters and high-power oscillators, and can be placed on the bench adjacent to the load.—Avion Instrument Corp., Division of American Car and Foundry, 291-30 State Highway #17, Paramus, N. J.—TELE-TECH & ELECTRONIC INDUSTRIES

## COMBINES 18 YEARS OF IMPROVEMENTS



NEW  
**Q METER**  
TYPE 260-A  
Freq. 50 kc to 50 mc

#### NEW FEATURES

- Lo Q Scale permits Q readings down to a value of 10.
- $\Delta$  Q Scale reads the difference in Q of two circuits or components up to a value of 125.
- Thermocouple for indicating current inserted into measuring circuit redesigned for high burnout point well above operating current.
- All indications on large meters with parallax correction and accuracy of  $\pm 1\%$  full scale.
- Voltage insertion resistor decreased to 0.02 ohms to minimize effect on measuring circuit. New type low reactance metalized coaxial resistor used.

The Q Meter Type 260-A replaces our Type 160-A, which has been standard equipment for eighteen years. Many improvements have been made, but several of our ideas were too extensive to put into a model in production. The Q Meter Type 260-A includes all past improvements and the extensive changes that we have accumulated.

#### SPECIFICATIONS:

**FREQUENCY COVERAGE:** 50 KC to 50 MC. Continuously variable in eight ranges.  
**FREQUENCY ACCURACY:** Approximately  $\pm 1\%$ .  
**RANGE OF Q MEASUREMENT:** 10 to 625.  
**RANGE OF DIFFERENCE Q MEASUREMENTS:** 0 to 125.  
**INTERNAL RESONATING CAPACITANCE RANGE:** Main tuning Dial: 30 to 450 mmf (direct reading) calibrated in 1.0 mmf increments from 30 to 100 mmf; 5.0 mmf increments from 100 to 450 mmf.  
**ACCURACY OF RESONATING CAPACITOR:** Main tuning Dial: Approximately  $\pm 1\%$  or 1.0 mmf., whichever is the greater.  
**POWER SUPPLY:** 90-130 volts—60 cps (internally regulated).  
 Price: \$725.00 F.O.B. Factory



**BOONTON RADIO**

BOONTON N.J. U.S.A.

*Corporation*

## Colloidal Graphite Used In "Atomic Battery"

An "atomic battery" possessing far-reaching potentialities, is already perfected to a point where it delivers a small current almost indefinitely. "Aquadag," a dispersion of colloidal graphite in water, made by Acheson Colloids Co., Port Huron, Michigan, is used to form an anodic coating on the positive electrode in the battery cell. Primarily a metrological tool at this stage of its development, the "atomic battery" plays an important part in the manufacture of new instruments for precise measurement of radioactivity. It can also be used to measure liquid levels, liquid interfaces, specific gravity, temperature, and pressure.



Mr. Philip E. Ohmart, inventor of the atomic battery, with a cell used for the detection of beta particles. "Aquadag" is used as an electrode

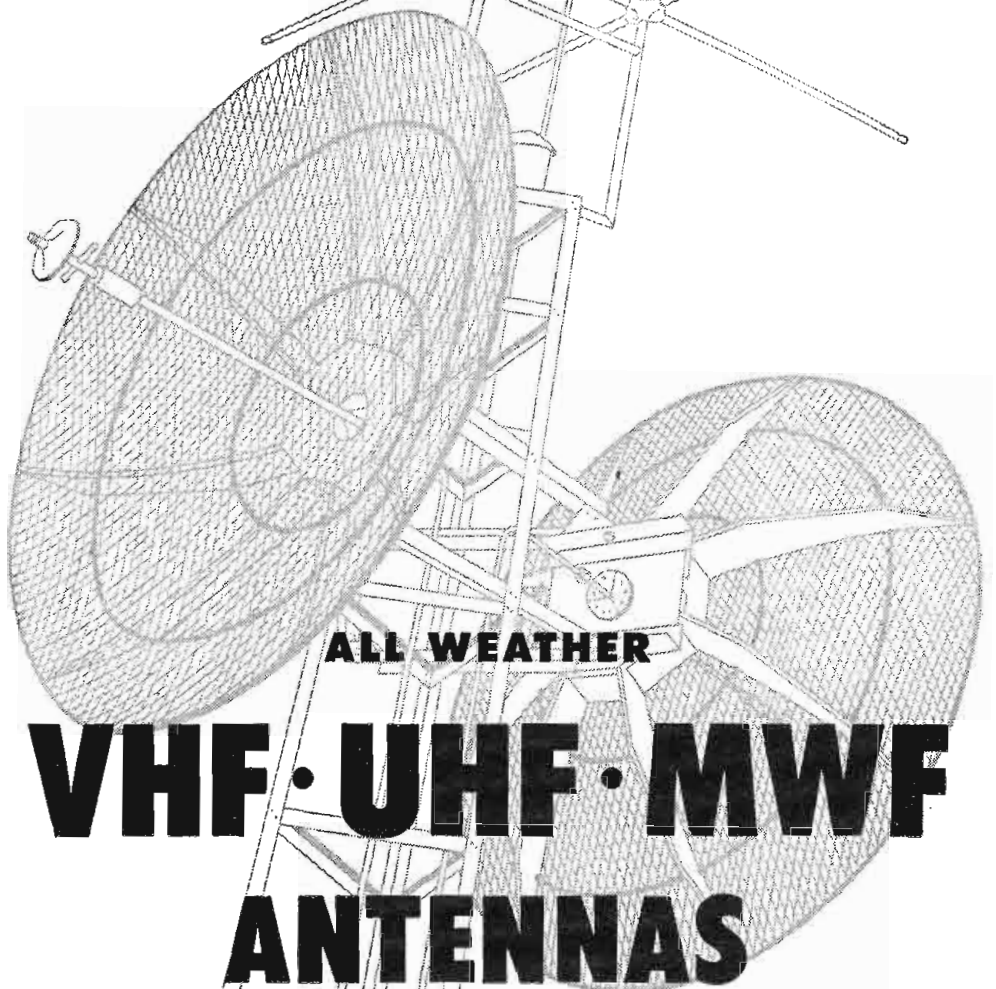
Philip E. Ohmart, president and director of research of the Ohmart Corp., Cincinnati, Ohio, is the inventor of this battery. His theory, which makes use of a gas as an electrolyte after ionizing it by exposure to nuclear radiation, was developed during his work as leader of a research group at the Mound Lab. at Miamisburg, Ohio. It had been found that a cell with electrodes of lead and gold—far apart on the electromotive series—delivered a small current when the air surrounding them was exposed to radiation from as little as 25 millicuries of radium. When the pole connections were reversed, the current likewise reversed its direction. This showed that the electrical current being generated in the cell, with a gaseous electrolyte, was a result of radioactivity. To check this theory, an air-tight cell was built. As this cell was evacuated, the current dropped steadily. Upon further evacuation, the current fell to zero. (And when a high degree of vacuum was established, a negative current resulted!)

After the initial work with lead and gold as electrodes, "Aquadag" was found to be more suitable as the positive electrode because graphite is beyond gold on the electromotive series. Other forms of carbon were tested but the highest positive potential for this

(Continued on page 354)

# Prodelin

Physically Dependable—Electrically Absolute



## TO 2200 MCS

PRODELIN Microwave Antennas are manufactured to meet maximum requirements for physical and electrical service. They operate continuously over difficult terrain regardless of weather or temperature exposure. They are consistently reliable in the most critical services. There is a type for most military and commercial needs at frequencies up to 2200 megacycles.

### JOB-PACKAGED FACILITIES

PRODELIN Job-Packaging means time saved, money saved, on installation services. Complete systems, equipment and tools are ready for your location when and where you need them. Experienced field engineers plan your complete transmission system installation. Write for literature and details.

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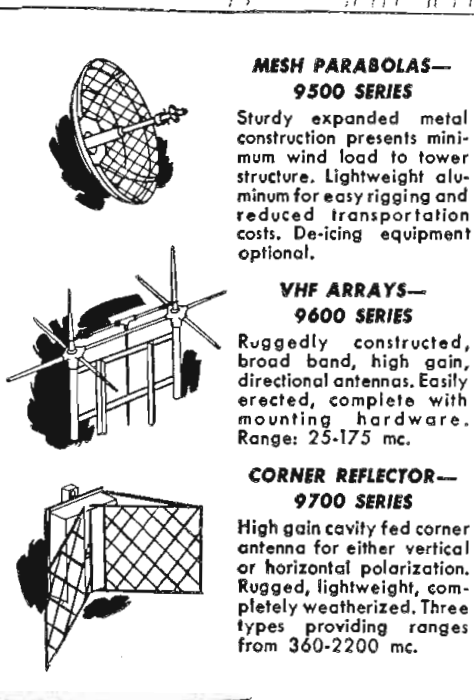
Sturdy expanded metal construction presents minimum wind load to tower structure. Lightweight aluminum for easy rigging and reduced transportation costs. De-icing equipment optional.

#### VHF ARRAYS— 9600 SERIES

Ruggedly constructed, broad band, high gain, directional antennas. Easily erected, complete with mounting hardware. Range: 25-175 mc.

#### CORNER REFLECTOR— 9700 SERIES

High gain cavity fed corner antenna for either vertical or horizontal polarization. Rugged, lightweight, completely weatherized. Three types providing ranges from 360-2200 mc.



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The World's Finest Transmission Lines

Prodelin Inc

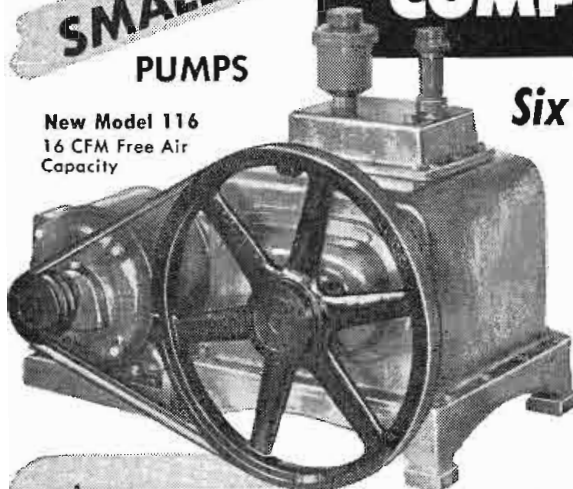
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Kearny, New Jersey

Sales and Service Organization for PRODUCT DEVELOPMENT COMPANY, INC.

Manufacturers of Antennas, Transmission Lines and Associated System Facilities

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**SMALLER**  
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# INTERNATIONAL HIGH VACUUM COMPOUND PUMPS



New Model 116  
 16 CFM Free Air  
 Capacity

## Six Ways a Better Pump:

1. SIMPLIFIED CONSTRUCTION
2. ROTARY VANE
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Speed production and reduce maintenance with these ready-to-operate, high efficiency vacuum pumps!

International rotary vane pumps are extremely compact and operate unusually quiet. Simplified construction and automatic lubrication assure trouble-free operation, long life and low-cost upkeep. Pump mechanisms are totally oil submerged, preventing atmosphere to vacuum leakage.

CAPACITIES UP TO 30 C.F.M.  
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 GLASS-WORKING MACHINERY AND HIGH VACUUM PUMPS FOR  
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type of electrode is produced by the colloidal graphite.

An "atomic battery" has been built which will deliver enough current to run a very small electric motor. But Mr. Ohmart does not claim his invention to be a feasible source of power for mankind. The Ohmart cell, like other atomic battery types, does make possible a battery for use where only a trace of current is needed.

## TV CAMERAS READIED

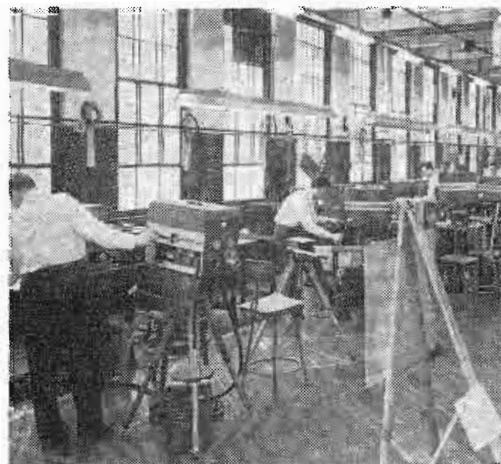


Image orthicon TV camera chains receive final tests at Clifton, N. J., plant of Allen B. DuMont Labs., before being shipped to broadcasters. Unit shown is Type TA-124E camera

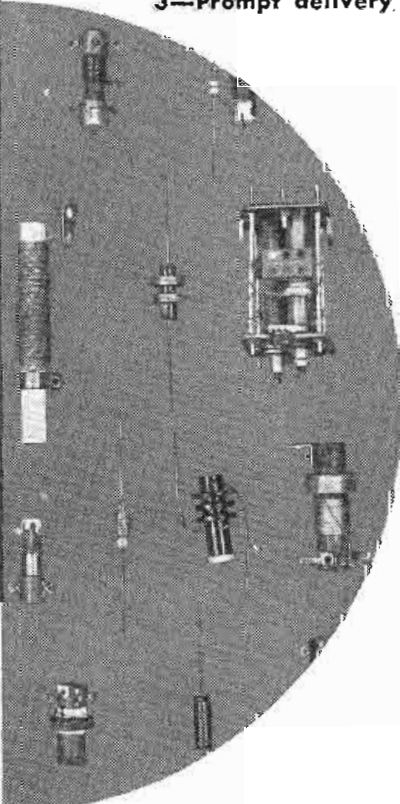
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# 3

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PRECISION MACHINING  
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### PLASTIC FABRICATING

Printloid is equipped for the complete production of a wide variety of consumer and industrial items in any quantity. We do work with any plastic material in sheets, rods and tubes. Die-cutting, deep drawing, stamping, forming, finishing, and assembling.

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Ask for brochure illustrating various plastic products fabricated to specification by Printloid.

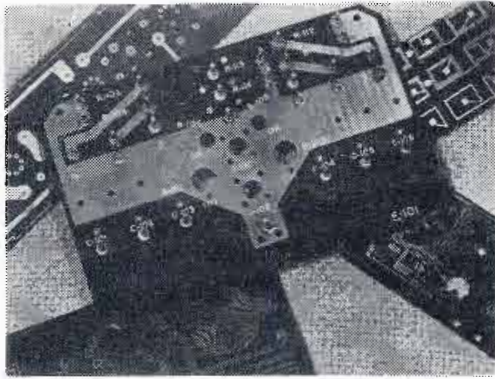
## PRINTLOID, INC.

95 Mercer St., N. Y. 12, N. Y.



**Foil-Clad Laminates  
For Printed Circuits**

Substantial cost savings over hand wiring methods for electronic equipment are made possible through a number of foil-clad laminated plastics manufactured by Synthane Corp., Oaks, Pa. Possessing an excellent bond strength of from 4 to 6 lbs., copper- or aluminum-clad Synthane is now available in 36x36 in. sheets with foil thicknesses ranging from 0.00068-in. to



Copper-clad laminates for printed circuits offer savings through reduced inspection time

0.0094. Foils may be bonded to one or both sides. Accurate circuit reproduction laminates may be achieved by any commercial printing process such as silk screening or photo etching. The foil-clad laminates meet the rigid requirements of the hot solder test which requires a 1x1 in. specimen to be floated foil side down in molten solder at 400-450°F. for ten seconds. At the end of this period no blistering has occurred between the laminate and foil.

The principal laminate used is Synthane Grade XXXP. This paper-base grade combines excellent electrical properties with good machinability. Unclad grade is used when patterns are to be reproduced by printing, plating or stamping.

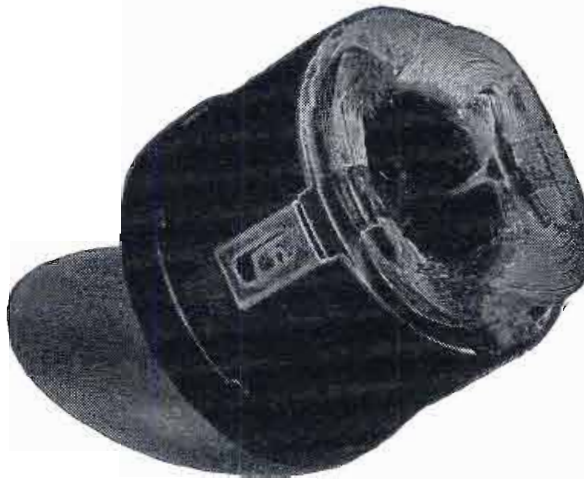
**Zirconium Production  
Process Developed**

A method for the production of zirconium, which was developed under a research project sponsored by the Atomic Energy Commission, has been disclosed by James H. Moore, Director of the Metallurgical Department of National Research Corp. The information was only recently released for security restrictions by the Atomic Energy Commission. Since this is one of the few continuous methods for zirconium reduction which has been publicly announced in recent years, it has aroused considerable interest. While the process described may be commercially interesting for production of special grades of titanium and zirconium, it should not be considered a satisfactory answer to the major problem of finding a cheap method for tonnage production of these metals. National Research Corp., in partnership with Monsanto Chemical Co., is engaged in an intensive study of this latter problem.

meeting

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Needs with DEFLECTION YOKES**

and  
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COMPONENTS**



PRIME and SUB-CONTRACTORS are invited . . . to send specifications for quotation, or for information on our facilities.

Our new, enlarged plant enables us to add customers who need deflection yokes or other electronic components for military and manufacturing operations.

We invite your inquiries.

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**BUILD YOUR OWN  
Heathkit  
TEST EQUIPMENT**

Heathkits are completely engineered instruments supplied unassembled. Every kit goes together smoothly and easily. All drilling, punching, and painting has already been done for you. All parts are furnished and are of highest quality.

Detailed construction manual shows clearly where each wire and part goes and tells exactly how to build the kit. Write for free catalog.

**AUDIO GEN. KIT**  
\$29.50

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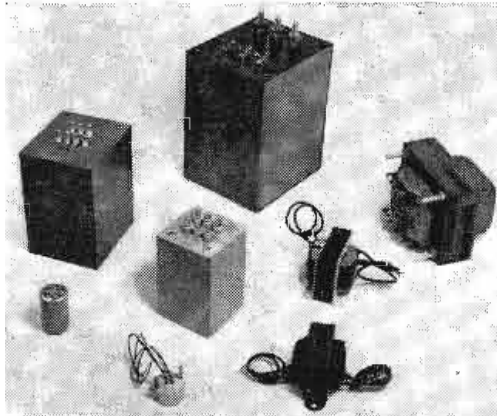


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- A Reliable Source Since 1941.
- Both Military and Commercial Units.
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SPECIFICATIONS

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Upper Darby 2, Pa.

GRanite 4-8000

## News of MANUFACTURERS' REPS

Allen B. DuMont Laboratories have appointed Stephen W. Pozgay sales representative for their TV broadcasting equipment in Kentucky, Virginia, and parts of Indiana and Ohio.

Merit Coil & Transformer Corp., Chicago, Ill., announce that Victor W.



Victor W. Williams

Williams of Margate, N. J., is currently representing them in Maryland, Virginia, and District of Columbia.

C. B. Parsons & Co., factory agents, Seattle, Wash., has moved to larger quarters at 3028 First Ave. C. B. Parsons is secy-treas of the Pacific Northwest Chapter of "The Representatives".

Kenyon Transformer Co., Inc., 840 Barry St., New York has appointed J. J. "Buck" Joyner, Jr., P. O. Box 341, Sta. A, Atlanta, Ga., to cover Alabama, North and South Carolina, Tennessee, and Mississippi. T. Louis Snitzer, 5777 West Pico Blvd., Los Angeles will cover California.

National Union Radio Corp., Hatboro, Pa., has made Sam L. Spraggins, formerly with Hoffman Radio Corp., sales representative for the West Coast area on industrial and initial equipment accounts. His office will be at 373 S. Robertson Blvd., Beverly Hills, Calif.

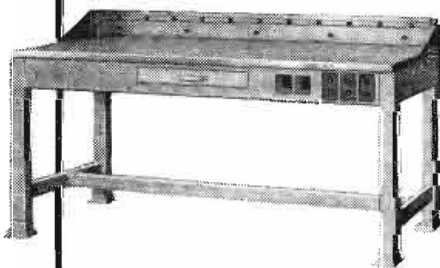
General Ceramics and Steatite Corp. has appointed sales representatives for Western New York and New England. New England states will be represented by R. S. Pettigrew Co., 62 LaSalle Rd., West Hartford, Conn. Western New York will be handled by Martin P. Andrews & Co., Mott Rd., Fayetteville, N. Y.

\* \* \*

For a nation-wide list of representatives operating as independent "reps" who handle two or more lines, turn to the index which begins on page 308 of this issue.

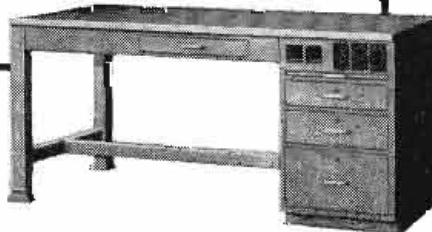
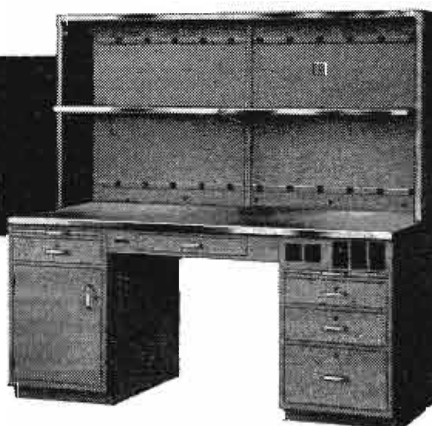
## Electronic TEST UNITS

Formica Company offers the industry the latest development in electronic laboratory furniture and equipment — test benches and units made up of prefabricated sections, factory assembled from stock to suit the special requirements for your individual application.



These testing units offer unusual space-saving arrangements. Through their design, available working area has been increased at least 50% over that in other types now in use. For more information write for brochures and specifications.

Designed by engineers for engineers, with serviceability in mind — the individual sections are constructed to afford the greatest number of varied selections and combinations. Made of heavy-gauge furniture steel, Formica's benches are sturdy and can take a beating, yet are modern in style and practicability, to meet today's laboratory needs.



## FORMICA COMPANY

ELECTRONIC LABORATORY FURNITURE  
110 K STREET, SOUTH BOSTON 27, MASS., SO 8-1611

**Low Cost  
"Package" TV**

The General Electric Co. has announced a low-cost "package" TV station, designed to hasten the advent of TV in the 1100 small cities (under 50,000) allotted channels by the Federal Communications Commission. The new "package" station requires but a single technical operator to prepare and broadcast film and network programs. Its equipment will cost about one-fourth as much as today's average station, which employs upwards of three tech-



Control desk for "package" TV station allows one operator to handle film and net programs

nicians. The "package" station will be available for either VHF or UHF telecasting, and in several different power ratings.

Heart of the one-man operation is a new switching system, which permits a single operator to control from a central point the transmitter, slide and film projectors, audio and transcription facilities, and network programs. All the equipment would be located in the station's transmitter building. The operator sets up the day's slide and film presentations in advance, and then may control their operation from the single control point. He also controls the presentation of network programs from the same control point. Control units in the "package" are so designed that additional equipment for expanded programming operations may easily be added, without special adaptation.

**New RTMA Standards**

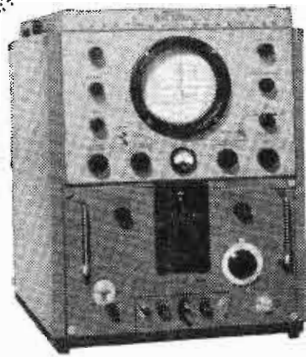
Three new RTMA recommended Standards have been released. They are:

ET-103-C—Electron Tube Bases, Caps, and Terminals. (This Joint RTMA-NEMA Standard supersedes ET-103-B dated April 1952 and takes cognizance of the material in Standards Proposals Nos. 364, 368, and 375).

REC-113-A—Vibrating Interrupters and Rectifiers for Auto Radio (supersedes REC-113 dated April 1948 and includes additional material from Standards Proposal No. 374).

TR-104-B—Electrical Performance Standards for Monochrome TV (Channels 1-13) Broadcast Transmitters (supersedes TR-104-A dated Oct. 1949 and includes material from Standards Proposal No. 349).

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SPECTRUM  
ANALYZER**



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To determine basic frequencies of the carrier and side bands and evaluate their relative intensities.

To disclose instability, erratic output, or undesired components being generated.

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R. F. Heads are interchangeable, offering a wide choice of operating frequencies with a single, compact unit. Separate heads supplied in convenient, protective storage cases. S-band and X-band heads from stock; others available for early delivery.



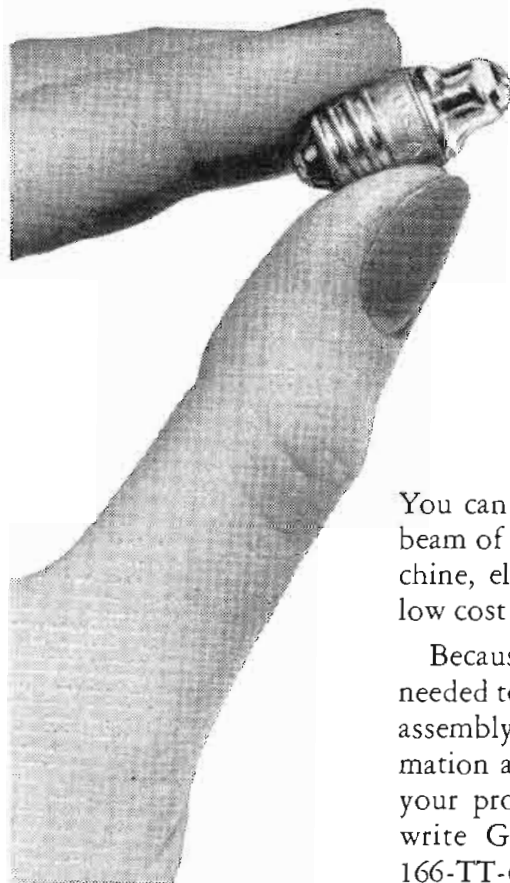
Vectron's development program includes additional R. F. Heads to cover microwave frequencies newly opened for military and civilian use. For information on these additional R. F. Heads and for complete engineering and operating data, send for Bulletin SA20. Write today and be sure to specify the operating frequencies you need.

Vectron invites your inquiries regarding the development and manufacture of:

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- Test Instruments

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You can add the extra safety and convenience of a beam of light to any home appliance, business machine, electrical or electronic device easily and at low cost with a General Electric lens-end bulb.

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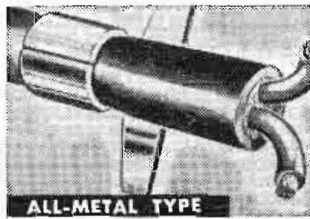
Gripmaster Strain Reliefs are "tremendous trifles" that make good products better!

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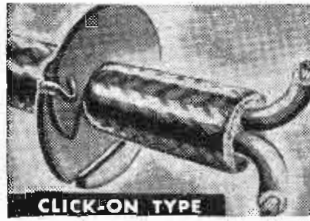
## 4 WAYS TO END ALL CORD AND CABLE SERVICE FAILURES

*Economically*

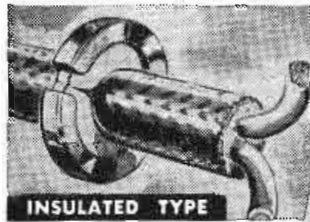
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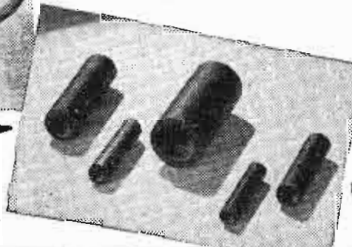


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## House Committee Sees Lawrence Tube

Members of the House Committee on Interstate and Foreign Commerce, key members of the FCC staff and the press recently attended two demonstrations of the Lawrence color TV tube operating on the CBS as well as the NTSC standards.

The tube was invented by Nobel Prize winner, Ernest O. Lawrence, and is being developed by Chromatic Television Labs., Inc. Dr. Lawrence and his associate, Dr. Luis Alvarez, participated in both demonstrations. Richard Hodgson, President of Chromatic Television Labs., Inc. explained that "As far as the tube is concerned, whether the standards adopted are compatible or incompatible is immaterial." Mr. Hodgson called attention to the unique features of the Lawrence tube, stating that these were: (1) the large size of the picture, (2) its high brightness, (3) the superior quality of its black and white picture, (4) the high fidelity and definition of the color reproduction, and (5) the simplicity and consequent lower cost of the tube design. At the demonstration of the 22-in. color tube, he said that Chromatic is now tooling up for a 28-in. rectangular tube and that their tricolor tubes should sell for \$25 to \$35 more than black-and-whites of equal size. For more details, see the Feb. 1953 issue of *TELE-TECH & ELECTRONIC INDUSTRIES*, page 71.

## ELECTRONIC ENGINEERS

EE or ME degree, minimum 3 years' experience in research and development work involving circuitry, servo-mechanisms, analogue computers, radar, and related equipment.

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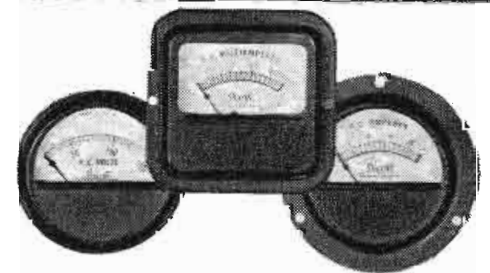
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**TYPES**—ammeters, milliammeters, voltmeters, AC and DC. Resistance meters.

**ACCURACY**—well within 5%. AC meters are double-vane, repulsion type with jeweled bearing; DC meters are polarized-vane solenoid type.

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### SHURITE METERS

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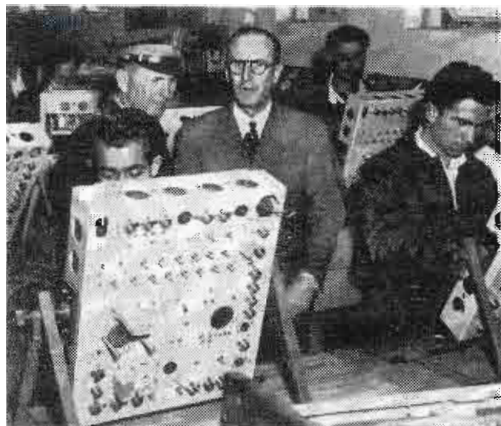
## New Air Force Radar Trainer

A revolutionary new device for bombardment and navigation training without actual flight has been announced by the U. S. Air Force's Air Research and Development Command. This ultrasonic radar trainer, identified as the AN/APQ-T1, was designed and built by American Machine and Foundry Company's Electronics Div., Boston, under the supervision of the Air Research and Development Command's Wright Air Development Center, Dayton, Ohio.

Employing computers and the same instruments as found in aircraft, the trainer will present to air crew personnel the identical situations and problems that would be met in actual flight. It introduces friendly beacon signals and simulates enemy radar jamming signals to authenticate the problem. The fact that there is a ratio of 200,000 to 1 between the speed of electromagnetic waves in air and the speed of ultrasonic waves in water is the basic principle that makes possible the operation of the trainer. As a result of this ratio, it is possible to simulate radar flight by moving an ultrasonic transmitting and receiving apparatus over a reduced scale terrain contour map of a portion of the earth's surface. The map, which is only 1/200,000th the size of the area it represents, is submerged in a tank of purified water held at a constant temperature in order to keep the scale factor constant.

Above the map, but also submerged in the water, is a simulated radar antenna, the position of which can be controlled and maneuvered by the instructor-director, at a control console, acting as the aircraft's pilot. Instead of sending out radar pulses, however, it transmits pulses at ultrasonic frequencies. Consequently the scale of the map can be so greatly reduced that an area representing about 360,000 sq. mi. can be represented in a portion of the self-containing trainer building 3500 sq. ft. in area.

### ITALIAN-MADE U. S. RADAR



Dr. Carlo Calosi, center, head of the Micro-lambda plant in Fusaro, Italy, explains to Gen. J. Christiansen certain phases of assembling Raytheon radar equipment, made under the Waltham, Mass. firm's licensing agreements and know-how, and scheduled for use in Western Europe's growing ring of defense. The equipment gives early warning of the approach of enemy aircraft. U. S. Navy official photo.

  
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## high-precision thermistors by **BENDIX-FRIEZ**

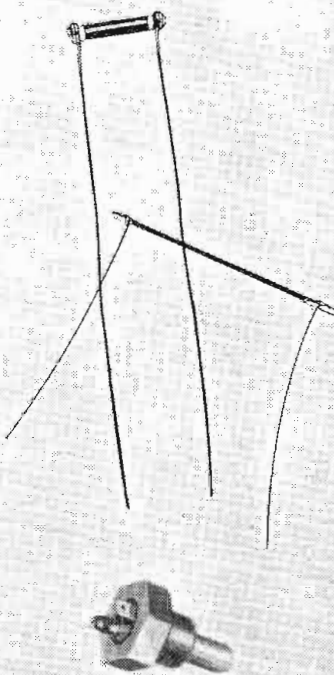
As temperature measuring elements and liquid level sensors, these temperature responsive resistors are the best you can buy. In standard or special types, their high-precision manufacture makes them precisely right for your job when it comes to resistance values, size, temperature coefficient, mountings and quality. Ask us about applications.

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Used in this typical application for sensing the temperature of hydraulic oil.



*"The Panel with the Light Inside"*



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Laminated panels, knobs, switches, flat dials and even drum dials have the required letters or figures processed into the background so they appear dead white against the non-reflecting black background. In the dark, small, red-filtered lamps which are inserted in the inside lamination of clear plastic, illuminate the figures with a red light which the eye does not retain when in motion.

All dials and panels are laminated of methyl methacrylate and vinyl films which meet the standards of Specification MIL-P-7788. They will withstand all standard humidity and salt-spray testing; and no change is noted in the overall efficiency of the materials when tested at temperatures varying between  $-65^{\circ}\text{C}$  and  $+85^{\circ}\text{C}$ .

This new method of making control panels, dials, knobs, etc., lends itself readily to quantity production and competitive costs. For application other than military use, other colors have also been developed.

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## Printed Circuit Components

More compact and efficient radios, TV receivers, and communications equipment were envisioned with the announcement of printed-circuit inductors mass-produced for general use. In such components, printed circuitry replaces conventional wire windings with uniformly made printed coils, according to



Glass negative for producing printed circuits, before insertion in automatic printing machine

the Tube Department of the RCA Victor Div., Radio Corp. of America. These revolutionary components—six 40-mc i-f transformers, coils, and traps—are produced by a special photo-etching process from a single photographic negative, according to L. S. Thees, general sales manager of the RCA Tube Dept. The new components are housed within tiny metal shield cans measuring only

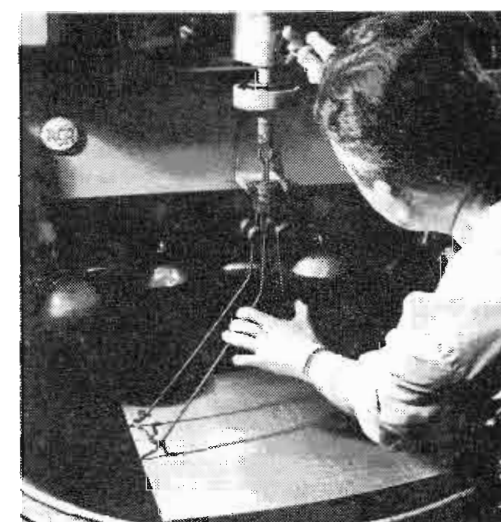


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Copper-clad plastic sheets are inspected before being whirled in heat tank to dry emulsion

$\frac{7}{8}$  x  $2\frac{1}{4}$  in. Alignment adjustments are furnished by special screw discs accessible from one side of each component. The production of a printed-circuit component begins with a photograph of the pattern of the required circuit. A contact print of the negative is then made on a copper-clad plastic strip which has been coated with a light-sensitive material. Following this operation, the strip is developed and placed in an etching solution. The unexposed parts of the copper are eaten away, leaving an accurate, sharply defined reproduction of the desired copper circuit. After the strip has undergone additional processing, it is inserted in a metal case.

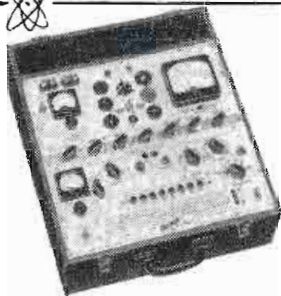
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## TUBE TESTER

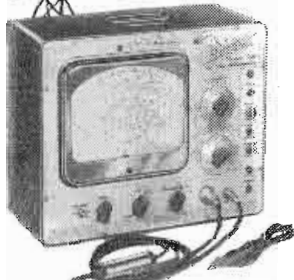
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Model 539A



### Capacitance METER and TRUE VTVM



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An accurate multi-purpose instrument for laboratory and industrial use. Measures wide ranges of inductance, capacitance, resistance, current and voltages, both AC and DC. Built with 9 inch Zero-Center scale. Matched high frequency probe is included to make this instrument a True VTVM. Peak-to-peak or RMS. Useful to 300 MC. DC probe is available to extend range to 30,000 volts.

Model 209A



### Microvolt SIGNAL GENERATOR

125 KC to 120 MC and 150 to 220 MC  
on fundamentals



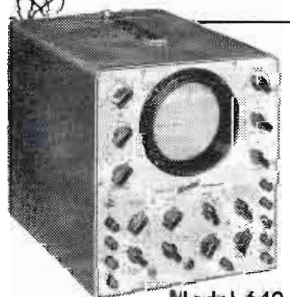
Model 292X

An accurate microvolt signal generator that meets the needs of such high-frequency users as police, fire dept. and military as well as industrial laboratories. Calibrated output from 0.5 to

100,000 microvolts. Also available: 292XAL with continuous coverage. 125KC to 165MC on fundamentals.



### 5" Oscilloscope



Model 640

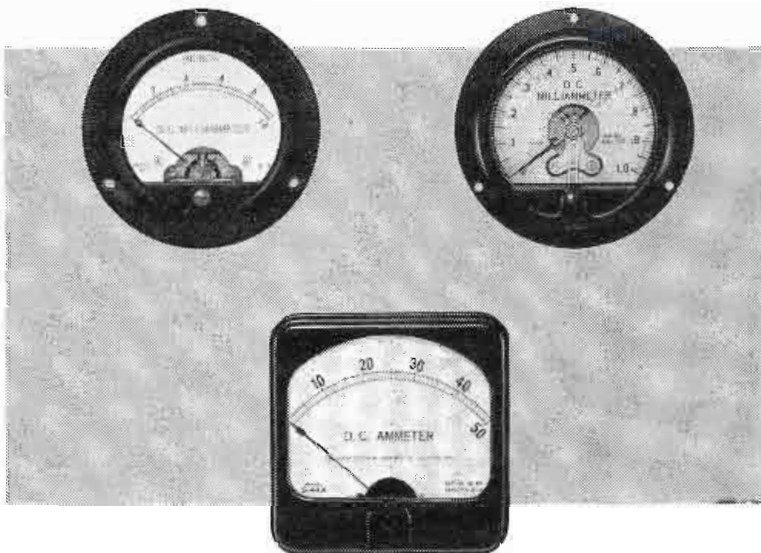
An outstandingly versatile 'scope designed for general purpose industrial laboratory and television applications. Both driven and recurrent sweep. Wide band amplifier: Frequency response DC, 0-4.5 MC, down 3 db. 17 M. V. per inch sensitivity.

Calibrating voltages, triggered sweep, provision for Z-axis modulation, combination light shield, and camera base are provided. Stable, shielded and shock mounted. Three other models are available.

Write for technical details on the complete HICKOK Test Equipment line.

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## INDICATING METERS



For over 43 years HICKOK has pioneered, developed, and improved electrical indicating instruments. Today, HICKOK manufacturers meters of all classes ranging from the most accurate laboratory types with an accuracy of 0.2% of full scale deflection on down to small pocket portable types with an accuracy of 1 1/2%.

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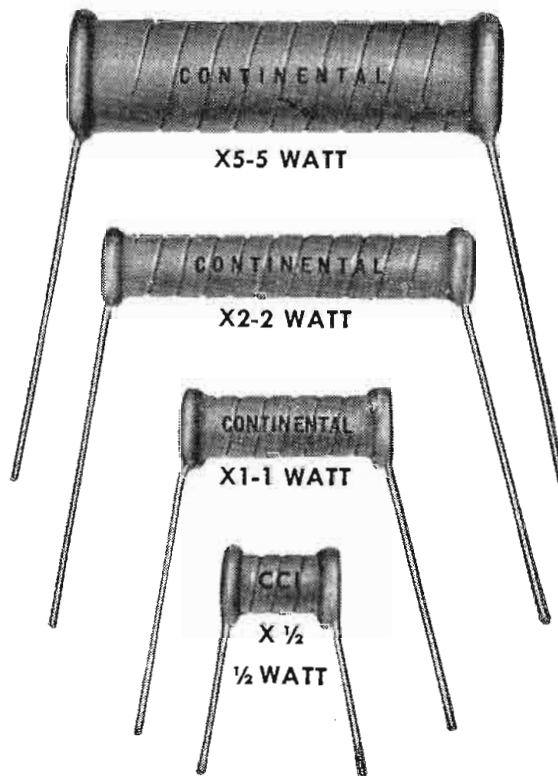
Full technical information on the complete line of HICKOK instruments and test equipment is available on request. Kindly list details of your requirements.

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## Pre-determining System for TV and Movie Quality

Unprecedented mathematical accuracy in predetermining the quality of images any given TV or photographic system will produce has been reported as the result of progress on a unique measuring system which permits the scientific grading of picture-producing instruments. The progress was outlined in a technical paper delivered by Otto H. Schade, RCA Tube Department engineer, before the Convention of the Society of Motion Picture and Television Engineers at Los Angeles.

In an address before the SMPTE 18 months ago, Mr. Schade disclosed his system of universal ratings which can be applied to measure with scientific objectivity the quality of all image-producing instruments—camera and projection lenses, TV camera and picture tubes, and positive and negative motion picture film. Today's paper outlined the use of the system to translate optical properties of images into electrical terms.

The system is based on the establishment of electro-optical equivalents to permit accurate expression of optical characteristics in mathematical language. For example, many significant properties of an image depend upon the characteristics of its "star" image (image of a point source of light). The table of electro-optical equivalents shows the star image of an optical "circuit" to be the counterpart of the impulse response of an electrical circuit. Accordingly, the mathematical relations between electrical impulse responses, frequency characteristics, and edge transitions can be applied to compute counterpart properties of optical star images.

The importance of the electro-optical equivalents to the television and motion picture industry is that they can be applied to accurately grade the quality of the elements of any image-producing system. The gradings, in turn, make it possible to predetermine mathematically the quality of the picture which the system is capable of producing.

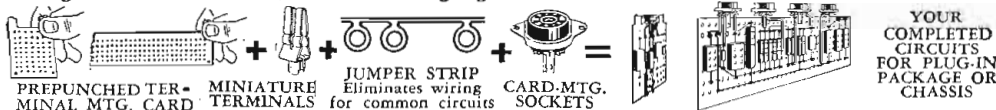
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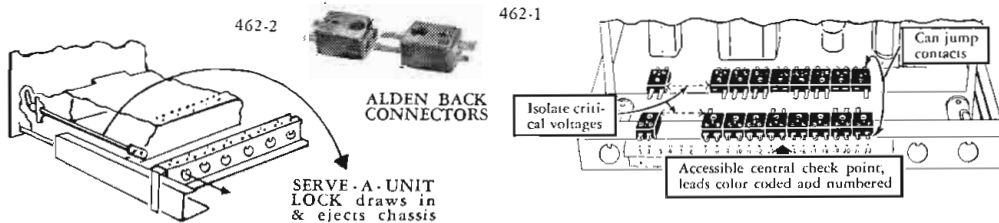
You can use Alden Terminal Mounting Card with Alden Miniature Terminals, Jumper Strip and Sockets staked to accommodate any circuitry—making complete units ready for housing. Components snap into unique Alden Terminals, are held ready for soldering.

### 2. Mount this compact vertical circuitry in neat accessible ALDEN PLUG-IN PACKAGE OR CHASSIS

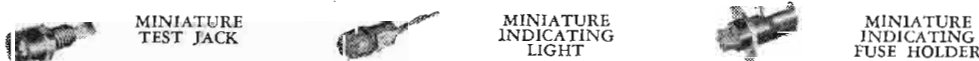


Alden components provide standard plug-in or slide-in housings—with spares, your circuits become units replaceable in 30 seconds.

### 3. Use ALDEN BACK CONNECTORS and SERVE-A-UNIT LOCK for 100% circuit accessibility and 30-second chassis removal.



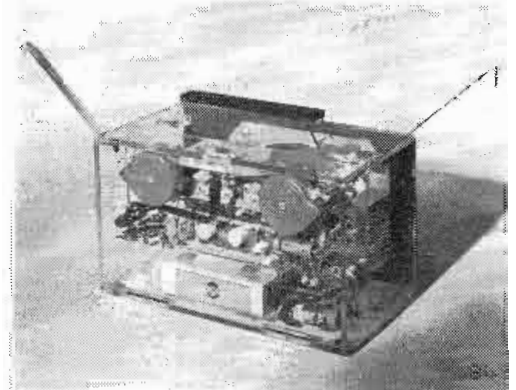
### 4. Assign to each unit tiny tell-tale ALDEN SENSING ELEMENTS — to spot trouble instantly:



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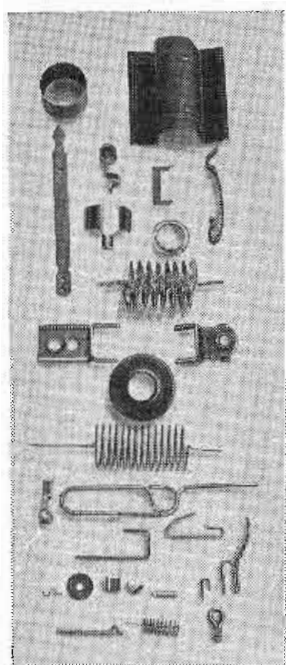


RCA's portable FM receiver, covering 88-108 MC band, weighs only 5 lbs., employs 11 junction and point-contact transistors. Transistor used as an oscillator operates at about 100 MC. Unit shown is developmental, and in present form is not as sensitive as standard tube set.



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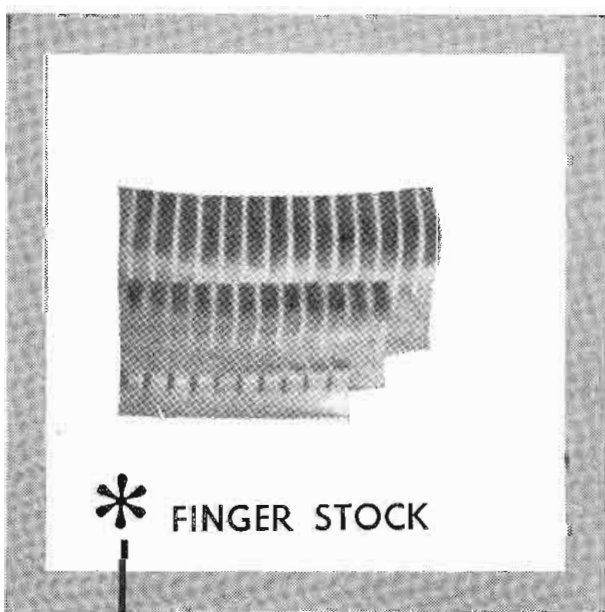
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Silver-plated, spring alloy, pre-formed finger stock especially suited for electrical "weather-stripping" for TVI-proofing cabinet access doors, etc. Also ideal for making coaxially constructed tube connections and many other uses. Available in 17/32", 31/32", and 1 7/8" widths.

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With gold plating methods developed by Technic Inc., you can now achieve accurate control of quality, evenness, thickness, color, and hardness of gold deposits. Through cycle plating that is practically automatic in operation, we have virtually converted the old art of plating gold to an exact science.

\*

Factors in successful application of our methods are the absolute stability of quality of our gold plating solutions and specification of standards for automatic control of replenishing the bath, coupled with an automatic timing device which ensures precision in operation and eliminates human error.

\*

When you refer plating problems to Technic Inc., we solve them by application of a thorough service — consisting of specifications for a complete installation or correction of faults in your present installation, schedules for solutions and timing, assignment of an engineer who stays with the job until your installation is working at full efficiency.

Write for

### "ELECTROPLATED GOLD" Technical Data Sheet

Without obligation, write for our informative new Data Sheet which details fully the advanced Technic Inc. gold plating methods and services for platers outlined above.

For reference, you will also receive a list of leading industrial concerns — many with production problems resembling your own — which rely on Technic Inc. controlled gold plating installations to improve production while reducing cost.

Our Controlled Gold Plating methods result in complete dependability, elimination of waste of precious metal, high increase in production, better appearance of product — together with significant reduction in operating personnel, rejects and all-over costs. Send us your plating problems for review, or call in a Technic engineer for consultation. No obligation is involved.

**TECHNIC INC.**



Jackson 1-4200

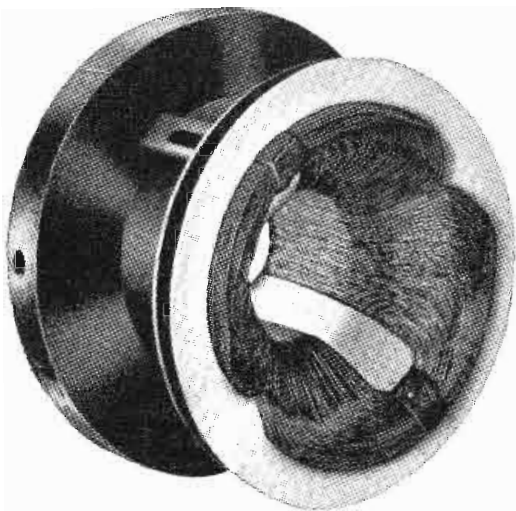
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Announces

# a NEW 90° YOKE for 27" TUBES



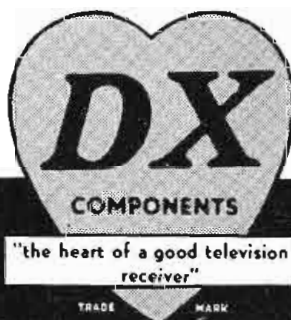
## It's Engineered for TOP PERFORMANCE ... in Production NOW!

This new DX 90° Deflection Yoke has everything a television receiver manufacturer wants . . . a sharp full-screen focus, a minimum of pincushioning, the ultimate in compactness and a price that's downright attractive. Because this yoke has been brilliantly designed for mass production on DX's specialized equipment, it warrants immediate consideration in your 27" receiver plans. Write us today.

DEFLECTION YOKES . . . TOROID COILS . . . CRYSTALS  
I. F. TRANSFORMERS . . . R. F. COILS . . . DISCRIMINATORS  
SPEAKERS . . . TV TUNERS . . . ION TRAPS . . . TRANSFORMERS

### DX RADIO PRODUCTS CO.

GENERAL OFFICES: 2300 W. ARMITAGE AVE., CHICAGO 47, ILL.



TAKE NO CHANCES WITH VITAL EQUIPMENT... *Specify*

SERIES 6918 or 6924

# RACKS by PAR-METAL

18½" or 24" DEEP, for 19" WIDE PANELS

- Panel Spaces: 61¼", 70", or 77" high,
- Finished in Prime Coat, Black Wrinkle, Grey Lacquer, Grey Wrinkle.
- Series 6918 or 6924 Racks may be used in "rows" or "gangs," as corner trims are removable from front of cabinet.
- Standard shelves and roller trucks are manufactured by us for use with these Racks.

THESE RACKS ARE MODERATELY PRICED and AVAILABLE FOR SHIPMENT FROM STOCK

Planning an electronic product? Consult Par-Metal for

## RACKS • CABINETS CHASSIS • PANELS

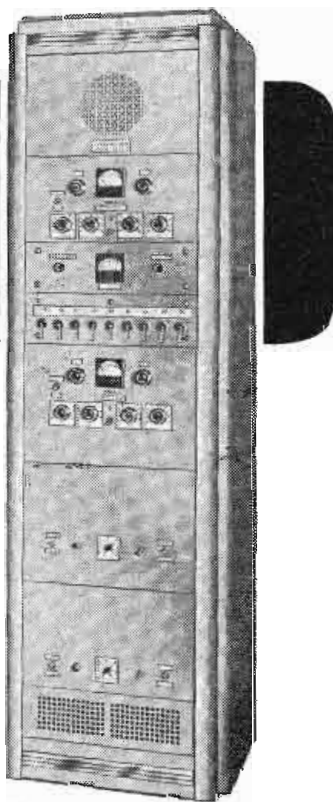
Remember, Par-Metal equipment is made by electronic specialists, not just a sheet metal shop.

Made by Electronic Specialists!



### WRITE FOR CATALOG!

Our P-6924 Rack as used by Gai-Tronics, Inc., Reading, Pa.



# PAR-METAL PRODUCTS CORPORATION

32-62 — 49th ST., LONG ISLAND CITY 3, N. Y.  
Tel.: Astoria 8-8905  
Export Dept.: Rocke International Corp.  
13 East 40 Street, New York 16, N. Y.

## Quality Control

(Continued from page 156)

and Government Source inspected material in the stockroom is desirable also.

The fifth step is to establish control of calibration, test equipment, and gages, with a continuing process of check on a routine basis.

Next is to establish process controls, from first piece inspection, through patrol inspection, down to final acceptance inspection, to insure that the product is being made to the specifications.

Then comes the establishment of a formal Material Review procedure in accordance with Specification MIL-Q-5923A, to handle material which departs from specification requirements. Such a procedure includes the establishment of a Material Review Board, proper paperwork, and proper materials handling and segregation methods.

The eighth and final step is to prepare written procedures and forms to describe in a formal way just what your Quality Control system is and present them to the Air Force Inspector for review. While there is a requirement in MIL-Q-5923A stating that prior approval of a Manual of your Quality Control System is mandatory, the author has learned that there is under consideration a change in this requirement to call for review of the Contractor's procedures in written form, but deleting the need for prior approval of a complete manual. This will probably appear as specification MIL-Q-5923B with the above mentioned change and other minor changes from the earlier version.

## As We Go to Press . . . .

Information has just been received that Air Force Specification MIL-Q-5923-A, covering quality control requirements, has been amended with the issuance of MIL-Q-5923-B. Summarized below are the differences between the two, with brief interpretations of what the changes will mean to the manufacturer.

1. The complete Quality Control Manual covering general procedures will not be necessary, but detailed procedures must be prepared and approved by the local Air Force Quality Control Representative.

2. The application of MIL-Q-5923-B is restricted somewhat, and a plant may be exempted from its requirements, but this needs careful checking. If a plant is exempt is should ask its prime contractors and Government contracting offices to omit reference to the specification in purchase orders.

3. Inspection stamps need not be in accordance with Air Force preferred designs except for special processes.

4. Where a plant is under the inspection cognizance of another service, such

as Signal Corps or Navy, the specification does not normally apply.

5. The specification does not apply in essential respects to research and development contracts.

6. The Contractor Facility Rating system has been terminated, but has been replaced by a new Air Force Inspector rating system, using a long and complex Minimum Guide List. This can cause many problems for the Government Inspector and the Contractor.

7. The requirements of inspection of Purchased Parts, Components and Assemblies have been made more stringent.

8. There is a reduction in, but not elimination of, need for paperwork on such details as records of test equipment.

9. There is a new requirement on preparation of engineering models on production contracts which calls for working through the Government Inspector to the Government Laboratories.

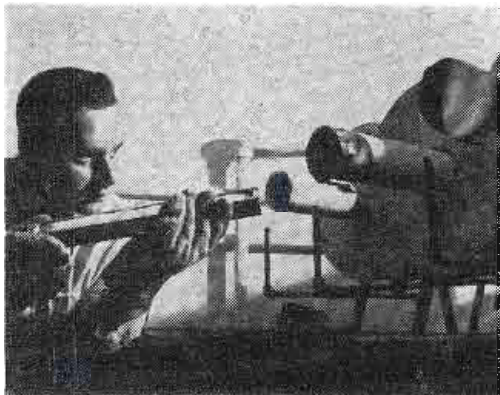
### Everitt Named to Committee Studying NBS

The Institute of Radio Engineers has nominated Dr. William L. Everitt, renowned radio authority and Dean of the College of Engineering, University of Illinois, to serve on a committee of scientists formed at the request of Secretary of Commerce Sinclair Weeks to evaluate the present functions and operations of the National Bureau of Standards in relation to the present national needs. Dr. M. J. Kelly, President of Bell Telephone Laboratories, will serve as chairman of the committee.

Other societies contacted by Mr. Weeks were the American Institute of Electrical Engineers, American Institute of Mechanical Engineers, American Society of Civil Engineers, American Institute of Physics, American Chemical Society, and the American Institute of Mining and Metallurgical Engineers.

Dr. Everitt's nomination was made only after assurance had been received from Secretary Weeks that the committee will operate under the National Academy of Sciences, that it will not be concerned with personnel relationships between the National Bureau of Standards and the Department of Commerce, and that the report of the committee will be made public.

### GERMANIUM PROCESSING



A tray of germanium powder is readied for insertion in a special hydrogen furnace at RCA Victor's Harrison, N. J., plant. Temperatures ranging up to 1,050° C will convert the powder to metal. The metal ingot will then be processed.

# FINNFLEX

## AIRBORNE MOUNTING BASES

Conform to JAN-C-172A SPECIFICATIONS

... but are actually made to exceed AN-E-19 Drop Test requirements

**RUGGED PROTECTION for VITAL EQUIPMENT:** Finnflex Mounts isolate vibration and shock from *Electronic, Communication, and Control Equipment*. They offer unimpaired efficiency from -80° to +250°F., "Selective Action" friction dampening, non-linear steel springs, and other features. Wide range of sizes and load ratings available.

**SHOCK MOUNTS** for Signal Corps Mobile Equipment and for Naval Fire Control Units.

**SPECIAL PROBLEMS:** Complete facilities for designing and fabricating Shock and Vibration Mounts to order — regardless of size or weight of equipment mounted.

*Specify FINNFLEX—for Ruggedness, Efficiency, and Economy.*

Write for Catalog MB-110

### T. R. FINN & COMPANY, Inc.

Specialists in Vibration Control

333 JACKSON AVENUE, NEW YORK 54, N. Y.

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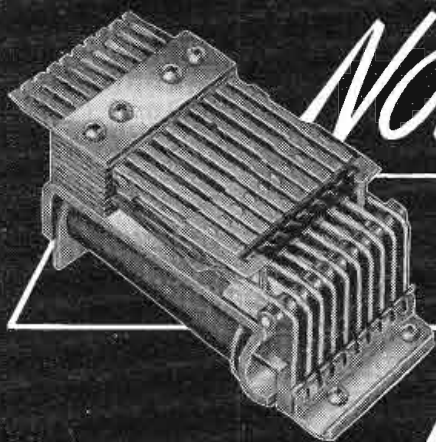
TYPE SR MOUNTING BASE



TYPE TPM VIBRATION ISOLATOR

## VIBRATION ISOLATORS and SHOCK MOUNTS

To JAN-C-172A SPECIFICATIONS and TO ORDER



**NOW...** for the first time **KELLOGG** magnetic impulse counter

- The long life normal to relay equipment!
- Occupies the space of only two telephone relays!
- Operates over the same wide range of pulse ratio and frequency as a chain of well-designed counting relays!

It's simple! It saves space! It saves money! ... Actuated by electrical impulses, the Kellogg Magnetic Impulse Counter performs the counting and marking function of a chain of 10 to 20 relays or of a two-magnet ten-point stepping switch, in less space and with top reliability! It has a wide application in many fields—from industrial control to any system where trains of impulses, such as generated by a telephone dial are to be counted.

# KELLOGG

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KELLOGG SWITCHBOARD AND SUPPLY COMPANY

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79 West Monroe St., Chicago 3, Ill. Dept. 46F

GET THE FACTS—MAIL COUPON TODAY!

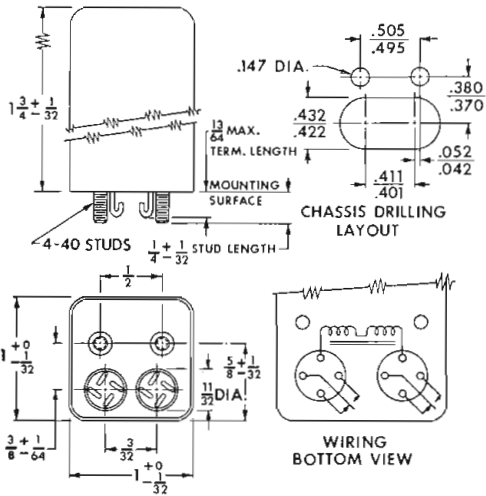
Please send me complete information regarding the Kellogg Impulse Counter.

NAME \_\_\_\_\_  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_

# Phaostron

## SENSITIVE MINIATURE RELAYS

PERFECTLY COUNTER-BALANCED



Contact arrangements up to and including DP DT 3 Amp at 28 volts D.C., or 100 Milliampers at 150 volts D.C. resistive load.

Hermetically Sealed.

Required coil power as low as 20 milliwatts.

Coil resistance up to 15,000 ohms.

Weight, maximum 3.5 oz.

**DUE TO ITS PERFECTLY COUNTER-BALANCED FEATURES THIS RELAY WILL WITHSTAND HIGH ACCELERATION, VIBRATION, SHOCK AND TUMBLING**

Mass Production Requirements Invited

Detailed information on request.

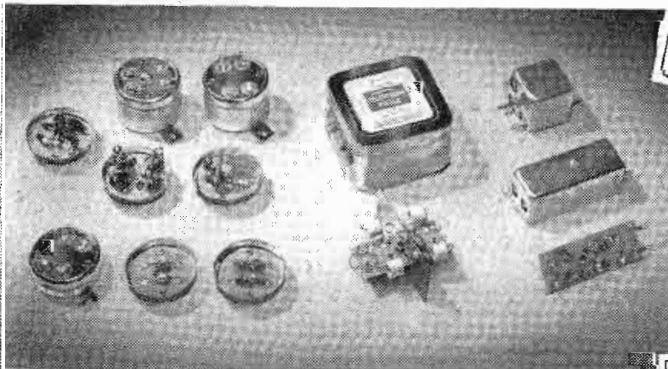
ENVIRONMENT FREE  
ELECTRICAL EQUIPMENT by



PHAOSTRON COMPANY • 151 PASADENA AVE. • SOUTH PASADENA, CALIF.

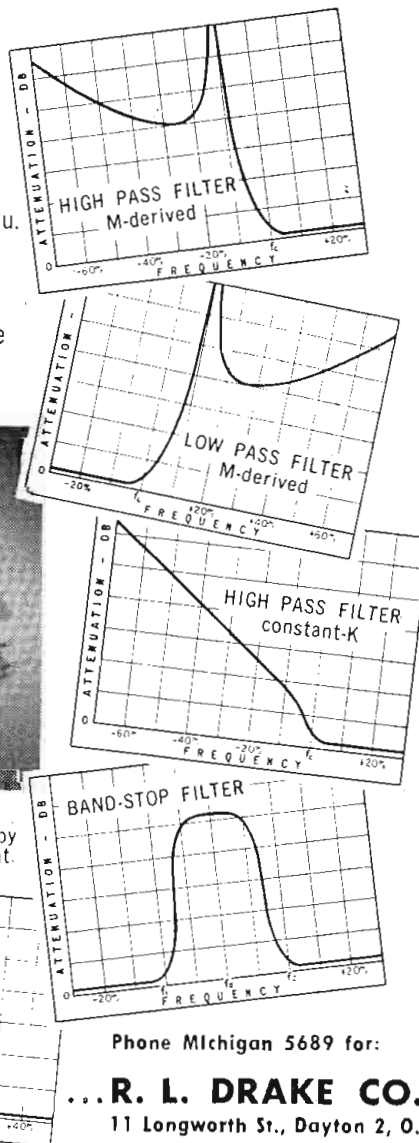
## DO YOU HAVE A TV Interference Problem?

A filter of the right attenuation characteristics, fitted to the proper frequencies, can solve it for you. Many TV set manufacturers have found this to be true and are including our filters in their new designs as a precaution against undesired responses. They have found it more economical to call upon R. L. Drake Co.'s experience and production facilities than to develop and make the filters themselves.



A few of R. L. Drake's adjustable or pre-set . . . IF, VHF, UHF . . . High Pass, Broad Band Rejection Filters and Traps being used by leading TV set manufacturers. Response curves shown at right.

If you need an effective yet inexpensive solution to your interference problem, why not contact our engineering department today? Your inquiries are invited. . . . .



Phone Michigan 5689 for:

**...R. L. DRAKE CO.**  
11 Longworth St., Dayton 2, O.



Charles E. Torsch has been appointed chief television engineer of the Rola Co., Inc., a division of the Muter Co., 2530 Superior Ave., Cleveland 14, Ohio. Mr. Torsch has had extensive experience with TV equipment, particularly deflection circuits. In 1936, a year after graduation from Johns Hopkins Univ. School of Engineering, he joined RCA. During the war, he specialized in sweep systems for guided missile TV cameras and receivers. In 1947, Mr. Torsch was employed by Bendix Radio. In 1948, he joined GE, organized their Cathode Ray Sweep Systems Engineering Group, and guided work on transformers and tubes for large, wide-angle picture tubes. Some 15 important patents have been issued to Mr. Torsch.

Dr. John Ruze, head of antenna design for U. S. Signal Corps Laboratories during World War II, has been appointed director in charge of Gabriel Co. Laboratories at Needham Heights,



Dr. John Ruze

Mass. He will also be responsible for the design and development of radar and IFF systems. In 1946, he served as assistant chief of the antenna laboratory for the Air Force Cambridge Research Center.

Carl Monauni has been named plant manager of the Hatboro TV picture tube division of National Union Radio Corp. Other new appointments are: Russ Zohn, production superintendent; and Ed Szkaradnik, plant engineering.

Isaac L. Auerbach, a World War II U. S. Navy radar officer, and former member of the Eckert-Mauchly Division of Remington Rand, Inc., Philadelphia, has been made special electronic equipment manager in the research activity of the Burroughs Co., Philadelphia. Mr. Auerbach is chairman of the Professional Group on Electronic Computers in the Philadelphia Chapter of the IRE.

D. W. Gunn has been promoted to the newly-created position of assistant general sales manager of radio tube and TV picture tube sales. He has been a member of the Sylvania organization since 1931 and has served in the following assignments: factory engineer,



D. W. Gunn

sales engineer, quality engineer, supervisor of quality control, and assistant to the general sales manager. He will continue as manager of equipment accounts, a position he has occupied since 1951.

Richard M. Kaplan, former management consultant, has joined CBS-Columbia, Brooklyn, N. Y., as chief of methods and production systems.

A. George Rogers has become manager of operations for Westinghouse, TV Radio Division, Metuchen, N. J. Previously, he was assistant division manager responsible for engineering and manufacturing. He also was in charge of the design, layout, and equipment of the new multi-million dollar Metuchen plant.

Dr. Harold J. Dawe, who has been product development director, has been appointed technical director responsible for all research and development undertaken by Acheson Colloids Co., division of Acheson Industries, Inc., Port Huron, Mich. Dr. Dawe is secretary of Research Division XII, Committee 2D of the American Society for Testing Materials.

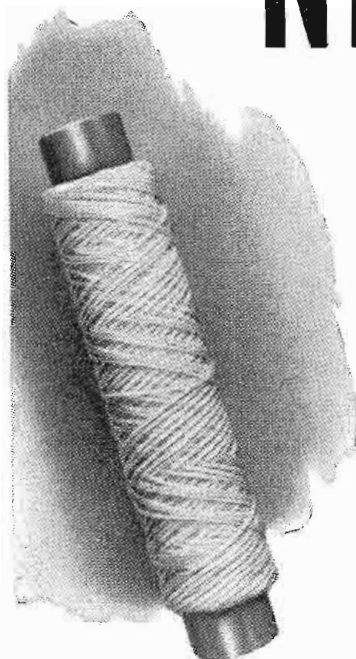
David Bellare, formerly with Reeves Instrument Co. and Federal Telephone and Radio Laboratory and a World War II Navy and Signal Corps school instructor, has been appointed project engineer supervisor for military equipment by CBS-Columbia, Brooklyn, N. Y.

Charles W. Finnigan, who was with Stromberg-Carlson 1941-1949, has returned to the company as chief electronics engineer where now he will be largely concerned with government contracts.

M. Clifford Agress, P. E., consulting engineer is now President & Sales Manager of A. J. F. Industries, Inc. During last war, Mr. Agress was chief engineer of Penn Boiler & Burner Mfg. Co., Lancaster, Pa., and also former project engineer with Lloyd Rogers & Co.

**NEW!**

# FUNGUS-PROOF NYLON LACING CORD and FLAT BRAIDED TAPE



Meets Army, Navy and Civilian "specs"

This sensational new development has proved to be a boon to electronic equipment. The special synthetic resin coating on Heminway & Bartlett's Nylon Lacing Cord and Flat Braided Tape resists the growth of mold and micro-organisms — factors most often responsible for the deterioration of linen and cotton lacing cords and tapes. They have high abrasion resistance and low moisture absorption. The finish has the desirable malleability of wax and is non-toxic to humans.

We'll be glad to send you full information and samples. Why not write us today.

The Heminway & Bartlett Mfg. Co., 500 Fifth Avenue, New York 36, Sales Offices: Chicago, Boston, St. Louis, Philadelphia, Cincinnati, San Francisco, Charlotte, N. C., Gloversville, N. Y.

Where there are  
**DOUBTS**  
instead of  
**FACTS**  
... LABEL IT  
with *EVERY*



**WHY LABEL?** When there are *doubts* instead of *facts* — a hesitation or unanswered question — label it with Avery Kum-Kleen labels! For example — in the electronics field — many manufacturers record assembly and testing steps on Kum-Kleen labels, which are easily peeled off and filed for future reference.

**HOW TO LABEL...** Kum-Kleen pressure-sensitive labels are just *laid on* with a finger-touch. They're self-adhesive... require no moistening, soaking or heating. Kum-Kleens **STAY STUCK**, and will not pop, peel or curl. With Avery patented dispensers, either hand operated or electric — labeling speeds are *5 times faster* than conventional methods.

**WHAT TO LABEL...** Nameplates, Trademarks, Prices, Guarantees, Diagrams, Caution, Approval Seals, Repairs, Masking Instructions, Routing, Sales Pitch... and many others.

*Kum-Kleen* — the original pressure-sensitive label — is a product of **EVERY** labels in your business?

**EVERY ADHESIVE LABEL CORP.**  
117 Liberty St., New York 6 • 608 So. Dearborn St., Chicago 5  
1616 So. California Ave., Monrovia • Offices in other principal cities  
• Write for case histories, samples and prices.

**ALLEN-BRADLEY  
RESISTORS?**

**ALLEN-BRADLEY  
POTENTIOMETERS?**

**WE'RE LOADED WITH THEM!**

*Absolutely the LOWEST prices!*

*Immediate Delivery!*

*Write or call Resisco NOW!*

**R**esisco Corporation  
SERVING THE WORLD OF ELECTRONICS  
366 BROADWAY, NEW YORK, 13, N.Y.  
REctor 2-0284



William W. Managan has been made chief engineer of the Victoreen Instrument Co., instrument division, Cleveland, Ohio. He joined the company in 1947 following service with the Naval Research Laboratory, Washington, D. C., where he concentrated on radar design for three years.

Elliott Mehrbach has been appointed chief engineer of Maryland Electronic Manufacturing Corp. of College Park, Maryland. Previously Mr. Mehrbach was project engineer in charge of the transmitter section in the Research Di-



Elliott Mehrbach

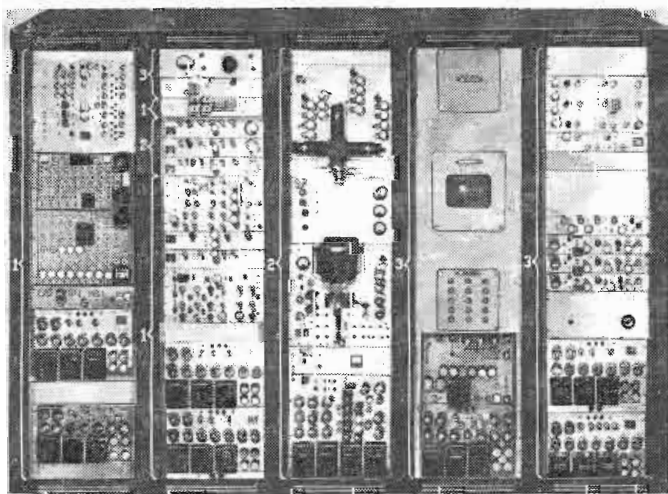
vision of Allen B. DuMont Lab., Inc., of Passaic, N. J. From 1938 to 1942 he was a radio engineer for Federal Telegraph Co. in Newark, N. J., where he worked on the design and development of air navigation aids and miscellaneous transmitting equipment. He then joined J. H. Bunnell & Co., where he later became assistant chief radio engineer. After holding engineering positions in Radio Receptor Co. and Curtiss Wright Co., he joined Allen B. Du Mont Labs., Inc.

Francis J. Gaffney has been appointed director of engineering for the Guided Missiles Division of the Fairchild Engine and Airplane Corporation, Wyandanch, L.I., N.Y. Mr. Gaffney, formerly chief engineer and general manager of the Polytechnic Research and Development Company, is known for his work in microwave measurement and pulse circuit techniques. During World War II he headed the test equipment group in the MIT Radiation Laboratories from which came many wartime advances in radar and microwave equipment.

Jack Walker has been appointed Director of Engineering Consultation Service of Wakmann Watch Co., 15 W. 42 St., New York, N. Y. The service will furnish technical assistance to customers requiring special timer designs.

Albert J. Frankel has been appointed buyer for the Civilian Program of CBS-Columbia Inc., set manufacturing subsidiary of the Columbia Broadcasting System.

**NTSC**



**COLOR  
TV**

**TELECHROME'S NTSC "COLOSSUS"**

Based upon solving many color TV problems we have evolved the NTSC Colossus — a unit specifically designed to enable the Industry to embark promptly on color programs by acquiring color equipment as required.

America's leading Radio-TV organizations are now using Telechrome equipment.

Write or phone for information — and delivery

**GROUP 1** — Minimum Equipment consists of encoders, color bar, burst, sub-carrier, sync generators, phase equalizer, and incidental power supplies.

**GROUP 2** — Additional Equipment includes flying spot picture generator and gamma amplifiers; permits encoding of 35 mm color slides.

**GROUP 3** — Complete Equipment contains complete decoding and tri-color display, video amplifiers and sync separator, picture and sound transmitter.

COLOR TV



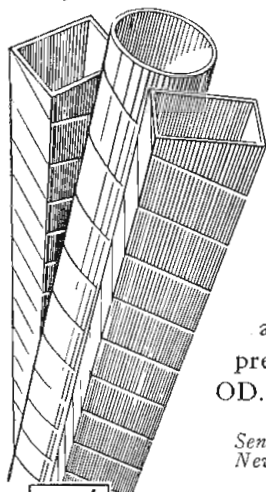
THROUGH ADVANCED RESEARCH & DEVELOPMENT

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# PRECISION paper tubes

Rigid manufacturing standards are employed in the construction of Precision Paper Tubes to provide high quality and cost economy. Close tolerance control insures exacting adherence to your specifications, plus maximum insulation, moisture-resistant and heat dissipation characteristics.



Precision Paper tubes are spirally wound and die-formed under pressure for increased strength (15 to 20%) and lighter weight. Available in kraft, fish paper, acetate, combinations and phenol impregnated . . . any shape, length, ID or OD.

Send specifications for free sample and ask for New Arbor List of over 1500 sizes.

**PRECISION PAPER TUBE CO.**  
 2057 W. Charleston St. Chicago 45, Ill.  
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 Also Mfrs. of Precision Coil Bobbins

Double re-entrant, 10" horn diameter, outdoor loudspeaker.  
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*Specialists in*  
**Weatherproof Audio Equipment**  
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**U. S. Coast Guard approved.**

- High Power Speakers 15" horn diameter—all bronze construction.
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- Amplifiers, Power Supplies, Rectifiers, built to customers' specifications.
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Capacity for Prime or Sub-contracts in Electric or Electronic Equipment

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 450 Avenue of the Americas New York 11, N. Y.

# From miniature to giant... **insuline** **METAL GOODS** *for every requirement!*



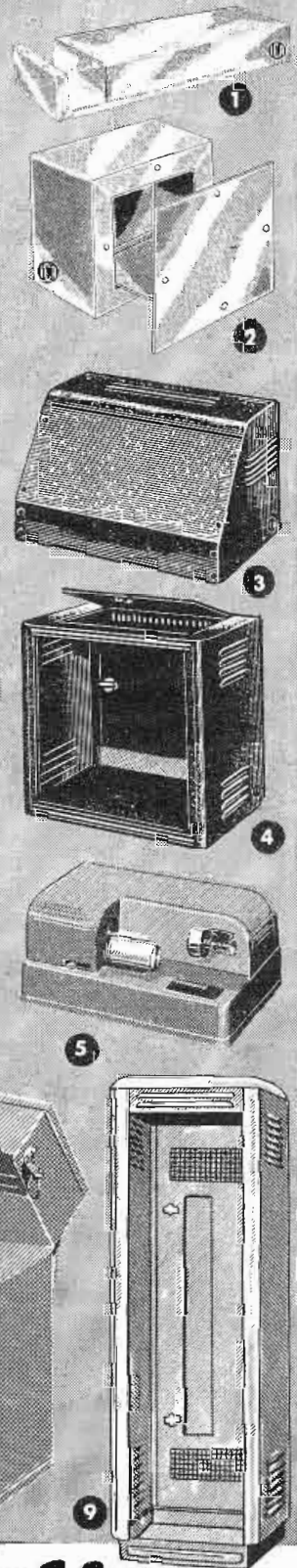
INSULINE manufactures one of the most diversified lines of metal goods...built-up in the past 32 years by supplying every type needed by manufacturers, servicemen, engineers and hams. Huge stocks are maintained from the smallest cabinet to massive transmitter racks . . . for immediate shipment.

If your requirements are special, INSULINE can produce anything in metal . . . steel, aluminum, brass, copper, etc. . . to your specifications. Our facilities are adequate to manufacture your complete job from beginning to end . . . in fast time. Send prints and specifications for estimate.

### Guide to Illustrations

1. Slip Cover Aluminum Box.
2. Utility Cabinet with built-in chassis.
3. Sloping Panel Cabinet.
4. Multi-Use Cabinet.
5. "Watchmaster" Precision Timer (American Time).
6. Chassis Base.
7. Portable Transmitter Cabinet.
8. Portable Amplifier Case.
9. Transmitter Rack.

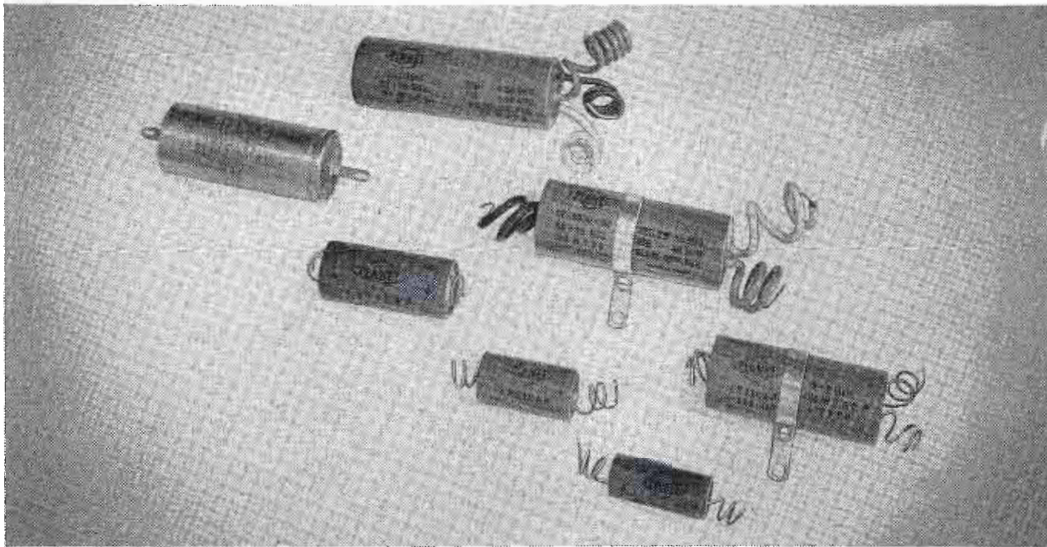
Write Dept. TT-6 for latest catalog. Over 2000 items, including metal goods, tools, hardware, components, television and accessories.



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1 year service guarantee

Custom engineered to your specifications or supplied from stock. Planet capacitors meet the highest standards of the industry. Every capacitor is tested mechanically and electrically throughout its manufacture.

This rigid system of quality control makes our unconditional one-year guarantee possible. But making Planet capacitors correctly from the start means reasonable prices too!

WRITE for Catalog T-T listing specifications on stock items.

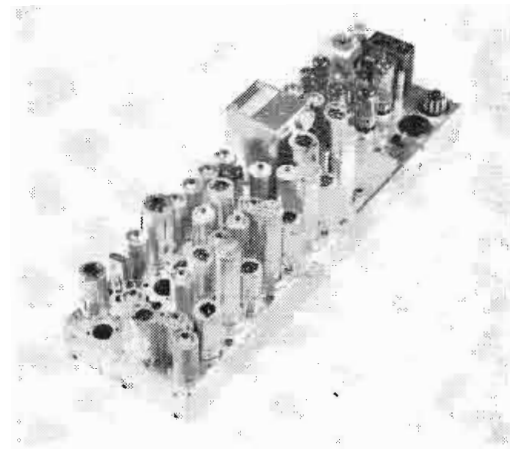
### PLANET MANUFACTURING CORPORATION

225 BELLEVILLE AVENUE  
BLOOMFIELD, N. J.



## Designing for the 460-MC Band

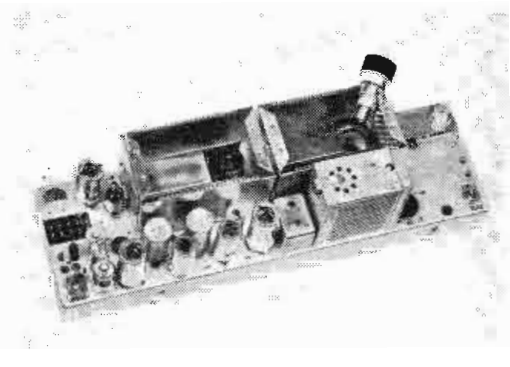
Designing mobile communications equipment for the 460-mc band presents many new problems not evident in the VHF bands, 30-50 mc and 152-162 mc. As reported by J. F. Byrne and A. A. MacDonald of Motorola, the develop-



450-470 MC receiver weighs 7.5 lbs., and measures 4-7/8 wide x 16-1/2 long x 4-9/16 in. high

ment of units to cover both the 450-460 mc commercial band and 460-470 mc Citizens band had to overcome the "bugaboos" of untried equipment and propagation problems.

In designing the receiver, a rule of thumb guide was employed which stated that drift between receiver and transmitter could not exceed  $\frac{1}{2}$  of the receiver bandwidth. For a 30 kc bandwidth, this would mean 1.25 kc for each, or a stability of  $\pm 0.00027\%$ —obviously too stringent. By using AFC with an 8:1 correction factor, the total drift could be as high as 16 kc without exceeding the total 2.5 kc rule-of-thumb limit. Other receiver characteristics in-



Transmitters cavities are placed end to end

clude 1  $\mu$ v sensitivity for 20 db quieting,  $\pm 15$  kc selectivity at 6 db, and spurious signals below 85 db. It uses 6J4 r-f tubes, weighs 7.5 lbs., and measures 16 $\frac{1}{2}$  x 4 $\frac{7}{8}$  x 4 $\frac{9}{16}$  in.

The 450-470 mc transmitter employs a 2C39A power triode with a plate efficiency of 65%. While rated at 20 watts, tripler and final amplifier cavities have been placed end-to-end so that in base station applications a blower can be used to raise the r-f power output to 40 watts. Spurious emission in the band is below 85 db, and outside of the band below 60 db. Frequency stability is 0.0005% ( $\pm 2.25$  kc) and  $\pm 15$  kc devia-

# Specification Coils

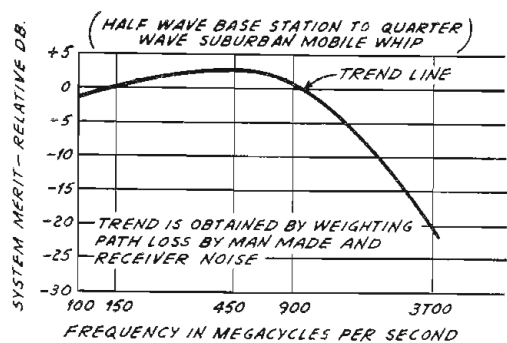
**—for every requirement—radio, FM, TV and Government Applications!**

Including Universal, Bank Wound, Universal Progressive and Solenoid. All are precision-built to highest engineering standards and conform exactly to specifications. For uniform high quality, prompt delivery and economical unit costs, specify coils by Fugle-Miller. Radio, TV and JAN specifications are a specialty. Phone, wire or write for quotations:

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MAIN STREET, METUCHEN, NEW JERSEY  
Telephone: Metuchen 6-2245





Communication system merit relative to 150 MC. Even without high gain antennas, note 460 MC.

tion equals 100% modulation. Weight is only 7.5 lbs., and size is 16½ x 4 7/8 x 5 1/4 in.

The UHF system is in many ways superior to the VHF. For example, in a test on smooth earth, the 160-mc proved 6 db better in range, but in a suburban area the 450-mc unit showed a 9 db lower noise level, or overall 3 db superiority. In urban areas, where man-made noise is greatly reduced at UHF, 450 mc showed a noise level 12 db below 150 mc.

### Statistics Refute TV Cliches

The Columbia Broadcasting Co. has come up with an interesting set of statistics to refute several old cliches such as: "People will give up TV once the novelty has worn off"—"TV is only an evening medium"—"TV is too expensive"—and others.

#### End of 1952:

TV in 50% of homes (21 million)

#### End of 1954:

TV in 65% of homes (35 million)

#### June 1952:

TV covers 2/3 of country

#### June 1953:

TV covers 2/5 of country

#### Average daily set use:

1950—4 hrs. 29 min.

1951—4 hrs. 43 min.

1952—4 hrs. 49 min.

#### Sets owned longer are viewed longer daily

Sets purchased during

1951—4 hrs. 12 min.

1950—4 hrs. 41 min.

before 1950—4 hrs. 57 min.

#### Daily daytime TV viewing

1951—61 min.

1952—70 min.

#### Sponsored weekly time for 4 networks

Jan. 1, 1949—30.5 hrs.

Jan. 1, 1953—100.5 hrs.

#### Gross billings of 4 networks

1949—\$12,295,000

1952—\$180,795,000

#### Sponsor costs

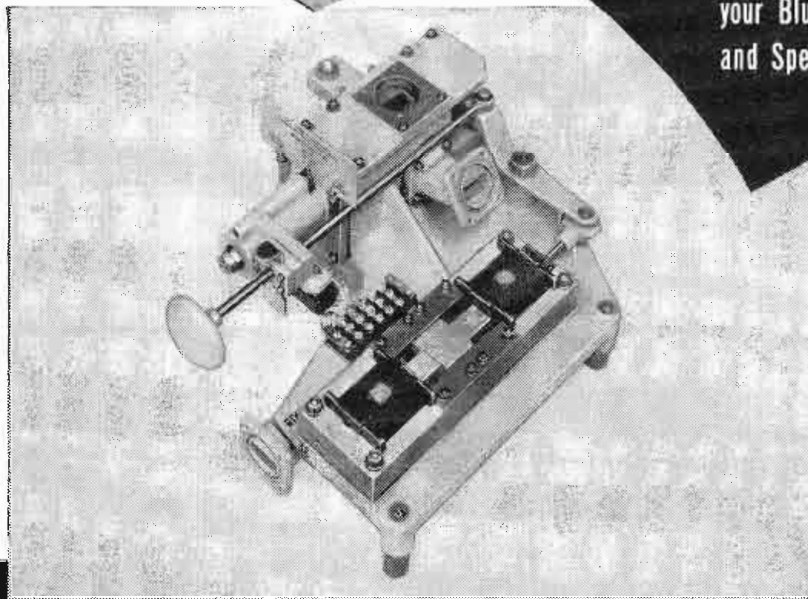
Hourly rate up 8.5 times since 1949

TV audience up 21 times

#### Cost per 1000 homes

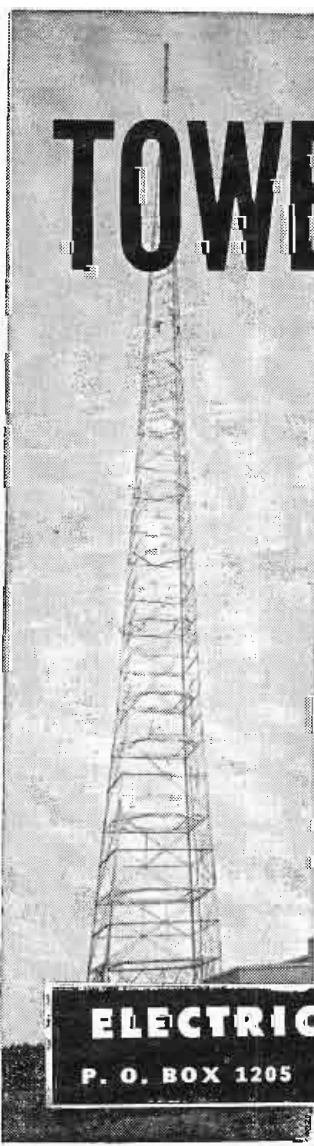
	TV time	TV time & talent	8 leading newspapers & magazines	Newspapers
1949	\$3.93	\$8.47	\$2.79	\$3.57
1950	2.89	4.74	2.71	4.32
1951	2.03	2.96	2.74	4.54
1952	1.80	2.70	3.06	4.87
1953	1.59	2.39	3.20	5.43

Microwave Assemblies, Radar Components, and Precision Instruments . . . manufactured to your Blueprints and Specifications.



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Tower installation illustrated here is station WSAU, Wausau, Wisconsin

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**BOOKS**

**Speech and Hearing in Communication**

By Harvey Fletcher. Published 1953 by D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N.Y. 461 pages. Price \$9.75.

Another valuable contribution to the Bell Laboratories Series, this book reports a vast amount of research carried on in the Laboratories to determine, quantitatively, how well a listener will recognize sounds spoken into a transmission system of described characteristics. The inclusion of 246 figures and more than 90 tables is an indication of the comprehensive coverage of experimental data. The reader is carried from the fundamental mechanisms of speaking and hearing through binaural effects and the space-time pattern theory of hearing. This latter theory, originally presented in a paper by the author published in 1930, integrates the individual theories of space and time patterns describing how the ear's nerve impulses inform the brain of time sequences in wave motion. Much experimental work during the past 23 years substantiates the principal parts of the theory.

Perhaps the most valuable information in the book are the methods of measuring speech recognition on an objective basis, and the specification of talker-listener pairs. These chapters should provide a firm basis to guide the work of radio engineers engaged in the design of speech communication equipments.

Technically, this authoritative work might be considered a second edition of the author's book, *Speech and Hearing*, published in 1929. However, the wealth of new material that has been added makes it essentially new. It should go a long way toward clearing up the many misconceptions of the nature of speech and hearing which are bandied about in engineering circles—sometimes by people who ought to know better. AJF

**Sound Reproduction**

By C. A. Briggs. Published 1953 by Wharfedale Wireless Works, England. 3rd Ed. U. S. agent, British Industries Corp., 164 Duane St., New York 13, N.Y. 368 pages. Price \$3.50.

*"Heaven open'd wide Her ever-during gates, harmonious sound on golden hinges moving. Silence was pleas'd."*

With this sublime quote from Milton, the author opens the third edition of his welcome book. It is indicative of the combined scientific and artistic appreciation with which Mr. Briggs approaches the subject of sound. The publishers report that the first two editions, 22,000 copies, were sold out within a few months of publication, and there is no reason to expect that this revised and enlarged edition should fare any worse.

One of the most interesting features

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of this volume is the large number of illustrations—315 of them—which includes 80 original oscillograms and a number of photomicrographs. The book is broadly divided into two parts, Loudspeakers and Recording, with 28 chapters and reference tables. These include high fidelity, enclosures, response, recording techniques, needle wear, noise and many others. Such comprehensive coverage in this size book is not without its drawbacks, namely, that certain aspects of the audio field can only be discussed sketchily. Nevertheless, for the most part, the discussions of methods and equipment, on a not too technical level, are sufficiently thorough to permit the book to be classified as excellent, and well worth the purchase price.

AJF

### Burroughs Name Change

Stockholders of Burroughs Adding Machine Co., Detroit, which is building a new \$3,000,000 air-conditioned Research Center in suburban Paoli, Pa., have voted to change the name of the company to "Burroughs Corporation."

Since Burroughs has added many new types of machines, equipment and supplies, the original name was not considered sufficiently descriptive. Ticketing machines, various types of ordnance instruments and micro-film—as well as accounting, adding, bookkeeping, calculating and cash registering machines—are now manufactured and sold by the 65-year old company.

The company's authorized common stock was increased from 5,000,000 to 7,500,000 shares. Mr. John S. Coleman, President, stated that the firm at present had no plans for issuance of the additional shares. Burroughs Research, which is expected to move to the new Paoli Laboratory early in 1954, is temporarily located at 511 North Broad Street, Philadelphia.

### AMMONIA-TYPE PRINTER



A new medium-priced ammonia-type white-printer, the Speed Master Model "5," has been developed by Peck & Harvey. Printing speed of tracings and records is up to 14 ft./min. Peck & Harvey are at 5650 N. Western Ave., Chicago, Ill.

Style 18 (Medium),  
500 yd. spools,  
black or natural.

Write for **FREE**  
samples and prices.

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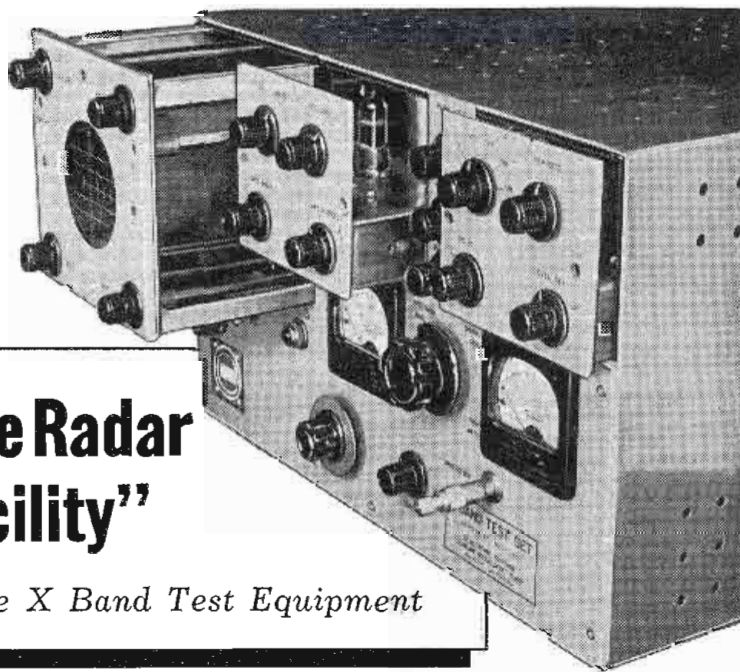
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### Model 109



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**ELECTRO**

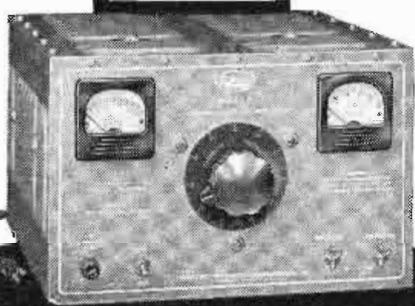
*filtered DC  
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1%

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**RIPPLE at  
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withstand high overloads.

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Canada: ATLAS RADIO CORP., LTD., TORONTO  
PRECISION INSTRUMENTS SINCE 1944

**General Electrosonics  
Merger Announced**

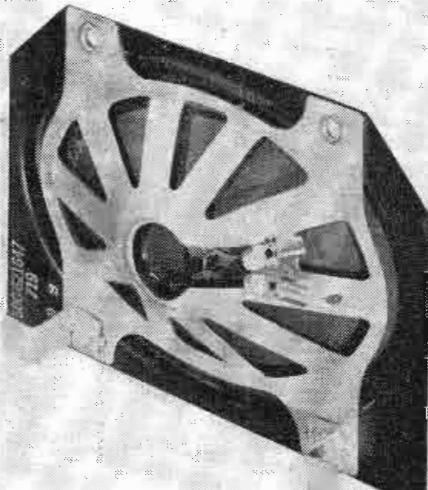
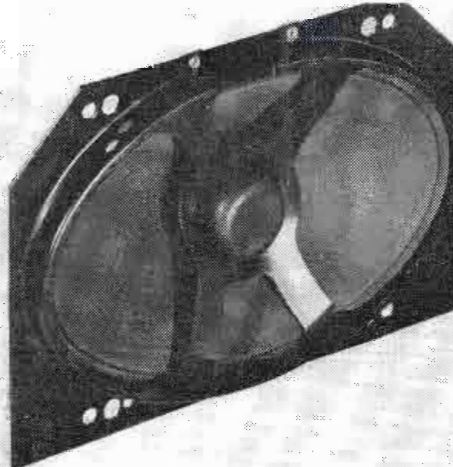
General Electrosonics, Inc., develop-  
ers and manufacturers of specialized  
electronic equipment, with factories in  
New York City and New Rochelle, N. Y.,  
has merged with Segal Lock and Hard-  
ware Co., Inc., according to an an-  
nouncement by G. Emerson Pray, Pres-  
ident of General Electrosonics.

General Electrosonics, Inc. was or-  
ganized in 1951 by Mr. Pray, who as  
assistant chief of the radio receiver divi-  
sion at the Naval Research Labora-  
tory, Washington, D. C., is credited with  
developing the first successful Navy  
radar receiver.

Under the plan of the merger, Mr.  
Pray and Capt. L. B. Blaylock, vice  
president of the company, who was for-  
merly in charge of the research and de-  
sign section of the radio division of the  
Bureau of Ships, will continue in the  
active management of General Elec-  
trosonics. However, the factory will be  
consolidated at the plant of the Nor-  
walk Lock Co., Norwalk, Conn., major  
producing subsidiary of Segalock.

Frank Grisanti, vice president in  
charge of production of the Norwalk  
Lock Co., was formerly associated with  
Sperry Gyroscope in the manufacture  
of electronic equipment.

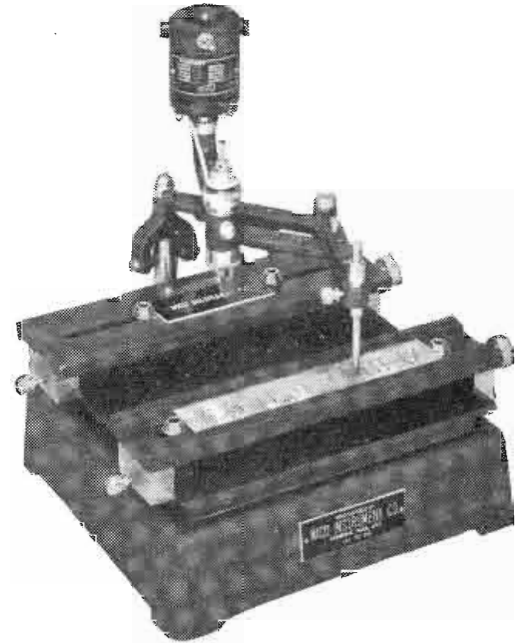
**MAGNET-IN-FRONT SPEAKER**



A new inverted PM speaker with magnet located  
in front of the cone instead of the rear, has  
been announced by Motorola. Developed by  
Gordon Carbonneau in collaboration with Mo-  
torola engineers, the compact 5 x 7 in. unit  
weighs only 12 oz. Important point is that  
lightweight cone allows wide-angle dispersion  
from rear. Simple frame, more efficient pot,  
new cementing method are also featured

# MICO

**Precision Apparatus  
ENGRAVERS**

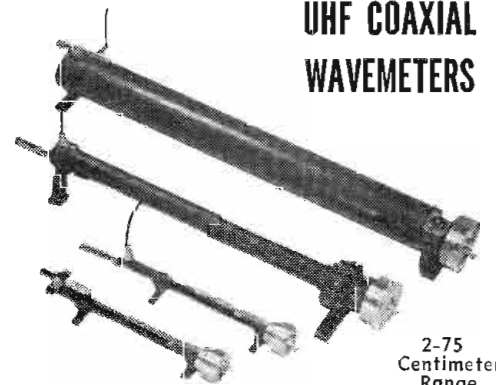


**FEATURES**

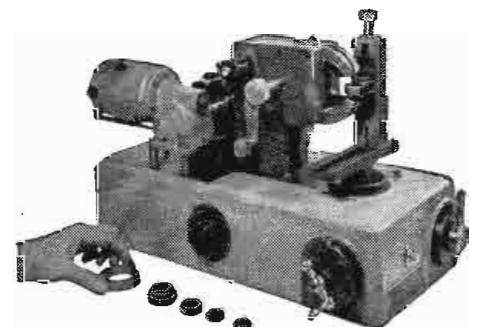
1. Four reduction ratios, 1.5:1, 2:1, 3:1, and 4:1.
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| MODEL 501  | 4 to 20 Centimeters                 |
| MODEL 402A | 2 to 10 Centimeters                 |
| MODEL 402B | 2 to 10 centimeters (Reaction Type) |



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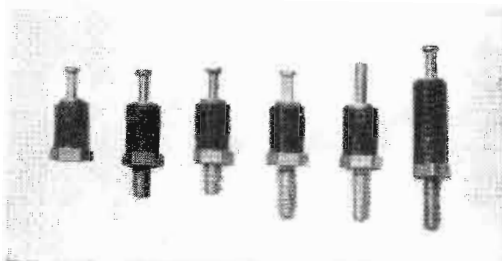
**GARDE**

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Insulated Standoff**

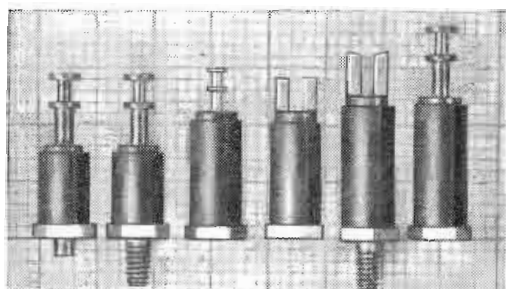
**Terminals**

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in accordance with latest revisions of  
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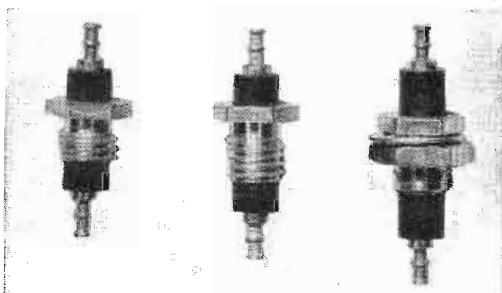
▼ **SUBMINIATURE**



▼ **MINIATURE**



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Terminal and Mounting Insert styles  
shown are available in all body sizes  
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REPRESENTATIVES in Principal Cities

### New Color TV Film Scanner

Color TV movies may be transmitted with a new film scanner developed by Philco Corp. According to Leslie J. Woods, Philco vice president-director, Research and Engineering, it will be of immediate value to the broadcaster because it results in reception of black-and white pictures from motion picture film vastly superior to those presently received. The pictures have improved resolution, superb half-toned reproduction, extreme steadiness and complete freedom from flicker.

The Philco Television Film Scanner is basically a rotating many-sided glass prism. Since the film is continuously immobilized by optical means, the transition from one frame to the next is accomplished without any interruption of the light. Stroboscopic effects with scanning have been avoided. Instead, a gradual optical fadeout substitutes one frame for another in succession without changing the average illumination. Perfect film tracking, elimination of the film burning problem and easy adaptability to all existing foreign and domestic television standards are features of the new scanner. Produced by the Philco Government and Industrial Division, present schedules assure availability of units in late 1953.

### Re-radiated TV

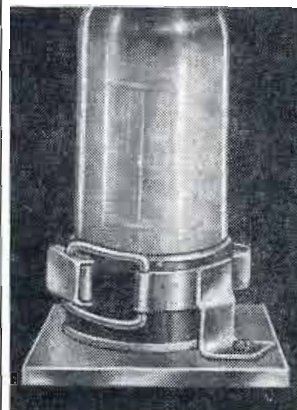
Demonstration of the IRESKO relay system of TV on-frequency re-radiation is soon to become a reality at Palm Springs, Calif. The system, a development of International Research Associates of Santa Monica, Calif., is capable of re-radiating multiple VHF or UHF TV signals into areas normally cut off from direct reception due to terrain barriers. The use of the IRESKO relay system will give the Los Angeles TV stations an extended service area to include 40,000 to 50,000 additional viewers. It was developed in 1950 and was successfully tested during the summer of 1951. In the past three years numerous improvements have been made on the system in order to demonstrate the feasibility of such a device to the originating stations. Demonstration tests of the IRESKO relay system will be made in the Palm Springs area during the summer and fall of 1953, using the recently issued experimental license KM2XFA.

### New Name for CBS-Hytron

Bruce A. Coffin, President of CBS-Hytron, Danvers, Massachusetts, a division of Columbia Broadcasting System, Inc., announces a change in his company's name. Formerly Hytron Radio & Electronics Co., the company name is now CBS-Hytron. CBS-Hytron, the radio and TV tube division of CBS, also manufactures germanium diodes and transistors.



they  
can't  
shake  
loose...



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THEM  
TIGHT  
with a**

**BIRTCHER CLAMP**

There is a Birtcher Clamp... or one can be designed... for every tube you use or intend to use.

Regardless of the type tube or plug-in component your operation requires... and regardless of the vibration and impact to which it will be subjected... a Birtcher Tube Clamp will hold it securely and rigidly in place.

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## "Fluid Sound" Phono Pickup

Quantity production of a "fluid sound" phonograph pickup providing high fidelity reproduction at low cost will be started in early 1954 by the new Lindberg Instrument Company, Inc., of San Antonio, Tex.

The announcement was made by Bruce D. Eyttinge, vice-president and general manager of the company which came into being as a result of evaluation of the Barry C. Warner patents by the Institute of Inventive Research and its affiliate, Southwest Research Institute of San Antonio.

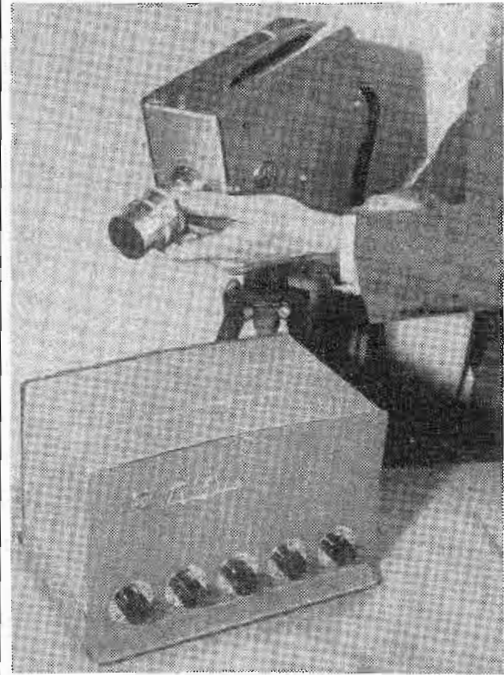
The fluid sound pickup, which has aroused the interest of the phonograph industry, has been exhaustively tested and found acceptable by several large manufacturers. It will sell at a cost comparable to ordinary crystal pickups.

Employing fluid damping and coupling, the cartridge does not require its sapphire stylus to do the work of generating voltage output. The stylus motion is used only to modulate the applied external dc current as it flows through a fluid sealed in the cartridge.

## Kuljian Establishes Electronics Division

A new electronic division has been established by The Kuljian Corp., Engineers and Constructors, with headquarters in Philadelphia. Bernard T. Svihel who has been placed in charge of the new department, comes to the company with over 15 years experience in the radio and electronic industry, having been responsible for extensive design and research work in analog computers, differential analyzers and servo-mechanisms.

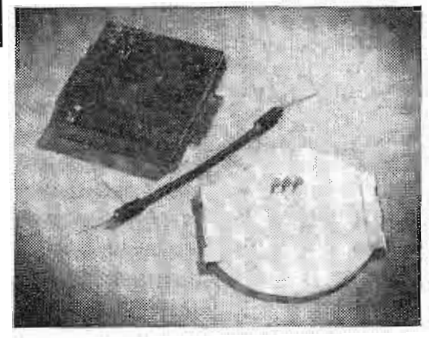
### PRIVATE-LINE TV



"Private-line" TV for schools, hospitals, prisons, stores, small factories, and even homes is made practicable by low price, small size, and simplified operation of compact closed-circuit TV system, known as the RCA "TV-Eye." It utilizes any standard home-type receiver as a monitor. Complete unit, including camera and control box weighs less than 20 lbs.

# BREW DELAY LINES

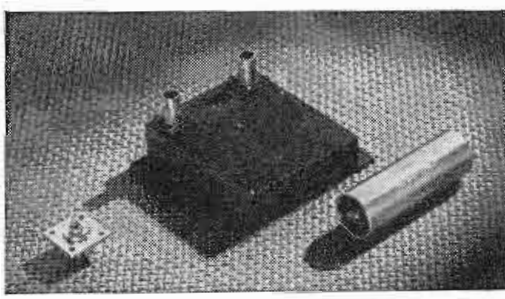
*accuracy  
guaranteed*



### Flexible Delay Lines

Meet exacting requirements. Special delay measurement apparatus insures complete uniformity and close tolerances. Two types . . . Short Lines (type "A"), delays from .1 to 3 microseconds and Long Lines (type "B"), delays from 2 to 10 microseconds.

Specifications: Distributed constant type passive circuit networks. Impedance 1200 ohms±15%. Delay held to .05 microseconds tolerance. 2 MC bandwidth. Available in stick form or in cans. Hermetically sealed, non-nutrient construction. Meet JAN specs.



### Ultrasonic Delay Lines

Solid Ultrasonic delay lines are available in either pure fused Quartz for long, precise, compact delay units or in a new temperature stable material up to 75 microseconds. All lines are in shock proof hermetically sealed mounts with appropriate contact provisions.

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*Brew Delay Lines are used in both government and commercial applications. Designers and manufacturers find Brew's engineering "know-how," manufacturing facilities, prompt delivery, and cooperation go a long way in solving their needs. Send today for catalog information . . . or send us your requirements.*

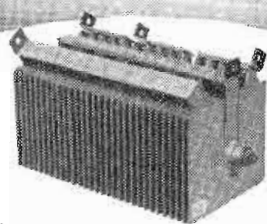
**BREW**

RICHARD D. BREW  
and Company, Inc.  
106 Concord Ave., Belmont 78, Mass.

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PATENTS NO. 2618692 & 2620394

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Versatile low-cost rectifiers that have found application in all types of electronic equipment as well as radio and television receivers. A complete line is available.



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### Diodes

Currently available in two sizes, (1/8" and 5/16" housings) Sarkes Tarzian diodes are designed for use as limiters, bias voltage, low current relay voltage and many other very low current applications.



### High Voltage

This popular line of tubular rectifiers offers the design engineer a compact—long lived high voltage—low current source of DC power.

Please write, wire or phone for complete information on all types of Sarkes Tarzian Selenium Rectifiers.



## Sarkes Tarzian, Inc. RECTIFIER DIVISION

Dept. T-3, 415 N. College Ave., Bloomington, Ind.

## Olympic Acquires Electrona Corp.

Dr. R. Bowling Barnes, president of Olympic Development Co., Stamford, Conn., has announced the acquisition of the Electrona Corp., Irvington, N. J., by Olympic Radio and Television, Inc., of Long Island City, N. Y. The latter is the parent firm of Olympic Development.

The Electrona Corp. will continue operations at its Irvington laboratories under the direction of Dr. Carl Bosch, who becomes vice president and director of research of Electrona. It will be directly affiliated with the Olympic Development Co.

### New Gates Office

The Gates Radio Co., Quincy, Ill., manufacturer of radio transmitting equipment and electronic devices, has opened a new and larger office in New York City, located at 51 East 42nd St. The New York export office is located at 13 East 40th St.

## Coming Events

June 9-11—2nd International Aviation Trade Show, Hotel Statler, New York, N. Y.

June 15-19—Exposition of Basic Materials for Industry, Grand Central Palace, New York, N. Y.

June 16-24—International Electro-Acoustics Congress, The Netherlands.

June 20-Oct. 11—German Communication and Transport Exhibition, Munich, Germany.

July 10-12—6th Annual National Convention of the ARRL, Shamrock Hotel, Houston, Texas.

Aug. 1-5—National Audio-Visual Trade Show, Hotel Sherman, Chicago, Ill.

Aug. 17-18—Symposium on Statistical Methods in Communication Engineering, Berkeley, Calif.

Aug. 19-21—Western Electronic Show and Convention, San Francisco Municipal Auditorium, San Francisco, Calif.

Aug. 25-28—APCO, 19th Annual Conference, Sheraton-Cadillac, Detroit, Mich.

Aug. 29-Sept. 6—West German Radio and TV Exhibition, Duesseldorf, Germany.

Sept. 1-3—International Sight and Sound Exposition, Palmer House, Chicago, Ill.

Sept. 9-12—NEMA, Haddon Hall Hotel, Atlantic City, N. J.

Sept. 21-25—ISA 8th National Instrument Exhibit, Sherman Hotel, Chicago, Ill.

Oct. 5-9—74th Convention of the SMPTE, Hotel Statler, New York, N. Y.

Oct. 19-21—RTCM Fall Assembly Meeting, Edgewater Beach Hotel, Chicago, Ill.

APCO: Assoc. Police Communication Officers  
ARRL: American Radio Relay League  
ISA: Instrument Society of America  
NEMA: National Electrical Mfrs. Assoc.  
RTCM: Radio Technical Commission for Marine Services  
SMPTE: Soc. of Motion Picture and TV Engineers

## IF YOU NEED SMALLER COMPONENTS

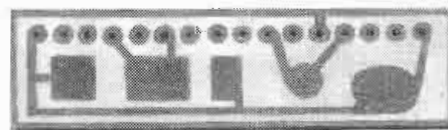
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# GLENNITE

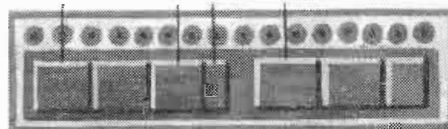
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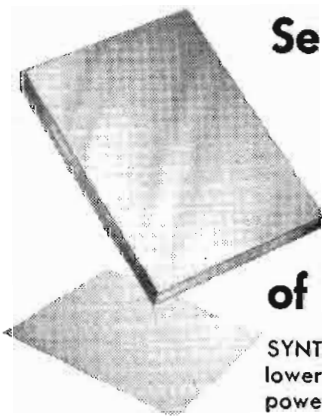
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In addition to combining high fire-and-arc-resistance with excellent mechanical and chemical properties, this new grade of SYNTHANE laminated plastic offers a considerable saving whenever its use is appropriate. G-8 costs less than continuous filament glass-base material—and its dielectric properties are good. Ease in fabrication makes G-8 adaptable to many electrical applications. To learn more about this new material—about its high strength, light weight, low inertia, fire- and corrosion-resistance, and combinations of these properties and a sample for examination—just clip and send the coupon below.

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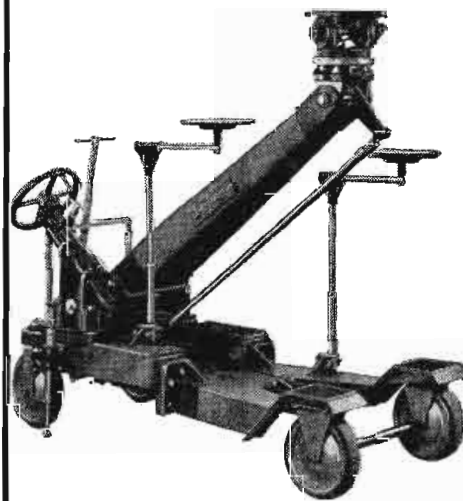
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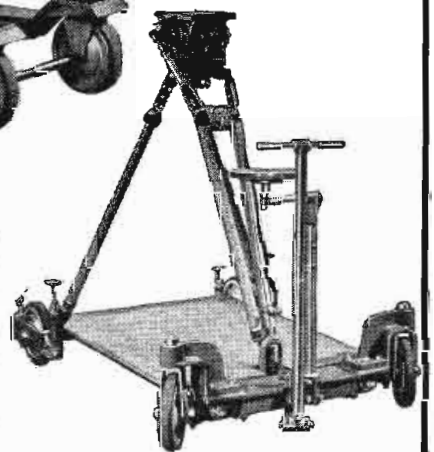


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FROM: Chief Design Engineer  
TO: Purchasing Agent

Contact G-E Components Dept.-- This is the company we've hoped would enter the etched circuit board business. W.L.D.



**"PRINT-WIRE" CIRCUIT BOARDS**

In keeping with its tradition of constant research for new and improved products, the General Electric Co. has devoted special effort to the field of etched circuit boards. In recent months the Components Department has been producing solder-plated etched circuit boards for specialized military use and forward looking commercial products. High acceptance accorded this product clearly indicates the possibility of much broader applications.

The Components Department would appreciate the opportunity of discussing your *high quality* requirements for all types of circuit boards. Make full use of this new electronic component that:

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Our engineers are prepared to discuss ways in which G-E "PRINT-WIRE" circuit boards can solve your problems. Write or wire us today! General Electric Company, Components Department Section 4863, Electronics Park, Syracuse, N. Y.

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**GENERAL ELECTRIC**

**BULLETINS**

**Educational TV**

RCA Victor has prepared an analysis of the equipment and operating costs of typical educational TV stations. The booklet will be sent free on request made to Educational Division, RCA Victor, Camden, N. J.

**Mass Spectrometer**

Bulletin CEC-1824 illustrates, describes, and discusses the Model 21-610 mass spectrometer produced by Consolidated Engineering Corp., N. Sierra Madre Villa, Pasadena, Calif.

**Thermistors**

The 36-page Veco Data Book discusses the technical aspects and applications of bead, disk and washer, and rod thermistors. Copies are available at Victory Engineering Corp., Springfield Rd., Union, N. J.

**Servo Components**

Staff, plant-equipment, and operations of Belock Instrument Corp., College Point, N. Y., are presented in a 12-page color brochure. Also, a 20-page loose-leaf catalog contains dimensional drawings and part numbers of standard high-speed servo and computer components made by the company and the first filler sheets of a BICO miniature component and accessories line in course of development.

**TV Components**

Illustrations and detailed descriptions of ion traps, centering devices, correcting magnets, speakers, antennas, transformers, and focomags are shown in the new catalog by Heppner Mfg. Co., Round Lake, Ill.

**Power Plants**

D. W. Onan & Sons Inc., have issued a 2-color folder which shows portable and mobile electrical plants providing primary power for TV and radio remote broadcasting and also serving as standby power for communications and dispatching centers.

**Piezotronics**

The Sale Promotion Section, 28G. Brush Electronics Co., 3405 Perkins Ave., Cleveland, O., will supply upon request detailed descriptions of a 24-page company brochure describing Piezotronics, and a supplementary 32-page brochure, "Piezotronic Technical Data" covering piezo-electric materials, applications, circuitry, etc.

**Cartridge Replacement Manual**

The new Phonograph Cartridge Replacement Manual 66A, covering 1900 phonoradio-TV combinations of units produced 1938 through 1952, can be obtained from Shure Bros., 225 W. Huron St., Chicago, Ill.

**Transformers and Coils**

RCA printed-circuit components used in TV receivers utilizing inter-carrier sound systems and picture-if and sound-if systems of 45.75 and 41.25 mc, respectively, are the subject of a booklet published by Commercial Engineering, RCA Tube Dept., Harrison, N. J.

**Germanium Diodes**

Bulletin GD-1 describes the characteristics and advantages of the new Germanium diodes produced by International Rectifier Corp., 1521 E. Grand Ave., El Segundo, Cal.

**Magnetic Iron Powders**

Catalog 354 presents photomicrographs, F versus Q charts, permeability rating graphs, and the uses and applications of annealed carbonized and hydrogen reduced iron powders and magnetite. The literature is available from Magnetic Powders, Inc., 1050 Fairview Ave., Johnsonburg, Pa.

**Application of Radium**

Government approved applications of radioactive and other luminous and non-luminous materials to knobs, dials, and pointers are presented in a new brochure released by Samson Chemical & Pigment Mfg. Co., 2832 W. Lake St., Chicago, Ill.

**TUBE COST DATA**  
you've always wanted!

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Most comprehensive and accurate purchasing and cost-analysis tool in tube history! Product of over 2 years' research. Covers every tube type and crystal manufactured in U.S.—from tiniest crystal to largest transmitting tube—including...

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Tells list prices and your current costs for over 4,000 tube types! Kept up-to-date by State Labs' famous Weekly Market Guides mailed free to all owners of the Tube Buyers' Guide. In loose-leaf form, alphabetically and numerically indexed for quick, easy reference.

**PRAISED BY INDUSTRY LEADERS**

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"Without doubt your new 1953 U.S. Electronic Tube Buyers' Guide contains the most extensive tube cost information ever to hit the tube markets of this country. It's invaluable to me—I wouldn't be without it for a day."



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Note: This Tube Buyers' Guide is necessarily restricted to Purchasing Agents, Manufacturers, Industrials, Government Agencies, Distributors, Exporters. Please fill out the coupon in full and attach to your letterhead.

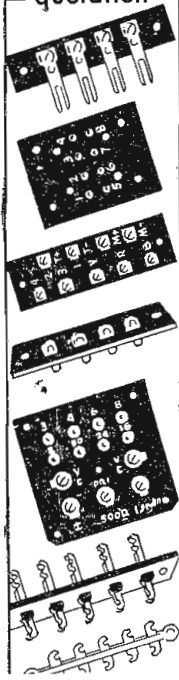
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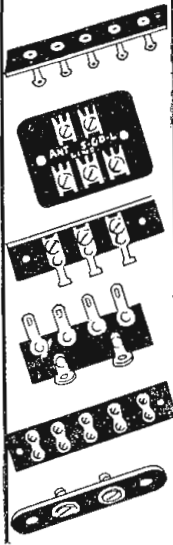
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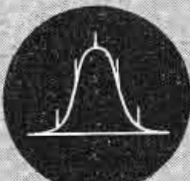
Several pages of Jones Catalog No. 18 illustrate standard and special panels we are constantly producing. Latest special equipment enables us promptly to produce practically any panel required. Send print or description for prices, without obligation. Hundreds of standard terminal strips also listed. Send for Catalog, with engineering drawings and data.

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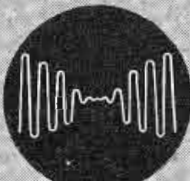


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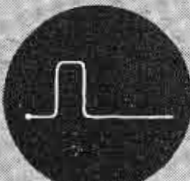
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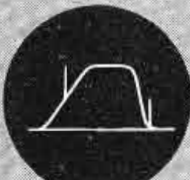
RADA-SWEEP  
Radar IF Amplifier  
Alignment



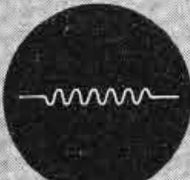
MEGA-MATCH  
Measurement of  
Reflection Coefficient



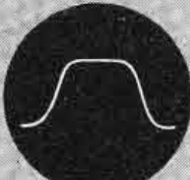
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MARKA-SWEEP RF-P  
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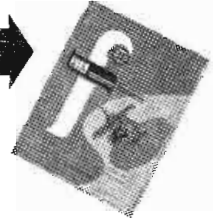


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Single Spider Gear  
Precision Differential

Available in 3/16, 1/4, 5/16 inch shaft diameters

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A zero spiral angle insures smooth motion with equal friction and thrust in either direction of rotation. Here's the *low* friction differential that's perfect for *high* sensitivity servo loops. Lost motion on pitch line does not exceed 5 minutes of arc (in the 1/4" and 3/16" models)—less than 7 minutes in the 3/16" model—exceptional accuracy. Additional design characteristics give exceedingly long life expectancy to this differential of fine FORD precision.

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**AIRCRAFT  
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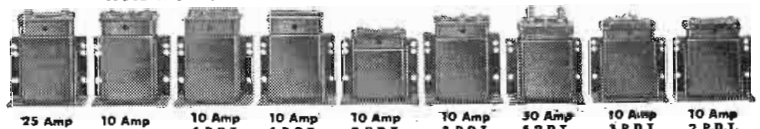


**AIRCRAFT DESIGN ENGINEERS** can allow for continuously changing power and performance requirements through the complete *interchangeability* (on the same mounting base) of this new line of Guardian Aircraft Relays. Standard spacing of mounting bracket holes provides extreme flexibility. It's the way to meet new control specifications **without changes in frame drawings!** Units range from single pole, single throw (time delay available) to four pole, double throw contact combinations, with ratings from 10 amperes to 50 amperes at 28 v., D.C. All sealed in accordance with MIL-R-6106. Weights: from 7.5 ounces to 20.8 ounces. Write for Bulletin 1 AR.



200 Ampere  
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NOTE THE PRECISE ALIGNMENT OF MOUNTING HOLES!



25 Amp 10 Amp 10 Amp 10 Amp 10 Amp 10 Amp 30 Amp 10 Amp 10 Amp  
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Standard Piezo Crystals are rugged . . . built to deliver dependable performance under extremely adverse conditions. Send for our completely illustrated catalog, or outline your own particular crystal problem. Our engineering department will be glad to assist you.

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### Antennas

Performance and engineering data covering the JeTenna conical with UHF bowtie dipole is presented in the JFD UHF antenna catalog. The 1953 Antenna Almanac is also available on request at JFD Mfg. Co., Brooklyn 4, N. Y.

### Radio-TV Tubes

A "Who's Who" of RCA electron receiving and TV tubes for AM, FM, and TV broadcasting (No. 1275-F) describes 495 receiving types, and 45 TV picture tubes and gives information to guide the selection of the most suitable tube for a specific application according to the RCA Victor Div., Radio Corp. of America.

### Coaxial Fittings Cross Index

A 22 in. x 14 in. wall chart, prepared by Coaxial Connector Co., 34 N. 2 St., Mt. Vernon, N. Y., cross indexes the government parts numbers of Army-Navy coaxial fittings with manufacturers equivalent numbers for easy reference.

### Tube Interchangeability Data

Lewis and Kaufman, Ltd., Los Gatos, Calif., gives interchangeability data on a series of "Los Gatos" electron tube types in leaflet 253.

### Tape Recording Equipment

Audio & Video Products Corp., 730 Fifth Ave., N. Y., offers a new 4-page catalog, A101, which presents detailed specs and prices on their complete line of "Ampex" 8-hour, continuous play, automatic reversal recording equipment and audio accessories.

### R-F Attenuation Filters

Catalog NB-148 can be furnished by any distributor or representative of Cornell-Dubilier Electric Corp., South Plainfield, N. J. It contains twelve pages of drawings, characteristics, and circuit diagrams covering virtually every type of electrical and electronic equipment that includes filters for radio frequency attenuation.

### Liquid-Level Control

A single-thyratron electronic liquid-level control which operates from a single capacitive probe is described in folder LL4-453 released by Thermo Instruments Co., 1160 El Camino Real, Belmont, Calif. The booklet illustrates and describes the control, probe, and alternative schematic arrangements related to the refrigeration, petroleum, chemical, and food processing fields.

### Circuit Selectors & Stepping Relays

The 30-page Ledex "Engineering Letter" presents technical data covering the rotary solenoid drive, commutating switch, end-engaging ratchets produced by G. H. Leland, Inc., Dayton, O. It also discusses switch sections, indexing speed, and finishes; and presents the mechanics of control-selective and relay stepping circuitry diagrammatically.

### Autotransformers

The "Variac" continuously adjustable autotransformer made by General Radio Corp., 275 Mass. Ave., Cambridge, Mass. which presents the advantages of the new "Duratrack" silver alloy brush-track surface is the subject of a new bulletin.

### Nickel-Iron Ribbon

Bulletin 5204, issued by Rectifier Div., I-T-E Circuit Breaker Company, Philadelphia 30, Pa., illustrates and describes the properties, production operation, and current-voltage flux value, etc., of "Peron," a binary nickel-iron alloy used in making saturable cores for toroidal winding.

### Tape-Wire Recorder Replacement Guide

The Stancor Tape-Wire Recorder Replacement Guide lists the model number, manufacturer's parts numbers, and Stancor numbers for 63 models of tape and wire recorders made by 22 manufacturers. The guide can be secured from Standard Transformer Corp., 3580 Elston Ave., Chicago 18, Ill.

**COMPACT**  
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These latest of all Carter DC to AC Converters are specially engineered for professional and commercial applications requiring a high capacity source of 60 cycle AC from a DC power supply. Operates from storage batteries, or from DC line voltage. Three "Custom" models, delivering 300, 400, or 500 watts 115 or 220 V. AC. Wide range of input voltage, 12, 24, 32, 64, 110 or 230 V. DC. Unequaled capacity for operating professional recording, sound movie equipment and large screen TV receivers. Available with or without manual frequency control feature.



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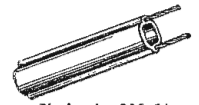
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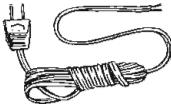
Phalon Hook-up Wire.



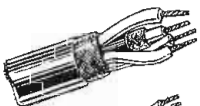
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**VERSATILE**—21-position attenuator provides level measurement from +4 to +42 and an off position.

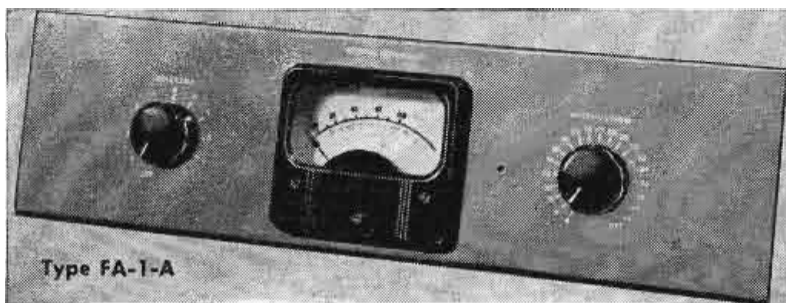
**INPUT SELECTOR SWITCH**—allows meter to be switched to ten 600-ohm program lines.

**ILLUMINATED METER**—Standard  $4\frac{1}{2}$ " meter has two scales: Upper scale—0-100 percent; Lower scale—VU from -20 to +3.

**COMPACT**—Minimum rack space required. The panel measures 19" x 5 7/32".

**LOW COST—only \$70.00\***

\*Prices subject to  
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Type FA-1-A

**AUDIO EQUIPMENT FOR AM-FM TELEVISION**

For information write: General Electric Company,  
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**GENERAL ELECTRIC**

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pack more  
performance  
into less space . . .

Rating for rating, "Diamond H" Series R hermetically sealed, miniature aircraft type 4PDT relays are smallest (1.6 cubic inches), lightest (3.76 ounces), have widest temperature range ( $-65^{\circ}$  to  $+200^{\circ}\text{C}$ .), greatest operating shock resistance (to 50 "G" and higher) and excel all others in their field in ability to break high currents and high voltages.

Ideal for high frequency switching, their inter-electrode capacitance is less than 5 micro-microfarads contacts to case, less than  $2\frac{1}{2}$  mmf between contacts, even with plug-in type relay and socket. Vibration range is from 0 to 500 cycles per second and upward at 15 "G" without chatter. Coil resistances up to 50,000 ohms are available, with contact loading through 10 A. resistive for 100,000 cycles (30 A. resistive for 100 cycles) at 30 V., D.C., or 115 V., A.C. Sensitivity approaches 100 milliwatts at 30 "G" operational shock resistance. They meet all requirements of USAF Spec. MIL-R-5757 . . . and far surpass many. Various standard mounting arrangements available. Write for Bulletin R-150 or ask for "Diamond H" technical assistance.

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Coated Hi-resolution Lenses for every TV need — wide angle, normal, telephoto —  $1\frac{1}{4}$  to 20" . . . Cooke, Zeiss, Ektra, Carl Meyer, B & L, Wollensak, Ross, Astro, etc. All accessories, baffle rings, counter-balances, fittings. Foc. mounts fit RCA, Du Mont, GE Image Orth. Special mounts for GPI and others. Expert fitting service. **LOWEST PRICES. 15 day FREE TRIAL. Unconditional Guarantee.**

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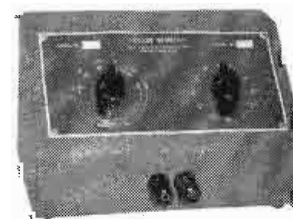
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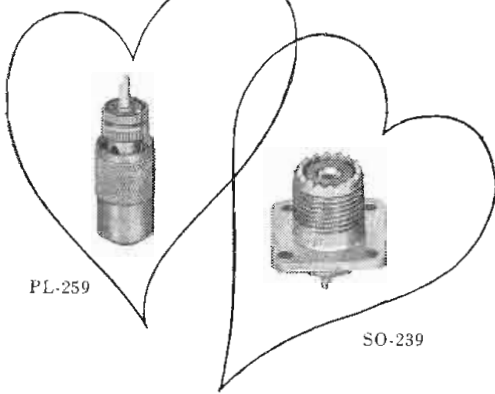
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## LOOKING FOR A Perfect Mate?



PL-259

SO-239

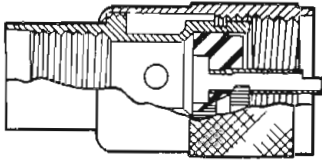
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### UHF SERIES CONNECTORS

For dependable low-cost, general purpose use. Satisfactory up to 200 megacycles and may be used with caution up to 500 megacycles.

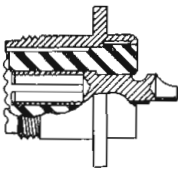


### AN Designation PL-259, PLUG (NT. 49190)

Non-weatherproof type. Mates with UHF female. Two-piece construction. For use with Cable RG-/U; 8, 9, 10, 11, 12, 13, 63, 65.

### AN Designation PL-259A, PLUG (NT. 49195)

Similar to PL-259. It is a 3-piece unit for ease of handling. Non-weatherproof. Mates with UHF female. SO239.



### AN Designation SO-239, NT. 49194 Receptacle

Mates with male plugs PL-259, PL-259A, UG-203/U. Non-weatherproof, single piece construction. For use with Cable RG-/U8, 9, 10, 11, 12, 13, 63, 65.

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CBWU-GOVERNMENT DESIGNATION

### TV Lenses

Burke and James Inc., 321 S. Wabash Ave., Chicago 4, Ill. have compiled a list of wide angle, normal angle, and telephoto lenses with focal lengths ranging from 1¼-in. through 20 in. and also a number of fittings and mountings.

### Glass-Fiber Reinforced Plastics

"Glass-Fiber Plastics," reprinted by The Dynakon Corp., 9623½ Clinton Rd., Cleveland 9, Ohio, illustrates and describes load-to-lamination directions of glass fiber plastics and fabrication methods recommended by the designing staff of North American Aviation, Inc.

### Relays and Contactors

The fully illustrated 24-page Catalog #22 released by Potter & Brumfield contains schematics of relays and contactors for nearly all electrical and electronic applications. Shown are hermetically sealed enclosures and octal, solder-terminal, and miniature plug-in connections; and up-to-date data are incorporated in easy-to-read charts.

### Indicator Lights

Dialight Corp., 58 Stewart Ave., Brooklyn 37, N. Y. have prepared a new brochure, L-153, which covers the sub-miniature indicator lights the company makes to mount in a 15/32-in. clearance hole. The units are equipped with any required midgem-flanged base T-1-¾ bulb. Literature is available on request.

### Sheet Metal Cutter

Nord International Corp., Denville, N. J., has a folder available which illustrates and describes the new "Nibblex" sheet metal cutter. This unit fits any ¼-in. electric drill, air drill, drill press, or flexible shaft that has a ¼-in. chuck.

### Regulators and Changers

A new catalog (53) available from the General Sales Dept. of Sorensen & Co., Inc., 375 Fairfield Ave., Stamford, Conn., gives complete information on the company line, and includes general and electrical specs, information on circuitry, and applications of regulators and frequency changers.

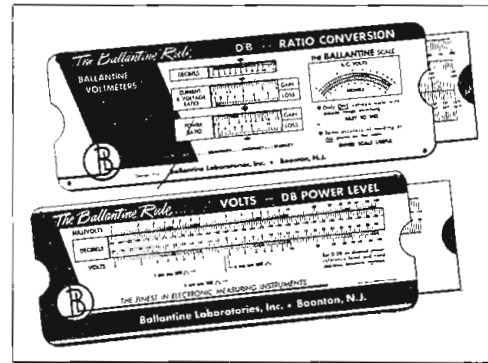
### Recording Tape Coatings

"Sound Talk", discusses the magnetic properties of "Scotch Brand" tape coatings made by Minnesota Mining and Mfg., St. Paul, Minn.

### Tuning Fork Resonator

Folder 102 presents descriptions, graphs, and schematics covering the construction, frequency accuracies, operation, and installation of the model J tuning fork resonator produced by Philamon Laboratories, Inc., 5717 Third Ave., Brooklyn 20, N. Y.

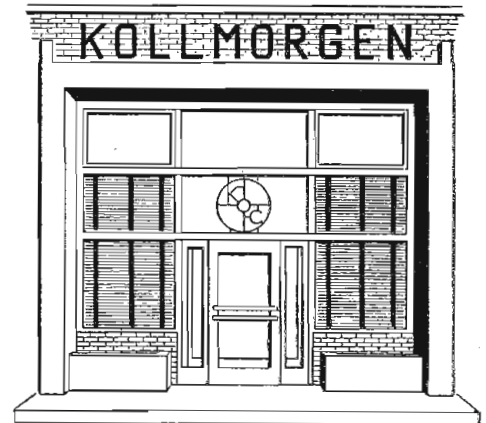
### RATIO SLIDE RULE



Ballantine Labs., Inc., Boonton, N. J., has come up with a handy slide rule for converting various values into db. On one side, loss and gain for different voltage, current and power ratios may be obtained. On the other side, db above any power reference level may be determined.

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## INDUSTRIAL PERISCOPES



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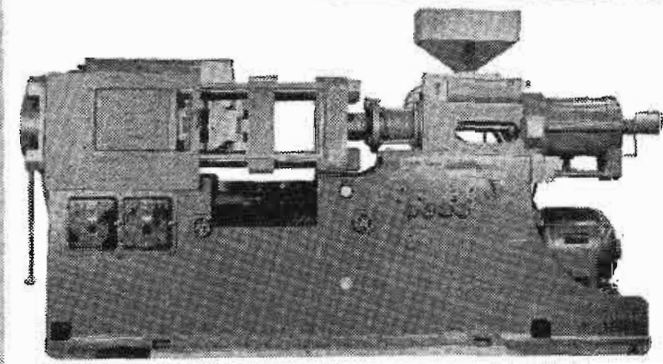
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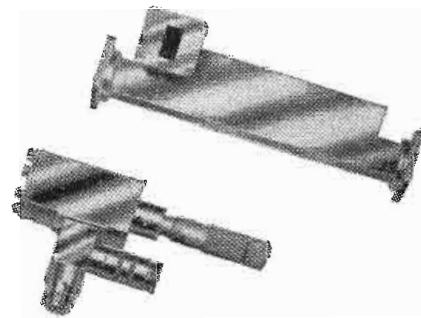
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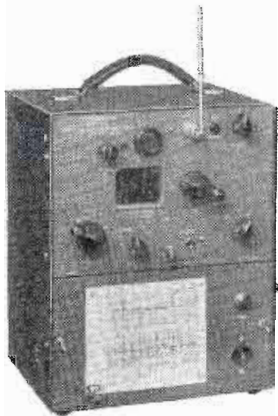
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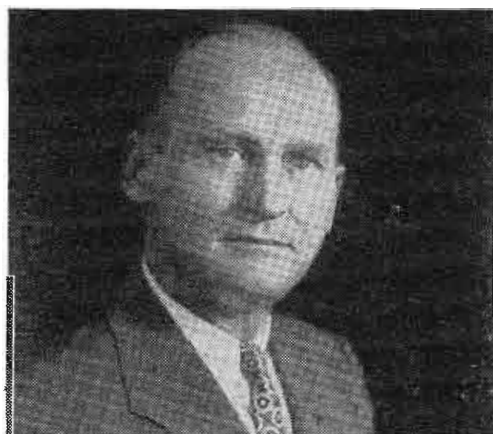
INDUSTRIAL HARDWARE Mfg. Co., Inc.  
109 PRINCE STREET • NEW YORK 12, N. Y.



Sylvania Electric Products, Inc. has announced the retirement of Max F. Balcom as chairman of the board, and the election of Don G. Mitchell, former president, to the post. H. Ward Zimmer succeeded Mr. Mitchell to the presidency. Mr. Mitchell, who joined Sylvania in 1942 as vice president in charge of sales, has been president of the organization since 1946. Mr. Zimmer joined the Pennsylvania predecessor company of Sylvania in 1919. Since 1950, he has been executive vice president in charge of operations. Mr. Balcom joined the predecessor company in 1918. He remains on the board as director and will serve in the capacity of consultant and advisor.

Raytheon Manufacturing Co., Waltham, Mass., has advanced Henry F. Argento, former assistant vice president and assistant manager of the Power Tube Div., to the vice presidency and general managership of Raytheon Television and Radio Corp., Chicago, a company subsidiary.

E. J. “Kelly” Pool, formerly vice president in charge of sales, has been made vice president and general man-



E. J. Pool

ager of Cinch Manufacturing Co., Chicago, Ill. He has been with the company for twenty-three years. Stewart Pfannstiehl has been made sales manager.

John Holzman has been named vice president and director of sales for the RCA Victor Distributing Corp. He will direct sales activities of the corporation's seven branches located in Chicago, Detroit, Buffalo and Rochester, N. Y., Kansas City, Mo., Wichita, Kans., and Davenport, Iowa. Mr. Holzman leaves the RCA Estate Appliance Corp. where he was a sales executive, to take his new position.

Temple Manufacturing Co., 1939 Bryn Mawr Ave., Chicago, Ill., has appointed Mason H. Jones executive assistant to Temple Smith, president of the organization. Mr. Jones has been with Chicago Molded Products Corp. since 1947. Previously he was assistant to the president of Webster-Chicago Corp.



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XR-13



XR-13A



XR-10A



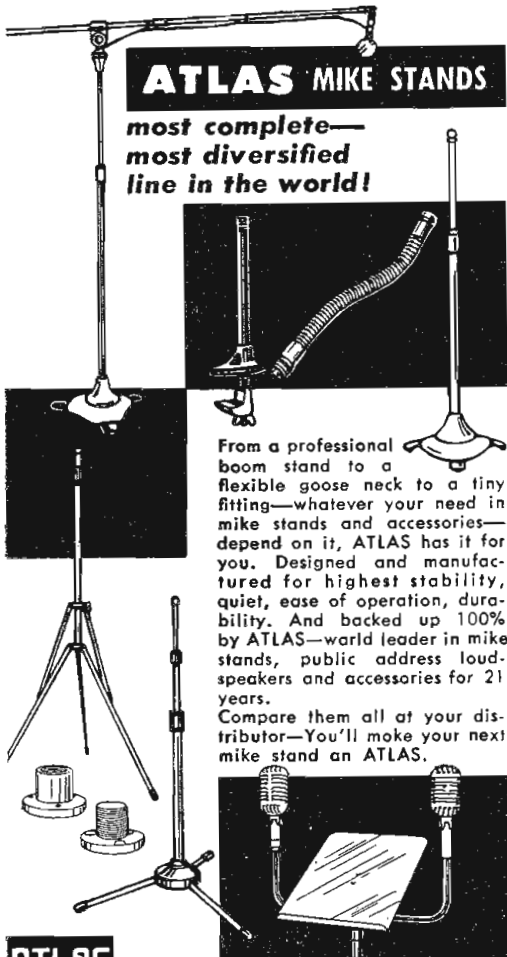
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National high-grade ceramic coil forms have been designed for a wide variety of communication and industrial applications. Types XR-13, XR-13A and XR-10A are primarily for use in transmitters, diathermy equipment, etc. The XR-60 and XR-70 series are permeability-tuned coil forms, conforming to JAN specifications. The XR-80 and XR-90 series are new small forms designed primarily for high frequency applications and also conform to JAN specifications. They are supplied with two nylon rings for separating coils wound on same form. Brass or iron cores.



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**ATLAS SOUND CORP.**  
 1445 39th Street, Brooklyn 18, New York  
 In Canada: Atlas Radio Corp., Ltd., Toronto, Ont.

Lawrence T. LaPatka, formerly manager of the sound product group of Engineering Products Division, RCA Vic-



L. T. LaPatka

tor, has been named sales manager of the research activity of the Burroughs Co., 511 N. Broad St., Philadelphia 23, Pa.

Allen B. DuMont TV Transmitter Div. recently announced a currently effective expansion program designed to give increased service to commercial, educational, and industrial users of the company's TV broadcasting equipment.

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*We now have several openings for technicians to work in the fabrication and processing of advanced type electron tube research models.*

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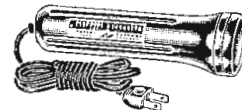
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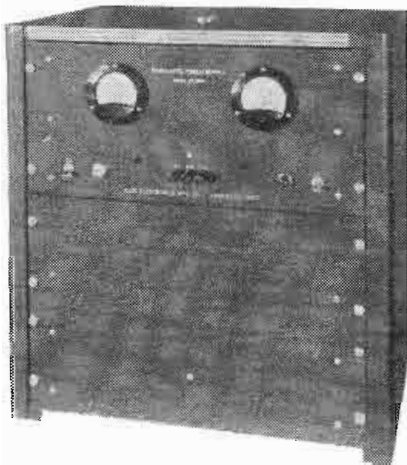
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MODEL PR-1000



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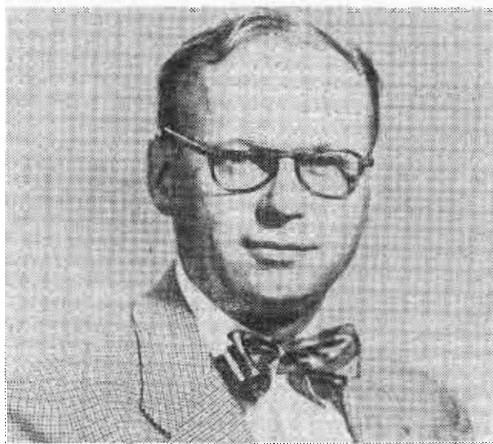
- \* REGULATED OUTPUTS:
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- \* REGULATION: Better than .03 of one percent.
- \* RIPPLE: Less than 4 millivolts.
- \* IMPEDANCE: Less than  $\frac{1}{2}$  ohm.
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B+ delayed for protection.
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- \* Short delivery dates.

**ALCO ELECTRONICS Mfg. Co.**

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Under the new plan, sales operations are conducted under the direction of four district managers under the overall supervision of James B. Tharpe, national salesmanager of the division, who will be assisted by Donald A. Stewart, newly appointed distribution manager. Lewis G. Radford, Jr., is district manager of the eastern district; Herbert Bloomberg directs the central district; and Thomas B. Mosley and Robert J. Myers direct the southern and western districts, respectively. The four national geographic sales districts are subdivided into 14 regional areas. The New York and New Jersey Puerto Rico areas and Cuba will be covered from the national headquarters, Clifton, N. J. DuMont's International Division will continue to cover areas outside the continental United States.

Leo G. Sands, who recently resigned from the presidency of Bogue Railway Equipment Division, has been appointed



Leo G. Sands

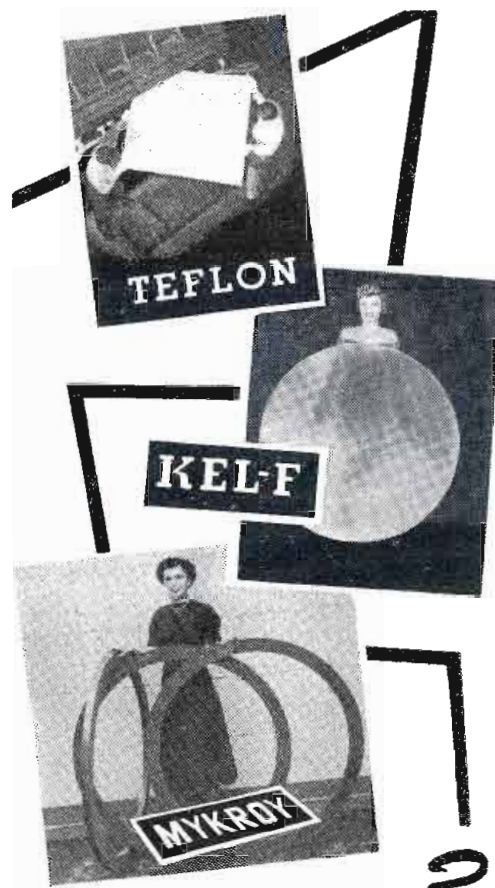
sales manager of Langevin Manufacturing Corp., and will make his headquarters at the company main office at 37 West 35th St., New York City.

JFD Manufacturing Co., Inc., has named David B. Tolins, Jr., publicity director to assist in the conduct of the company's direct mail operations and write educational articles, catalog and cooperative newspaper copy.

Burgess Battery Co., United States Battery Division, has advanced Charles E. Balz, who has been assistant sales manager for the past two years, to the position of sales-manager. He was advertising and promotion manager for ten years before he assumed his sales duties.

General Precision Laboratory Inc. has made Nathaniel M. Marshall manager of television equipment sales.

Graybar Electric Co., Inc. has appointed H. M. Bridges operating manager of the Knoxville branch of the southern district. Mr. Bridges joined the company in 1936.



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insulating materials  
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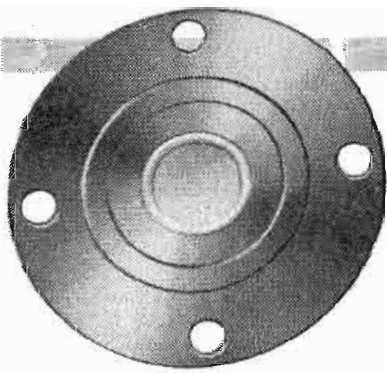
# Bomac

# MICROWAVE

## GAS SWITCHING TUBES

Bomac has available an extensive line of TR, ATR, Pre TR and attenuator tubes covering all the frequency bands and power levels in use. Many types are in high level production; specialized types can be supplied on short notice. Inquiries are invited on types not listed, or for special frequency bands. If clearance is needed, you will be advised of the appropriate government agency to contact.

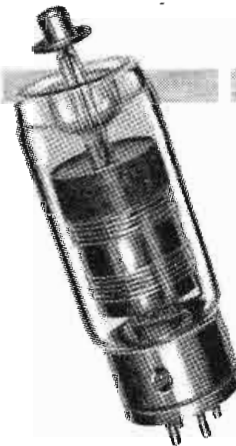
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	6000-7100	TR, Integral Cavity, Tunable	1B50



Available for all Wave Guide Sizes  
Low Q Broad Band Match  
Low Insertion Loss  
Temperature Range — 55°C to 100°C  
30 lb./sq. in. Pressure Differential  
For Choke Mounting or Soldering  
Directly to Guide

## PRESSURIZING WINDOWS

TYPE	FREQ.	DESCRIPTION
BL105	9375	P.W. RG 51/u Guide
BL106	9245	P.W. RG 52/u Guide
BL107	9310	P.W. RG 51/u Guide
BL112	9080	P.W. RG 52/u Guide
BL114	9310	P.W. RG 51/u Guide
BL116	16,100	P.W. RG 91/u Guide
BL117	9080	P.W. RG 52/u Guide
BL119	8700-8900	P.W. RG 52/u Guide
BL122	8620-9530	P.W. RG 52/u Guide
BL123	6500	P.W. RG 51/u Guide



Bomac Hydrogen Thyratrons are designed primarily for use as a switch tube in line type modulators for pulsing magnetrons in radar equipment. However, it has also found many applications in laboratory, production and test equipment where precise triggering at high power levels is required.

## HYDROGEN THYRATRONS

TYPE	Peak Anode Voltage KV Max.	Peak Anode Current Amps Max.	Average Anode Current MA Max.	Peak Trigger Voltage Volts Min.
3C45	3.0	35	45	175
4C35	8.0	90	100	175
5C22	16.0	325	200	200
VC1258	1.0	20	50	130
6130	3.0	35	45	175 High Altitude
5959/E41	8.0	35	45	130
5957/E37	8.0	90	100	175 Wafer Base
HT415	16.0	325	200	200 Low Jitter

SPARK GAP MODULATORS

1B41  
1B45