RADIO AND TELEVISION

Service News

A PUBLICATION OF RCA ELECTRONIC COMPONENTS AND DEVICES

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NATESA Honors RCA for Aid to Independent Service Technicians

Plaudits from the National Alliance of Television & Electronic Service Associations recently honored two major marketing segments of the Radio Corporation of America.

The "Friends of Service" award – NATESA's foremost recognition of assistance and cooperation rendered independent service technicians – was presented to the Distributor Products organization of RCA Electronic Components and Devices and to the RCA Victor Home Instruments Division.

The awards were accepted in behalf of the respective activities by H. F. Bersche, Division Vice President, Distributor Products, and R. W. Saxon, Vice President and General Manager, RCA Victor Home Instruments Division. Mr. Saxon, also Vice Chairman of the RCA Sales Corporation, recently was elected a Vice President of the Radio Corporation of America.

"The Friends of Service Management Award for 1964" follows by two years a similar award to the RCA Electron Tube Division – predecessor organization of RCA Electronic Components and Devices. The 1962 award was made by the Directors of NATESA during their national convention, and lauded RCA "for outstanding service in creating better customer relations." The 1964 award likewise acclaims RCA for its outstanding job, and vividly exemplifies the close ties between RCA and the various service associations and their memberships.

R. W. Saxon, left, Vice President and General Manager, RCA Victor Home Instruments Division, receives the National Alliance of Television & Electronic Service Associations' "Friends of Service" plaque from Larry Dorst, President of NATESA.

NATESA award is accepted for the Distributor Products organization of RCA Electronic Components and Devices by H. F. Bersche, right, Division Vice President, Distributor Products. Making the presentation at left is Tom Hudson, Secretary-General, NATESA. The "National Alliance of Television & Electronic Service Associations" is composed of service technicians of home-entertainment and other electronic equipment. The "Friends of Service" award recognizes the manufacturer who has performed an outstanding job in assisting the independent service technician during a particular year.

RADIO AND TELEVISION
Service News

A PUBLICATION OF RCA ELECTRONIC COMPONENTS AND DEVICES

RCA RADIO & TELEVISION SERVICE NEWS is published in the interest of dealers and service technicians. It is written to assist them in providing better service, and to foster the growth of their business by supplying them with information on the latest troubleshooting and sales promotion techniques, sales and service aids, together with invaluable data on RCA tubes, transistors, batteries, and electronic instruments.

FALL
1965

RCA RADIO & TELEVISION SERVICE NEWS is a quarterly publication of RCA Electronic Components and Devices, Harrison, New Jersey.

Vol. 30, No. 3

New RCA Floor Merchandiser Helps Dealers Reap Gains Of Peak Christmas Demand for 'D'-Cell Toy Batteries

Ready to try for your share of the big Christmas market in flashlight batteries?

Vastly increased popularity and demand for battery-operated toys during the yuletide season offer you tremendous sales possibilities in popular "D"-cell types. It's estimated that 40% of all flashlight battery sales are made during the Christmas period alone. These are profit opportunities you can't afford to ignore.

Now – with a colorful and attractively designed floor merchandiser newly announced by RCA and available through your authorized RCA battery distributor – you can take advantage of this peak selling season (with less inconvenience and expense than ever before).

The RCA Flashlight Battery Floor Display (1P1209) has been specifically designed to produce maximum impulse appeal at the point of purchase. Its three bright, sharply contrasted colors; modern, attractive lines; and central location make it a focal point for the eyes of every customer in your store. Although only 18 inches wide, 13 inches deep, and 47 inches high, this compact, self-service, bin-type display can hold a full case of RCA VS036 single "D" cells or VS036 double-power packs.

Why not get in touch with your local RCA battery distributor today to get your RCA Flashlight Battery Floor Display. Remember, it can point the way to peak selling-season profits in flashlight batteries by making them accessible, conspicuous, and priced for rapid, volume movement.

RCA Flashlight Battery Floor Display (1P1209) measures only 18 inches in width, 13 inches in depth, and 47 inches in height. This attractively designed, multi-colored merchandiser holds a full case of flashlight batteries.

'Bagful of Batteries' Ideal Way to Increase Home Service Calls Around the Holidays

Looking for new ideas to boost your radio/TV/hi-fi servicing business during the holiday season?

What better way than by offering a free "Bagful of Batteries" with every home service call!

Today's average family uses more batteries than ever before, and applications for "D"-cell flashlight-battery types are mounting daily. You can apply this expanding demand to your advantage by coming up with an incentive offer featuring the RCA brand in the popular, multi-purpose tote bag. This durable, polyethylene bag can hold up to a dozen of the RCA VS036 "D" cells and other RCA battery types widely employed in battery-operated toys and appliances.

Here is also an excellent way to acquaint your customers with the fact that your store is a local headquarters for RCA batteries – a famous-quality brand backed by national advertising, including TV commercials on the renowned Sunday evening show, Walt Disney's "Wonderful World of Color." Now's the time to contact your RCA battery distributor and gear up for the forthcoming peak selling season in batteries.

Special Offer of Color-TV Servicing Equipment to Dealers Ends on December 15th

Color-TV Test Picture Tube Available Free With Every Purchase of RCA's Popular WR-64B Color Bar Generator

Gaining a solid foothold in the vital new field of color-television servicing?

One of the best ways to assure your success and growth in this potentially vast business area is by capitalizing on know-how and equipment provided by RCA — pioneer in compatible color television.

RCA and your authorized RCA test equipment distributor — ever mindful of your need for reliable, up-to-the-minute technical data and servicing instruments — announce a spectacular offer that can mean big savings to you.

From now through December 15, 1965 — with every purchase of an RCA WR-64B Color Bar/Dot/Crosshatch Generator — you get a *free* color-TV "test" picture tube for use in your color-TV test jig.

The RCA WR-64B Color Bar/Dot/Crosshatch Generator incorporates all the advances made in several years of laboratory development and field testing, and can be used for adjusting linearity and overscan in black-and-white TV receivers as well as for numerous applications in color-TV servicing. As an aid to convergence adjustment, switches are provided for shorting out the red, blue, or green guns of the color picture tube.

The advantages of the color-TV test jig already are well known among most technicians. Not only is this cabinet-picture tube-yoke combination indispensable in troubleshooting circuits, but can save many hours of service-call time. With it you need remove only the receiver chassis, rather than the entire receiver — cabinet and picture tube. This means all-around improved scheduling and distribution of daily work load.

But RCA's free-tube offer has still another benefit: the removal of a formidable expense item that will leave you with "found" money for other business needs. The procedure is simple, and here's all you have to do:

Simply go to your local authorized RCA test equipment distributor between now and December 15, 1965, and buy an RCA WR-64B Color Bar/Dot/Crosshatch Generator. Fill out your warranty registration card; remove the red identification label from the WR-64B carton; and mail them both to RCA Test Equipment Headquarters, Building 23-2, Harrison, N. J., before December 31, 1965. RCA will send you the tube either from Lancaster, Pa., or Marion, Ind., freight charges collect.

The free picture tube you receive for use in your color-TV test jig is a 21-inch, 70° round, color-TV test type —electrically guaranteed for six months from first installation date. These picture tubes will have minor mechanical (not electrical) defects. They're not quite good enough to go into a new TV set but perfectly adequate for testing purposes.

The WR-64B Color Bar/Dot/Crosshatch Generator which you purchase has been called the technician's "*essential* color-TV test instrument." Available at an Optional Distributor Resale price of $189.50, this new color bar generator succeeds the earlier WR-64A and features a unique crystal-controlled RF oscillator circuit and separate red, blue, and green gun-killer switches.

The crystal-controlled RF oscillator circuit assures the user that the fre-

(Continued on next page)

RCA's 'Hi-Lite' Line of All-New, Rare-Earth Phosphor Picture Tubes Offers Unsurpassed Picture Brightness and Natural Color Reproduction

Ready for the replacement business in color-television picture tubes?

RCA and your authorized RCA picture tube distributor now offer you the unprecedented support of "Hi-Lite"— a complete line of all-new, rare-earth phosphor color-television picture tubes bringing new horizons in enjoyment to set owners.

RCA Hi-Lite tubes are the result of years of research in new types of phosphors and screening processes to improve picture brightness and color reproduction. The recently announced tubes utilize advanced green and blue sulfide phosphors plus a "rare-earth" red phosphor which are applied by a unique slurry screening process developed by the company.

All color television picture tubes produced by RCA for set manufacturers now contain the improved phosphors. In addition, the new "Hi-Lite" brand is available to service-dealers through authorized RCA picture tube distributors. Initially, three types are being offered through distributors. They are: the popular 21-inch, 70° round color tube, 21FBP22A; 21-inch, 70° round color tube, 21FJP22A (integral-protective window type); and the 25-inch, 90° rectangular tube, 25AP22A (integral-protective window type). A 19-inch, 90° rectangular tube will be added to the distributor line shortly.

The new color-TV picture tubes are packaged in attractive cartons which prominently display the new RCA "Hi-Lite" brand name. Round and rectangular tube types are identified on the cartons not only by type number but by a round or rectangular dot pattern appearing in the square opposite the RCA logotype.

"Hi-Lite" picture tubes not only provide improved picture brightness and more natural color but sharpen the clarity of black-and-white television reception as well. Now's the time to get ready for the growing replacement market in color picture tubes by inco ra g 's new line in your inventories of popular, fast-moving RCA tube s.

quency of the WR-64B signal is the same as the frequency of the signal broadcast by the TV station. It further assures the user of stability and permanence of the picture carrier signal.

The separate red, blue, and green gun-killer switches greatly simplify convergence adjustments and color purity testing. Using specially designed lead-piercing clips, the technician can "kill" one or any combination of the three guns.

In addition, the WR-64B has several other features necessary for professional color-TV servicing work that most competitive generators do not offer, such as:

- À sound ca er (essential to accurate alig ent proc ures).
- Three stal ntrolled os lator circuits (for improv stability).
- Specially designed color subcarrier circuit to provide an extremely stable, high-accuracy signal.
- The capability of making color phasing adjustments right in the home without a 'scope, simply by observing the patterns on the screen of the picture tube.

All of these features combined go to make the WR-64B the finest color bar/dot/crosshatch generator available today at any price! You owe it to yourself to check over the many advantages of this RCA test instrument, and discover how these advantages can result in important gains to you. And combined with the free-tube offer, you can't afford to pass up this unusual opportunity to make new headway in the field of color- servicing. Contact your local authorized RCA test uipment distributor today for the complete details.

'SK-Series' Expanded to Thirteen Transistors and Two Rectifiers

'Top-of-the-Line' Transistors Now Meet Over 2,700 Replacement Needs in Entertainment-Type Equipment

Recent addition of the SK-3013, SK-3014, and SK-3015 transistors to RCA's popular "Top-of-the-Line" series provides you with a total of 13 outstanding transistors that can fill over 2,700 replacement needs in entertainment-type equipment.

With the SK-Series transistors, you now also have available two recently added SK-Series silicon rectifiers – the SK-3016 and SK-3017 – which enable you to replace virtually any selenium- or silicon-rectifier types having comparable ratings and used in entertainment-type electronic equipment.

These latest boons to more efficient servicing and simplified inventories – both big potential money-savers – are accompanied by accurate, comprehensive, and up-to-date replacement information contained in the new, 16-page, RCA "Top-of-the-Line" Semiconductor Replacement Guide" (SPG-202). With this Guide, you have at your fingertips the information on more than 2,700 transistor types, including many of foreign manufacture, which the 13 RCA "Top-of-the-Line" types replace. If you haven't already received a copy of the Guide through the mails, be sure to ask your RCA distributor to send you one. Constant up-dating of the information will assure you of new replacement data as soon as it becomes available.

Here is your current listing of RCA "Top-of-the-Line" transistors and rectifiers which can provide the answer to many of the replacement problems you daily face in servicing auto radios, battery-operated portable radios, tape recorders, hi-fi equipment, phonographs, black-and-white and color-TV, and other entertainment-type equipment using solid-state devices:

- **SK-3003.** PNP type, AF Driver and Output Stages (9 volt supply).
- **SK-3004.** PNP type, AF Driver and Output Stages (15 volt supply).
- **SK-3005.** PNP type, RF, IF, and Converter Stages of Broadcast Receivers.
- **SK-3006.** PNP type, RF, IF, and Converter Stages of FM and AM/FM Receivers.
- **SK-3007.** PNP type, RF, IF, and Converter Stages of All-Wave Receivers.
- **SK-3008.** PNP type, RF, IF, and Converter Stages of Auto Radios.
- **SK-3009.** PNP type, Audio Output Stages of Auto Radios.
- **SK-3010.** NPN type, AF Driver and Output Stages of Broadcast Receivers.
- **SK-3011.** NPN type, RF, IF, and Converter Stages of Broadcast Receivers.
- **SK-3012.** PNP type, Audio Output Stages of Auto Radios.
- **SK-3013.** Matched pair of SK-3009 for push-pull stages.
- **SK-3014.** Drift-Field type for Output and Driver Stages of Hi-Fi equipment.
- **SK-3015.** Matched pair of SK-3014 for push-pull stages.
- **SK-3016.** Silicon Rectifier for color, black-and-white TV, Radios, Phonographs.
- **SK-3017.** Silicon Rectifier for color, black-and-white TV, Radios, Phonographs.

The SK-3016 is a popular flange-type (DO-1) silicon rectifier while the SK-3017 is an insulated TO-1 type.

The three recently added transistor types are intended to meet your increased servicing needs in the fast-growing, solid-state stereo market.

Matched Pairs of Transistors

When one transistor in a push-pull power-amplifier stage becomes inoperative, the resulting circuit imbalance may produce very large changes in the operating conditions for the stage. These changes will depend on the cause and nature of the failure, and may cause damage to associated circuit components, including the other transistor or transistors in the stage. It is advisable, therefore, to replace both or all transistors in a push-pull power-amplifier stage when one or more of the transistors becomes inoperative.

When both (or all) transistors in a push-pull power-amplifier stage require replacement, it is generally advisable to replace them with a matched pair or pairs such as the RCA SK-3013 or the RCA SK-3015, even though the service data for the equipment does not specifically indicate that a matched pair or pairs should be used. In such cases, the use of a matched pair or pairs will simplify balancing adjustments, and will help maintain the original performance quality of the equipment.

Industry's Most Comprehensive Top Quality Replacement Semiconductor Line

Why not contact your RCA semiconductor distributor today? Ask him for the details on how you can stock the complete SK-Series – 13 transistors and 2 rectifiers – as soon as possible. Remember, each transistor and rectifier in the SK-Series is designed to provide outstanding performance in a specific application or type of service, and can replace a wide variety of transistors and rectifier types used in that application or type of service in original equipment.

One of the surest ways for you to avoid costly delays in the servicing of auto radios and other entertainment-type electronic equipment is to have the right transistor- and rectifier-replacement type on hand when you need it. With RCA's 15 "Top-of-the-Line" solid-state devices, you can take your biggest, most important, step in that direction.

RCA Announces All-Transistor, Citizens'-Band 2-Way Radio

RCA and your authorized RCA citizens'-band radio distributor now bring you the "Mark 10" — a *fully transistorized* 2-way radio representing new heights of achievement in C-B performance, versatility, and convenience.

Featuring low current drain and compact, lightweight design, this latest equipment in a long line of quality 2-way radios from RCA is particularly useful for installation in automobiles, service trucks, and other vehicles. Effective range of the *Mark 10* varies from several miles to roughly 30 miles —depending upon terrain, atmospheric conditions, and intervening obstructions. Because the transceiver incorporates a circuit utilizing only high-capability silicon transi rs, dependable perfo ance is assured at oper-a g temperatures ranging from −23 degr to +130 degrees Fahrenheit.

One of many outstanding features of the *Mark 10* is mplete provision for 3-watt public-address use, with volume level fully controllable by the receiver volume control. T P-A switch is locat on the front panel and an ext al speaker jack de- tivates the internal speaker.

The *Mark 10* may be connected to a standard 12-volt DC wer source th either a positive or negative gro d. A separate, voltage-re lated tr sistorized AC power supply th built-in a liary speaker is av able for connection to a 120-volt AC, 60-cycle power source.

e transceiver has an ill inated a el selector with provision for 12 crystal-co olled tr s t-and-receive channels. It comes equipped with trans t-a -receive stals for Channel 9. A tuneable receive acc ory is available for reception of all 23 els.

For your added nvenien , the *Mark 10* o f tures an ill inated combination " ' meter and relative output meter. This provides you with indication of the relative strength of the incoming si al "S") d the level of the RF si al your t is smi g, thus giving an immediate visual check on the tr sceiver's operation.

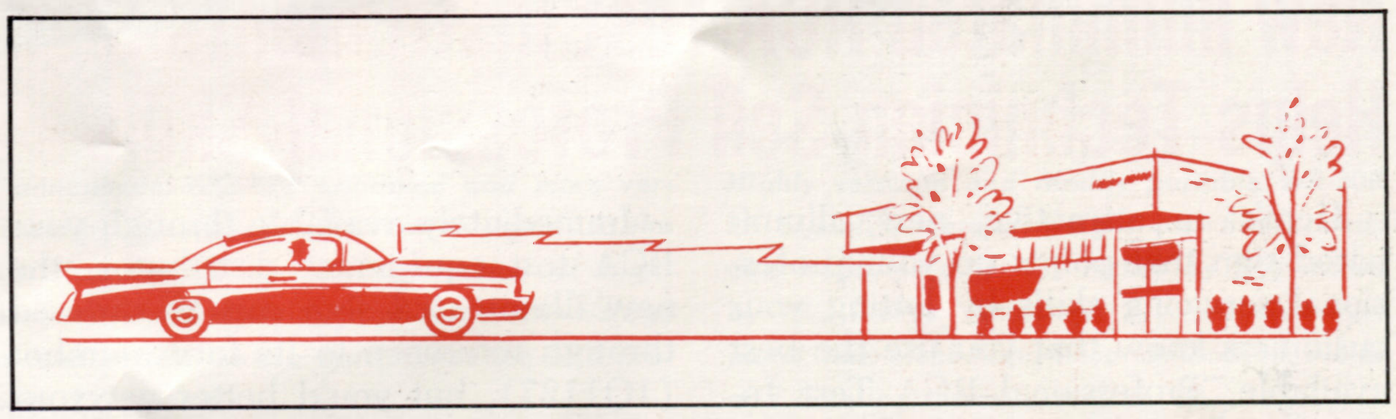
gin ed to meet RCA's dition-ally high standards of excellence, the *Mark 10* incorporates a separate AGC amp er to e ate blas g d overloading, and to minimize fading. Maximum selectivity without ringing is achieved by use of a 6-stage tuned IF bandpass filter. Noise-limiting capability is enhanced through a low-distortion, automatic series-type noise limiter.

Receiver design incorporates a crystal-controlled double heterodyne system of frequency control of the type used in commercial high-frequency communications equipment, thus achieving frequency accuracies greater than 0.004%. In addition, the receiver power section is regulated with a zener diode for maximum stability.

The instrument's rugged metal cabinet is acoustically designed with audio characteristics shaped for maxim intelligibility. Compact and lightw ht, *Mark 10* is only 3⅜ inches high, 5¾ in es ep, 8½ inches wide, and weighs less than 4½ pounds.

Now available through your authorized RCA citizens'-band radio distributor at an Optional Distributor Resale price of $189.95, the *Mark 10* comes complete with a press-to-talk microphone with coiled cord, a power cord, and a trunnion-type mounting bracket. A pair of transmit-and-receive crystals for Channel 9, an instruction manual, and a copy of the FCC license application form are also included, together with an attractive decal that can be placed on your auto or service vehicle.

Small, precise, dependable and uncomplicated, the RCA *Mark 10* can provide practical, economical answers to your business and recreational communications needs. Take adv tage of s latest advance in RCA citizens'-band pability by ge g the f par-ticulars today.



RCA's new, fully transistorized "Mark 10" 2-way radio offers the service-dealer and radio/TV/hi-fi technician a practical, economical solution to the short-range communications needs of his business. One of many out nding features of this sturdy C-B unit is its low power drain.

John B. Farese Named to Head Electronic Components And Devices; Douglas Y. Smith in New Corporate Post

Promotion of John B. Farese to Division Vice President, Electronic Components and Devices, Radio Corporation of America, was announced recently by W. Walter Watts, RCA Group Executive Vice President.

Mr. Farese, who has been in charge of all RCA color and black-and-white television picture tube production as Division Vice President and General Manager, Television Picture Tube Division, succeeds Douglas Y. Smith. Mr. Smith, a Vice President of RCA, will move to the RCA executive offices in New York for special assignments on Mr. Watts' staff.

As head of all RCA electron tube and semiconductor operations, Mr. Farese will continue to direct the company's color television picture tube production. RCA recently announced a $37 million expansion program that will double color picture tube output during the next three years at its plants in Marion, Ind., and Lancaster, Pa.

In his announcement, Mr. Watts emphasized Mr. Farese's "outstanding performance" in managing RCA's television picture tube production facilities over the past several years, during a period of "explosive growth" in color.

He said at the same time that Mr. Smith in his new staff position will provide RCA at the corporate level with "unparalleled depth and range of experience for the exploration and development of new opportunities in the fields of electronic components and tube and semiconductor devices."

Mr. Farese joined RCA in 1930 as office manager of accounting for engineering activities, RCA Electron Tube Division, at Harrison, N. J. In 1935 he was made supervisor of general accounting, and two years later was advanced to Plant Accountant. He was appointed assistant to the Controller of the division in 1947.

John B. Farese

In 1953, Mr. Farese was promoted to Manufacturing Manager, Receiving Tube Operations Department, and three years later was named Manager of Personnel. He became Manager, Entertainment Tube Products Department, in 1957, and was promoted in 1960 to the position of Division Vice President, Entertainment Tube Products Department. He was named Division Vice President and General Manager, RCA Television Picture Tube Division, in 1963.

Mr. Smith also has been with RCA since 1930, when he joined the company's tube engineering activities at Harrison. He rose through a series of engineering and marketing positions of increasing responsibility, becoming Merchandise Manager for the RCA Tube Department in 1944, and subsequently Manager of the RCA tube plant at Lancaster, Pa. He was named Vice President and General Manager, RCA Electron Tube Division, in 1954, and was appointed Vice President, RCA Electronic Components and Devices, in 1963.

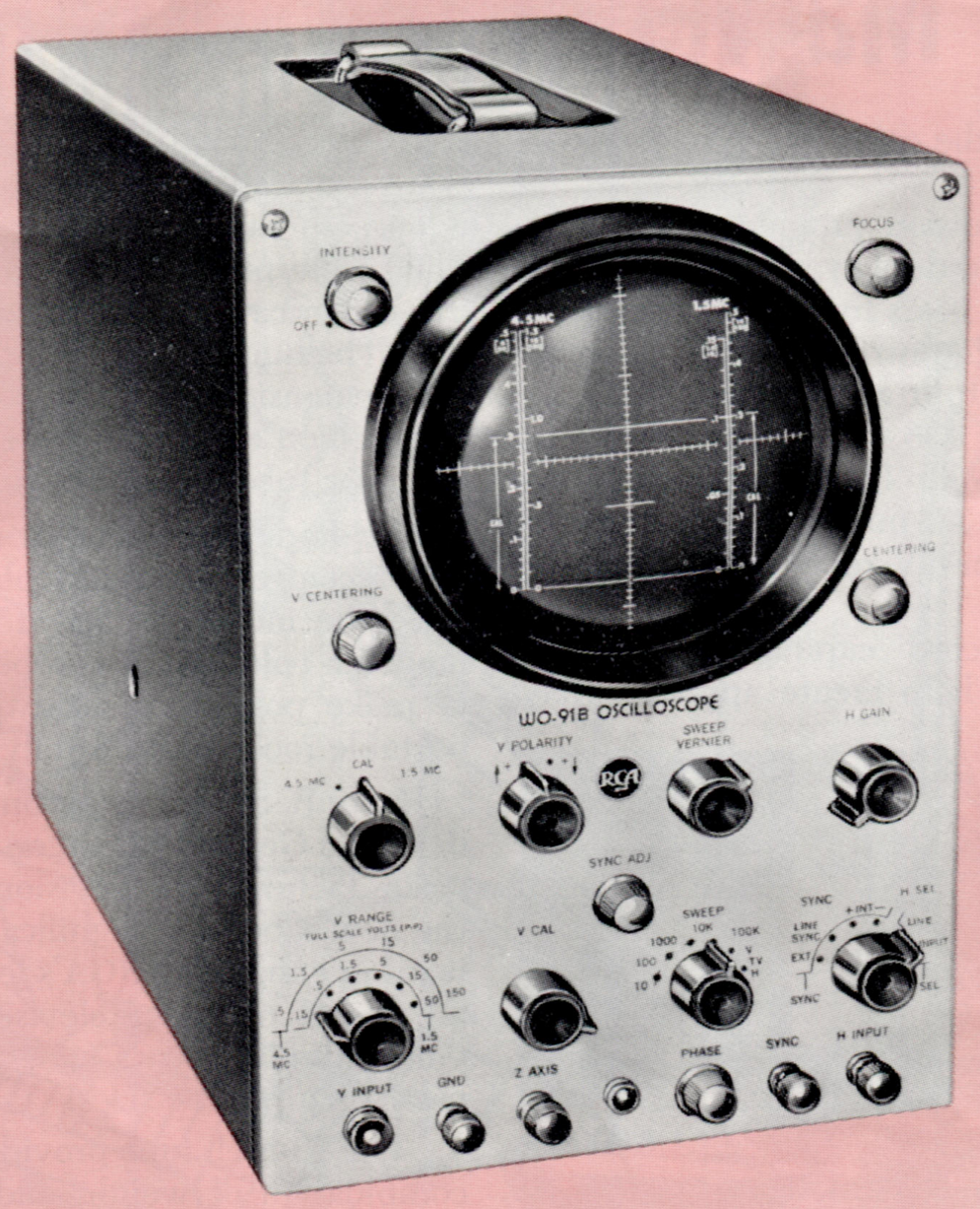
New Illuminated RCA Test Instruments Sign Helps Technician Sell Professional Skills

Here's an attractive, new, illuminated sign that points up your professional servicing skills by letting your customers know that you use the best available "Professional RCA Test Instruments" in the repair and maintenance of their radio, TV, and hi-fi equipment.

Of sturdy, metal construction with a plastic face, this smartly designed attention-getter measures 16 inches by 7¾ inches by 5¼ inches — an ideal size for either permanent display in your store window or as a night light inside the shop.

Immediately available through your RCA test equipment distributor, the new illuminated sign can be ordered through reference to its form number (1Q1127), but you'd better get your order in quickly as the supply is limited. With color-TV interest mounting daily, now's the time to remind your customers that you can serve them *better* because your service establishment is equipped with the finest precision electronic instruments obtainable. See your distributor today, and find out how you can best fit in the new sign to your individual needs.

WO-91B 5-Inch Dual-Band Oscilloscope



SIMPLIFIES TECHNICIAN'S JOB. *RCA's recently announced WO-91B improved and more versatile 'scope highlights a "direct-drive" feature providing for direct connection of signals to the vertical-deflection plates of the cathode-ray tube. This feature permits observation of high-frequency RF waveforms, such as trapezoidal and wave-envelope modulation patterns. A two-stage sync separator simplifies checking of TV horizontal and vertical sweep synchronization and provides exceptionally solid lock-in action on composite TV signals.*

Highly versatile and readily portable WR-50B RF Signal Generator weighs just five pounds and measures only 4¾ inches by 5⅜ inches by 7¾ inches. Attractive, brushed aluminum panel has etched-and-filled calibration scales and lettering that will not rub off.

Newest Version of RCA's RF Signal Generator Features Output for Sweep Alignment of AM and FM IF Circuits

Ready for another big forward step in radio-TV alignment and servicing capability?

RCA offers you an easy way to accomplish this through its latest-model RF Signal Generator, an all-purpose instrument that highlights sweep output at 455 Kc/s and 10.7 Mc/s for sweep alignment of both AM and FM IF circuits.

The newly announced WR-50B features a sweep-output circuit which makes it possible to obtain a continuous oscilloscope display of IF bandpass characteristics. A return-trace blanking circuit is included to provide a zero-reference line.

The Generator also produces tunable RF output from 85 Kc/s to 40 Mc/s, and 400 c/s audio output. A crystal-controlled oscillator is provided for use with an external crystal.

The variable oscillator covers the fundamental frequencies from 85 Kc/s to 40 Mc/s in six ranges. For higher frequencies, harmonic of the high range can be used.

A vernier tuning control permits precise setting of the output frequency. The RF output can be modulated with the internal 400-c/s oscillator, or with an external audio signal. The modulation level is adjustable.

A two-position attenuator switch, together with a variable attenuator control, provides complete adjustment of the RF output level.

The crystal-oscillator circuit in the WR-50B enables the instrument to be used as a crystal calibrator. A convenient crystal socket is provided on the panel. This crystal oscillator can be used as a frequency calibration reference for the variable oscillator, or can be used directly as a crystal-controlled signal source.

Available through your authorized RCA test equipment distributor at an Optional Distributor Resale price of $65.00, the new RF Signal Generator includes a shielded RF output cable to minimize radiation and hum pickup. A phono-type panel jack is provided for AF input/output.

See your distributor for complete WR-50B performance data and other information you may desire.

RCA Strives to Keep Pace With 'Explosive Public Demand'

Color TV: Industrial Marvel of the '60s

The largest single expansion program in RCA's 46-year history – a $50 million outlay to double color-TV receiver and picture-tube output – is the company's spirited response to an "explosive increase in consumer demand which has made color television the fastest growing industry in the world today."

Announcement of the record expenditure came from W. Walter Watts, RCA Group Executive Vice President, who said that "the new facilities will further strengthen RCA's leadership position in the color television receiver industry."

The expansion program, he added, is already underway, and is designed to reach its goals for color-TV set production within two years, and for color-TV tube output within three years.

A total of $36.4 million will be spent to expand color-TV picture tube facilities, and $13.3 million will be used to expand color-TV receiver facilities, he reported.

"This record capital expenditure, which will help create approximately 2,000 new jobs at RCA's color-TV plants, is further evidence of our confidence in the strength and continuation of the present dynamic growth of the American economy," Mr. Watts said. The huge planned outlay for color tube expansion will bring to more than $65 million the amount spent by RCA for color tube expansion since 1962.

New 25-inch, 90-degree, rectangular color picture tubes are examined by inspector at RCA's Lancaster, Pa., plant. Conversion of facilities for manufacturing all 25-, 21-, and 19-inch color tubes with the improved phosphors have now been completed at the Lancaster and Marion, Ind., plants. Every RCA color tube now produced for the OEM market will employ the latest developments in picture brightness and color reproduction. Marketed under the company's new "Hi-Lite" brand name, these brighter tubes are also available through authorized RCA picture tube distributors, and are being stocked by progressive service-dealers who are ready for the replacement color picture tube business.

The Radio Corporation of America also recently announced plans to produce the industry's first 15-inch, rectangular color picture tube, designed to make possible a lightweight color portable receiver for family viewing.

Harry R. Seelen, Division Vice President and General Manager, RCA Television Picture Tube Division, described the new tube as a "significant step forward in enhancing RCA's leadership in all phases of color television by providing the industry's widest variety of color picture tube sizes.

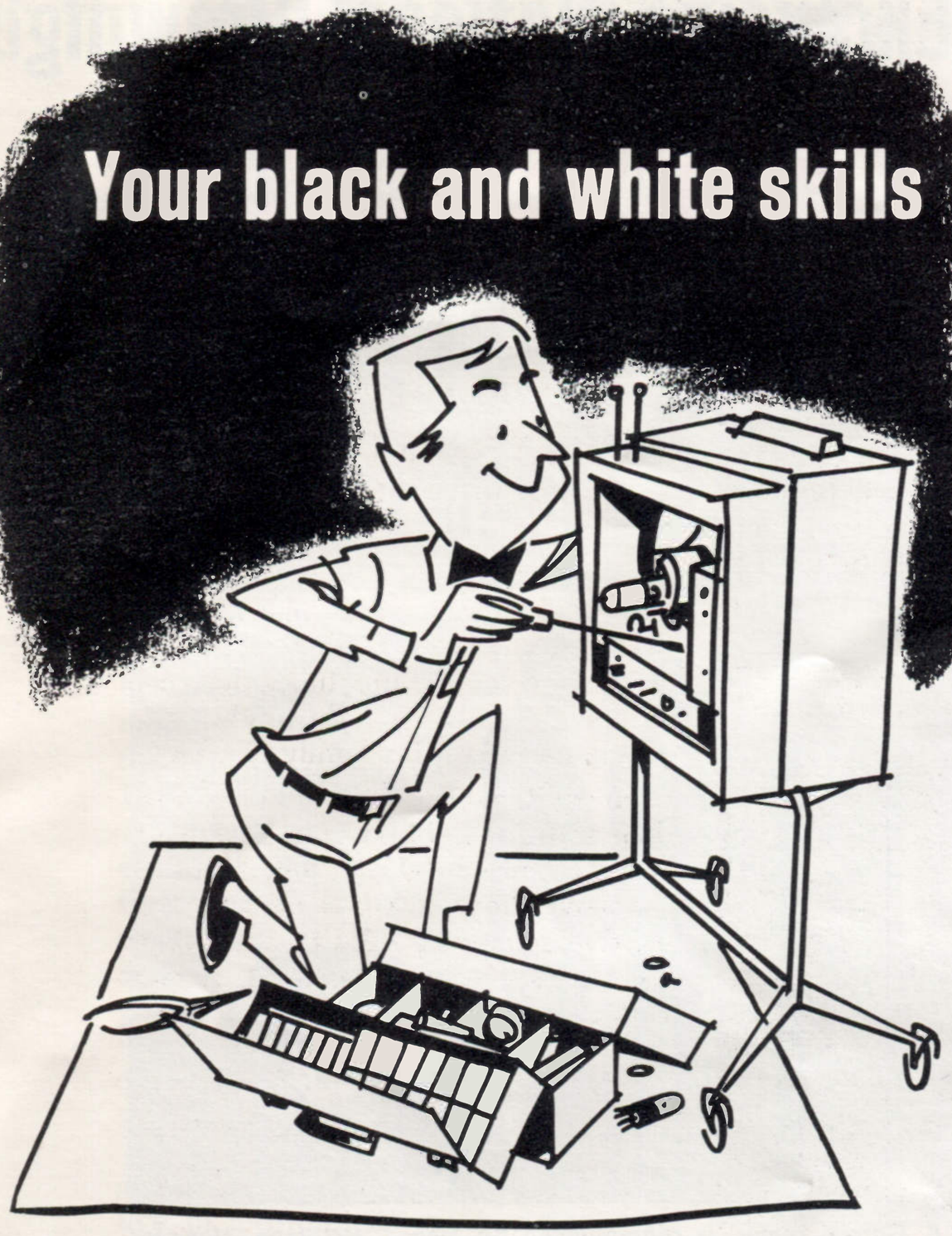
"The 15-inch tube provides the ideal combination of weight and size for a truly portable color set that can be carried around the house but still has a large enough screen for comfortable group viewing," Mr. Seelen said.

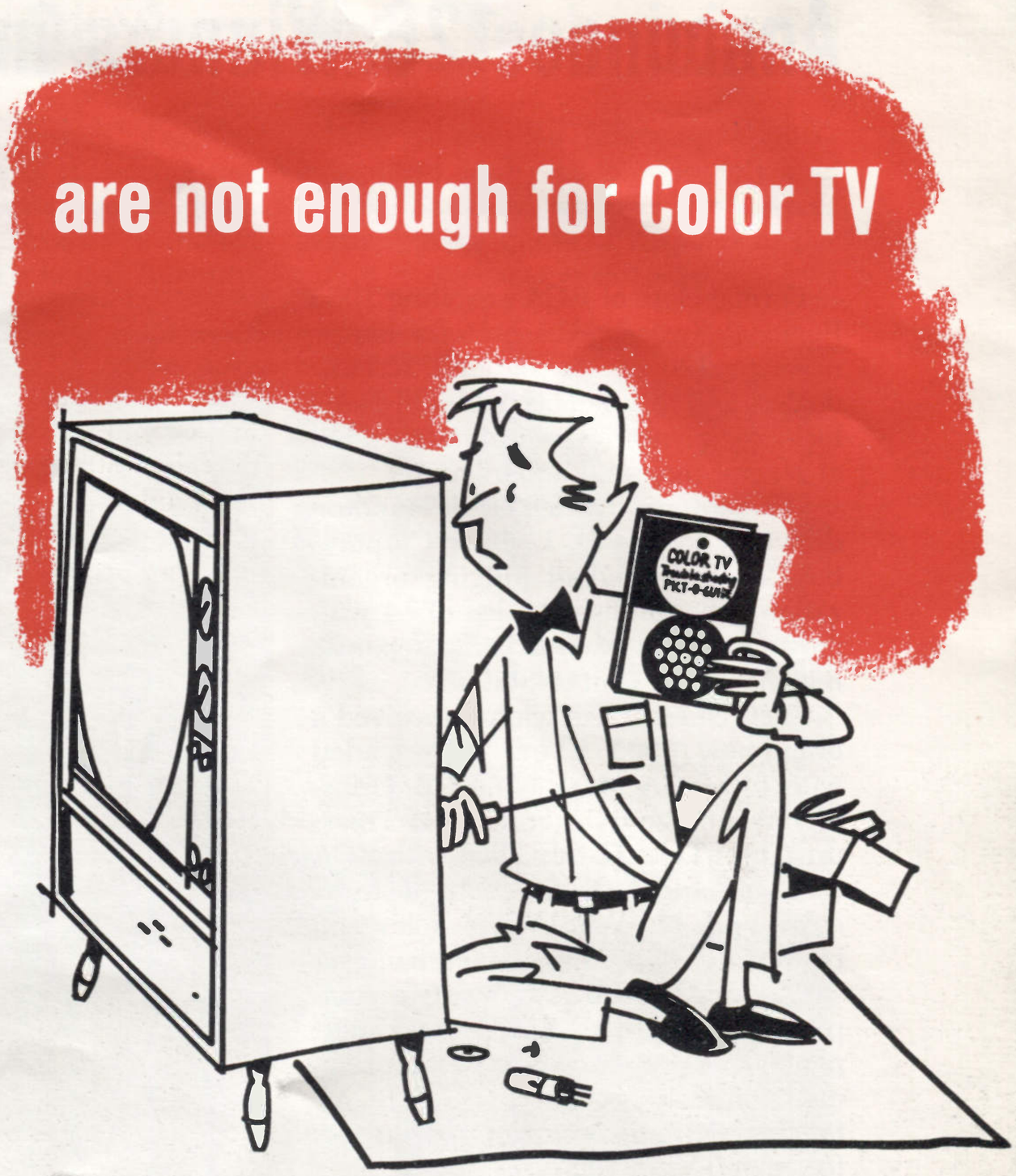
Engineering and marketing details for the newest 90-degree color tube, utilizing rare-earth phosphors, were presented to industry executives during special seminars held in Chicago and Newark, N. J., during the month of August.

Mr. Seelen said the addition of the new tube – not expected to be in production before next year – will give RCA a complete line of 15-, 19-, and 25-inch rectangular color tubes as well as the 21-inch round version which has been the industry standard for the past decade. RCA's new 15-inch color tube will utilize the three-gun, shadow-mask principle which was developed by the company.

All RCA color television picture tubes for the "original-equipment market" are now being manufactured with improved phosphors which provide much brighter and more vivid color pictures. The brighter RCA color picture tubes utilize greatly advanced green and blue sulfide phosphors, plus "a rare earth red phosphor" which are applied by a new slurry screening process developed by the company. They are being marketed under the company's new "Hi-Lite" brand name.

Your black and white skills are not enough for Color TV





You need this book to help you cash in on Color TV business

(For a complete course in the principles and practices of color TV you will find the 8 lesson Color TV Home Study Course by RCA Institutes, 1A1325, invaluable.)

NEW RCA COLOR TV TROUBLESHOOTING PICT-O-GUIDE, 1A1389

You're missing more and more chances for profit if you're not in color TV service. There are 3 million color sets in use now... and the total should be at least 5 million by the end of the year.

The new, completely revised RCA Color TV Pict-O-Guide, with its many color photos and illustrated step-by-step instructions makes it possible for you to recognize and understand the visible symptoms of troubles and maladjustments in color receivers. Use the Pict-O-Guide whenever you work on a color set.

RCA ELECTRONIC COMPONENTS AND DEVICES, HARRISON, N. J.

WHAT THE RCA COLOR TV PICT-O-GUIDE GIVES YOU:

- ☐ Color Fundamentals
- ☐ Receiver Set-Up
- ☐ Functions of the Color Set Controls
- ☐ How to Use Color Test Equipment
- ☐ Troubleshooting Color and Black and White Sections of Receiver
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...and much, much more. 150 pages. *This book should more than pay for itself the first time you use it.*

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Announce 126 Winners in Exclusive National Drawing He

Nine Grand Prizes Awarded in RCA Regional Sweepstakes

Formal close of RCA's exciting 1965 Regional Sweepstakes brought happy news to 126 of the nation's service-dealers and technicians, including nine lucky recipients of Grand Prizes valued at several thousand dollars each.

Winners were selected in random drawings by the D. L. Blair Corporation, an independent judging organization, who published a list of 14 winning entries in each of nine separate regions of the United States.

Each Grand Prize winner received a brand-new 1965 Chevy Van loaded with two RCA Mark Nine CB Transceivers, a large RCA *Superweld* Treasure Chest Tube Caddy filled with RCA receiving tubes, a selection of three color and black-and-white television picture tubes, a counter merchandiser stocked with RCA batteries, two complete kits of RCA's newest and most popular entertainment-type replacement transistors, and five of RCA's famous high-precision test instruments for color-TV servicing.

Second Prize consisted of an RCA Victor "Longport" 21-Inch High-Fidelity Color-TV Receiver Model GF-641.

Winners of the Third Prize received an RCA Victor "Funster" 16-Inch Portable-TV Receiver Model AF-020, while Fourth-Prize recipients were presented with an RCA Victor "Marathon" 8-Transistor Portable Radio Receiver Model RFG20.

For each of the nine top winners, the rich bonanza meant virtually a complete inventory of the major items required in the servicing business – a windfall of good fortune that was fervently hoped for but totally unexpected.

In San Leandro, Calif., for example, neither Frank B. Garcia nor any members of his family had ever won anything in a contest. It was only a faint glimmer of hope – plus a strong desire to win – that impelled him to submit the single entry he mailed just before the deadline.

Operating under the business name of "Garcia Radio and Television Repair," 1543 166th Avenue, Mr. Garcia is a full-time radio/TV/hi-fi service technician. His neatly arranged, well-organized shop – connected to his residence – suggests a high degree of work efficiency.

Now fifty-five, Mr. Garcia entered

Grand-Prize Winner Frank B. Garcia, center, is congratulated by John J. McLernon, Manager, Western Distributor Sales District, RCA Electronic Components and Devices. At left are A. T. Styles and G. C. Engelman, of Styles & Engelman Electronics, Hayward, Cal., RCA distributor. Standing at right is R. W. "Randy" Frisbee, area RCA Distributor Sales representative.

Seated in the cab of his brand-new 1965 Chevy Van, Joseph Anthony Miro, owner of Yonkers Audio Service, Yonkers, N. Y., accepts keys from W. H. "Win" Allen, Manager, Eastern Distributor Sales District, RCA Electronic Components and Devices. At left is Arthur Stangel, Vice President, Yonkers Electronic Supply, and at right, Charles E. Jacobs, RCA sales representative.

ield for Radio/TV/Hi-Fi Service-Dealers and Technicians

the field of electronics in 1932 as a student in Oakland's Central Trade School, where he studied telegraphy and radio servicing.

During World War II, he entered the U.S. Army Signal Corps as a private and advanced to technical sergeant, accompanying combat troops all the way from the Normandy beaches to Salzburg, Austria. For his meritorious service against the enemy, he was awarded the Bronze Star Medal.

Grand-Prize Winner Joseph A. Miro, of Yonkers, N. Y., likewise submitted only one entry form in the RCA Regional Sweepstakes. Only twenty-nine, he already has been in his own business for three years, operating under the name "Yonkers Audio Service," at 12 Engine Place.

"Always interested in everything electrical and electronic," Mr. Miro furthered his training in the field of electronics at the Saunders Trade School, also in Yonkers. Following graduation, and prior to military service, he went into business for himself on a small scale – repairing radios, TV sets, and hi-fi equipment.

Mr. Miro and his wife, Catherine, and their 2½-year-old daughter, Jo Ann, live in a Bronx River apartment. At home, he derives special pleasure from his hobbies of good music and stereo through an ingenious setup that pipes music to every room. This interest and skill in stereo/hi-fi has also brought him many new customers, and indirectly resulted in an installation-service agreement with the Yonkers Police Depa ent for work on their car radios.

eady e and into a -day, 70-hour per w k operation, the busin has sho ntinual gro h d Mr. ro hopes hire additional help in the future.

Youngest of the nine Grand-P e nners, ho ver, is 23-year-old John R. Agner, who entered the Sweeps es on the last day of the contest on a spur-of-the-moment decision.

A resid t of Ottawa, Ohio, he is employed as a r io and television repai an the Meyers Elec c Company, ipsic, Ohio. His fo al tr ing in ctr ics includes attendance at the DeVry Te nical In tute in Chicago. He is currently enroll as a correspond ce student with the Cleveland Institute of Electr cs in Cleveland, Ohio.

inner of the Regio l Grand Prize in the ntral Region was Sal ny J. Bonadona, of 155 Mildred Lane, Chicago Heights, Ill.

Married to the former Lorraine Rosati and the father of three children, Mr. Bonadona is thirty-three years old. His interest in electronics attracted him to the DeVry Technical Institute, where he enrolled following graduation from high school. He left this school, however, to enter the service. Attaining the grade of corporal in the

(Continued on next page)

Grand-Prize Winner John R. Agner, center, is congratulated by Richard Roberts, Branch Manager, Allied Supply Company, Inc., Lima, Ohio, RCA distributor. At left are Robert W. Meyers, owner of Meyers Electric, Leipsic, Ohio, and W. F. "Bill" Cornelius, RCA sales representative. At right is G. R. "Pat" Vance, Manager, RCA's East Central Distributor Sales District.

Grand Prize in RCA's Central Distribu Sales District was awarded to S. J. "Salvy" Bonadona, of Illinois Television and Appliances, Chicago Heights, Ill. Here, Mr. Bonadona (third from right) is congratulated by R. J. "Bob" Liska, local RCA Distributor Sales representative. Others in picture, left to right, are: John Vedo, area salesman for Allied Radio Corporation, RCA distributor; Jules Rubin, Allied's Director of Public Relations; Joe Foisy, Allied's Sales Manager; and Joe Pokonosky, Assistant Sales Manager.

Announce RCA 1965 Regional Sweepstakes Winners

(Continued from preceding page)

U.S. Army Signal Corps, he was selected for training as a radar technician after achieving a better-than-90 average in his electronics courses. He later was assigned to the White Sands Proving Grounds in New Mexico as a missile tracker.

Today, he works as an electronics technician for "Illinois Television and Appliances," 2726 Chicago Road, Chicago Heights, Ill., a business owned by his father, Joseph Bonadona.

In the Southeastern Region, Lady Luck singled out Aaron Caswell Edmundson, 206 North Grandelle St., Edenton, N. C., for the big jackpot. A graduate of the University of North Carolina, Mr. Edmundson and his wife, Ann, have two boys. He is a manager for the Western Gas Service Company, 313 South Broad St., Edenton. The latter company carries an RCA dealership and has a large radio/TV/hi-fi service department.

Out in the Land of the Rockies, the happy tidings went to Anthony Larotunda, 6585 Winona Court, Denver, Colo.

A Denver resident since 1945, when he was discharged as a sergeant from the Army Air Corps, Mr. Larotunda hails from Pittsburgh. He and his wife, Opel, whom he met in Denver, have three children.

One of the nine Grand-Prize winners in RCA's 1965 Regional Sweepstakes was Caswell Edmundson, second from right, who is shown receiving keys to Chevy Van from A. O. "Al" Ellingson, area sales representative, RCA Southeastern Distributor Sales District. Looking on are Lloyd A. Amyette and Garland E. Hoke, officials of Southeastern Radio Supply Company, RCA distributor. Mr. Edmundson is a manager for the Western Gas Service Company, Edenton, N. C., which carries an RCA dealership and has a large radio/TV/hi-fi service department.

From 1946 to 1948, Mr. Larotunda attended the Penn Tech Institute Electronic School, after which he joined the teaching staff of a Denver electronics school. He remained in this post until early 1965, when he decided to open his own radio and television servicing establishment. The "Larotunda Radio and TV Repair Shop" is located at 3215 Lowell Blvd., Denver.

Chevy Van truck and load of RCA products won by Anthony Larotunda, owner of Larotunda Radio and TV Repair Shop, Denver, Colo., is displayed in front of his servicing establishment shortly after delivery. Mr. Larotunda, left, here receives keys from A. K. "Andy" Mallard, Manager, West Central Distributor Sales District, RCA Electronic Components and Devices. In center is D. N. Fistell, of Fistell's Electronics Supply, Denver, an RCA distributor.

In Pine Bluff, Ark., the lure and luster of the Chevy Van truck and RCA products impelled Tommy Lee Shell and his brother, James, to enter the Regional Sweepstakes in earnest. One entry mailed by Tommy Lee Shell drew the Grand Prize.

A partner in the "James E. Shell Radio & TV Service" – a business founded by his brother – Tommy Lee Shell personally makes up to 80 service calls per week. He estimates that anywhere from 10 to 15 of these calls are for the installation and servicing of color-TV sets. Located at 713 Linden, Pine Bluff, the business also employs two additional full-time employees and two part-time employees. Residing at 2103 West 32nd St., Pine Bluff, Tommy Lee Shell and his wife, Carolyn, have a daughter, Kay Carol, nineteen years old.

Another winner for whom the Grand Prize represents a special godsend is Garabed Terzian, of 4301 Chestnut St., Philadelphia.

In 1958, Mr. Terzian established his current business, "Master Radio & TV Service," at 4305 Locust St., Philadelphia. He now employs one assistant.

Interested in his chosen field since he was a youngster, he first attended

James E. Shell, left, and Tommy Lee Shell, right, of the James E. Shell Radio & TV Service, Pine Bluff, Ark., Regional Sweepstakes Grand-Prize winners in RCA's Southwestern Distributor Sales District, display the brand-new additions to their servicing business. Among those present for the formal award ceremony were Bill Jackson, Jr., and Ray Tucker, both of the Frank Lyon Company, RCA distributor; and Oscar A. Goedecke, III, and Guy Rutherford, Manager and sales representative, respectively, of RCA's Southwestern Distributor Sales District.

Wife and son in foreground, Garabed Terzian happily accepts keys to Chevy Van from J. R. "Joe" Fleming, area RCA sales representative for Mideastern Distributor Sales District. At left is Harry V. Somerville, Director, Distribution, Electronic Products, RCA. Shown at right (left to right) are Syd Love and Richard Buemi, General Manager and local store manager, respectively, for Radio Electric Service Company, RCA distributor; and Maurice Schwartz, Vice President, Radio Electric Service Company of Pennsylvania, Division of Astrex, Inc. In background is Mr. Terzian's business establishment, "Master Radio & TV Service," which is located at 4305 Locust St., Philadelphia. (Editor's Note: As "Service News" went to press, sad word was received of the death of RCA's Joe Fleming, fourth from right, above. Joe, long a popular figure among service-dealers and distributors in the Philadelphia-Camden area, had been with RCA for over 20 years.)

radio and electronics school and then earned a Bachelor of Science degree.

Demonstrating a high order of skill and acumen, he has constantly added new names to his list of satisfied customers. Now, with his new Chevy Van and other valuable work aids, he expects to quicken this pace. He and his wife, Ahavhi, have two boys of the ages three and one.

Of the nine Grand-Prize winners, perhaps none better exemplifies the experience and stability of the veteran service technician than 66-year-old Daniel Joseph Murphy, of Upper Main St., Nantucket, Mass.

Truly a pioneer in his chosen field, Mr. Murphy was born in Newport, R. I., where his interest in telegraphy attracted him to the Western Union organization at an early age.

Leaving that company to enlist in the U.S. Navy in 1917, he was sent to Harvard Radio School for instruction. He was graduated as a Radio Electrician-Third Class, and assigned to the Atlantic Aviation Patrol of the then-fledgling naval air force. After the war, he decided to make the Navy his career, and subsequently was placed in charge of reconditioning the old Marconi Radio Station at Siasconset,

(Continued on next page)

RCA 1965 Regional Sweepstakes Winners

(Continued from preceding page)

Mass. Later assignments included sea duty on the battleships *U.S.S. Florida* and *New Mexico*, and the cruiser *U.S.S. Pensacola*. Shore tours included supervision of Radio Compass Station *Surfside*, in Nantucket, and the radio direction-finder station at Bar Harbor, Maine.

Attending the Navy's Advanced Radio Materiel School in Washington, D.C., he was graduated sixth in his class.

It was while assigned to the Marconi Radio Station in Siasconset that he met the former Ruth Marion Burchell. They were wed in July, 1921.

Retiring from active duty to Fleet Reserve status in 1934, Mr. Murphy became a Civil Service employee at the Newport Torpedo Station, where he worked as an electrician in the Research Department. Recalled to active duty in June, 1941, he was assigned to a special project at the U.S. Navy submarine base at Pearl Harbor, Hawaii.

The Murphy family was at Oahu when the Japanese attacked there. After aiding to safely evacuate his wife and children on Christmas Day, 1941, Mr. Murphy continued on with 32 more months of special submarine duty in New Guinea, Guam, Australia, and other points in the South Pacific. He was transferred to New London, Conn., in June, 1944, and shortly afterward assigned to the Electronic Field Service Group Naval Research Laboratory in Washington, D. C., and to the Multiplex School in New York City. He retired from the Navy as a Chief Warrant Officer in April, 1947.

Returning to his beloved Nantucket, Mr. Murphy decided to establish a

Daniel J. Murphy, left, receives keys to new Chevy-Van truck he won in RCA's 1965 Regional Sweepstakes from John J. Hemberger, Manager, Northeastern Distributor Sales District, RCA Electronic Components and Devices. At Mr. Hemberger's left is Preston Gifford, Manager, C. E. Beckman Company, New Bedford, Mass., RCA distributor. On far right is Tom E. McKeown, Distributor Sales representative for RCA.

Second Prize — RCA Victor Color Television Set

Bernhardi, J. — Rochester, N. Y.
Brown, R. — Terre Haute, Ind.
Bullington, G. — Pittsboro, N. C.
Cobbs, H. — Mount Olive, N. C.
Douglas, W. — Harrisburg, Pa.
Fisher, H. — Hudson, Mass.
Fuson, F. — Las Vegas, Nev.
Griffith, D. — Mound City, Mo.
Groschefsky, P. — Monsey, N. Y.
Huggens, R. — York, Pa.
Lebel, R. — Flushing, N. Y.
Pearce, R. — Eureka, Calif.
Reyna, R. — Lamarque, Texas
Saibara, R. — Houston, Texas
Skoglund, D. — Minneapolis, Minn.
Summers, F. — Omaha, Nebr.
Wolf, J. — Cadillac, Mich.
Zafaras, W. — Monroeville, Pa.

Third Prize — RCA Victor Black-and-White Portable Television Set

Bertsch, W. — Redlands, Calif.
Chislock, M. — Greensburg, Pa.
Conavatchel, J. — Bronx, N. Y.
Corbin, V. — Chenango Forks, N. Y.
Crisci, R. — Brooklyn, N. Y.
Felton, V. — Dayton, Ohio
Gray, C. — Hueytown, Ala.
Hawkins, B. — Ellenboro, N. C.
Keaton, W. — Indianapolis, Ind.
Knipfel, J. — Montgomery City, Mo.
Lawson, R. — Glenolden, Pa.
Lundquist, W. — Marquette, Mich.
McMurray, D. — Spindale, N. C.
Methner, C. — Drayton Plains, Mich.
Mitchell, D. — Skowhegan, Me.
Morel, J. — Oklahoma City, Okla.
Mullins, M. — Schuylkill Haven, Pa.
Neal, L. — Burbank, Calif.
Nishimori, T. — Winslow, Wash.
Scheller, J. — Mahopac, N. Y.
Scherr, S. — Yonkers, N. Y.
Sierra, F. — Chalmette, La.
Snyder, R. — Allentown, Pa.
Stout, R. — Marion, Ind.
Sturgis, H. — Memphis, Tenn.
Terry, F. — Atchison, Kans.
Woodfin, C. — Colorado Springs, Colo.

radio and television servicing business to keep himself occupied. The business outgrew the original small shop and all subsequent additions. It is now located at 8 Federal Street, in the main business district, where three generations of Murphys are busily at work in the selling and servicing of radios, stereo/hi-fi's, and black-and-white and color television receivers. Mr. Murphy, in the meantime, keeps up with all the latest advances by successfully completing special courses, including the RCA Institutes Home Study Course in Color Television.

Strictly a family affair, the business is run with smoothness and precision. Mrs. Murphy serves as Office Manager. A daughter, Mary Elizabeth, is in charge of sales. Mary Elizabeth's husband, Gilbert Boyer, is"First Radio and Television Technician." Carol Ann, their daughter, is Assistant Bookkeeper. Carol Ann's husband, C. Rollin Manville III, is "Second Radio and Television Technician."

Despite the heavy demands of his business, Mr. Murphy has managed to maintain active memberships in the Nantucket Chamber of Commerce, the Rotary Club, and the Retired Officers and Fleet Reserve Associations. He also finds occasional time for his favorite sports of golf, hunting, and fishing.

In every instance, the Grand Prize has brought special fulfillment to its recipient — furtherance of business, job, general outlook, and economic well-being — all of which makes the 1965 Regional Sweepstakes end on a particularly happy note.

Old cobblestone street and historic Nantucket mansion provide picturesque setting as Daniel J. Murphy begins first day of service calls with new Chevy Van and RCA tube caddy.

To each of these winners — and to all 117 other winners in the Sweepstakes — go the hearty congratulations of RCA and its distributors.

Fourth Prize — RCA Victor Transistor Radio

Abaid, E. — Dedham, Mass.
Adkison, W. — Yale, Okla.
Anderson, C. — Kingsport, Tenn.
Bergstrom, P. — Park Ridge, Ill.
Bibeau, A. — Worcester, Mass.
Brotman, M. — Baltimore, Md.
Burck, C. — Ely, Minn.
Burnett, J. — Thermal, Calif.
Charties, M. — Dodge City, Kans.
Dainwood, J. — Beaumont, Texas
Davidson, S. — Livingston, N. J.
Davison, J. — Baltimore, Md.
DeCandia, J. — Rutherford, N. J.
Decker, W. — Stony Point, N. Y.
Dye, E. — Bement, Ill.
Edwards, F. — Manchester, Conn.
Ellis, G. — New Lexington, Ohio
Farris, T. — Vicksburg, Miss.
Fastnaught, R. — Washington, D. C.
Furguile, J. — Anderson, S. C.
Gallagher, W. — Quaker City, Ohio
Goad, J. — Washington, D. C.
Godley, J. — Woodbine, Ga.
Gosselink, L. — Pella, Iowa
Greene, T. — Horseheads, N. Y.
Harris, B. — Gahanna, Ohio
Harrison, R. — Atlantic City, N. J.
Heath, H. — Lubbock, Texas
Hicks, B. — Goodlettsville, Tenn.
Hobizal, T. — Flatonia, Texas
Judd, F. — Tuscaloosa, Ala.
Judkins, H. — Garden Grove, Calif.
Kaiser, A. — Penacook, N. H.
Kaiser, R. — Aitkin, Minn.
Kauffman, E. — Elizabethtown, Pa.
Kauffman, J. — Reading, Pa.
Kirkland, J. — Albion, Mich.
Layton, R. — Harrison, N. Y.
Leko, C. — St. Paul, Minn.
Lescalleet, H. — Las Cruces, N. Mex.
Liberator, E. — Culver City, Calif.
Maltzman, A. — Brooklyn, N. Y.
May, R. — Macomb, Ill.
Miller, C. — Wichita, Kans.
Mongiello, S. — Bloomfield, N. J.
Moniz, M. — Somerset, Mass.
Moore, F. — Aberdeen, Md.
Niemey, A. — Minneapolis, Minn.
Orlando, A. — Oak Park, Ill.
Overstreet, R. — Indianola, Iowa
Palumbo, P. — Werrton, W. Va.
Perrone, B. — Island Park, N. Y.
Peterson, W. — Rye, N. Y.
Phillips, M. — Trenton, Mich.
Richert, R. — Roseville, Mich.
Roach, A. — North Platte, Nebr.
Rooks, A. — Highland Falls, N. Y.
Skeen, J. — Austin, Texas
Smith, N. — Goldsboro, N. C.
Smith, O. — Clarkston, Wash.
Sparling, W. — Wabash, Ind.
Swiney, G. — Westminster, Colo.
Szalma, B. — Youngstown, Ohio
Taylor, C. — Houston, Texas
Tenhaeff, E. — Denver, Colo.
Tolman, E. — Redmond, Wash.
Torrence, W. — Columbia, S. C.
Williams, B. — Lubbock, Texas
Wyatt, D. — Pittsburg, Calif.
Wyndham, E. — Banneau, S. C.
Yazigi, G. — Sacramento, Calif.
Zdeb, S. — Chicopee, Mass.

Across the Bench

By 'Doc'

Callbacks are more than a nuisance — they're *money wasters*. I have not found a way to avoid them all. I just try to minimize them.

The worst kind of callback, I think, is the one you *never* make. It's the call your competitor gets when a customer has lost confidence in your service.

Very often, it's not your fault. A set can develop new trouble before the guarantee period you allow on the prior repair job has elapsed. Or, the trouble can be intermittent and clear itself just as you walk into the room to fix it. Those are the breaks.

Sometimes, however, the trouble will recur because the service chap wasn't on his toes. In such cases, the customer may do what Mr. Wilson did last week — call another shop. I was the one he called.

Arriving at the Wilson home, I set my tube caddy on the living-room floor and sized up the blank set. It was a CTC12 color chassis.

"This other fellow was here twice," Mr. Wilson muttered. "It only worked for a few days each time."

"What seems to be the matter?" I asked cautiously.

"Well, the picture sometimes gets very bright and blurry, and sort of spreads in and out. It's not so bad when I turn the brightness knob down. But we haven't been able to get a good color show."

That sounded like voltage-regulator trouble. I removed the back panel from the set and sniffed. No odor of burned parts. I then plugged in the cheater cord and switched on the set.

Both sound and picture came on. I switched the tuner dial around to make sure all local channels came through. Sync was good.

I tuned in a black-and-white program and turned the brightness control back and forth. The picture bloomed badly, changed size, and lost focus. I shut off the set.

Mr. Wilson watched glumly as I took the metal plate off the high-voltage box.

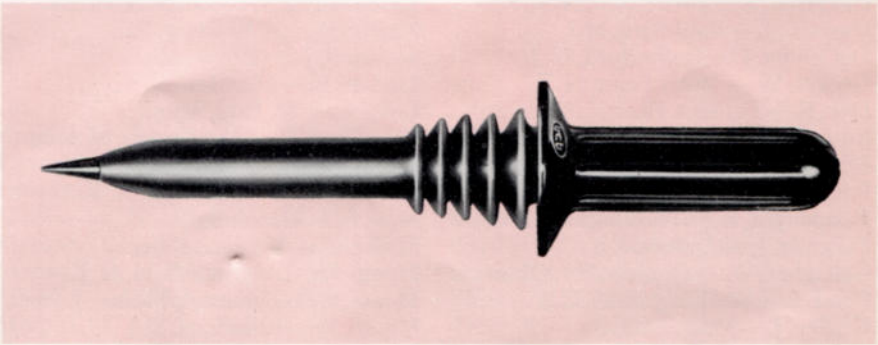
"That's the same place the other fellow looked," he said dejectedly. "He replaced a tube in there twice."

"He looked in the right place, Mr. Wilson," I replied — trying to bolster the sagging reputation of the TV-servicing fraternity in the Wilson household. "This is the first section to check in trouble of this sort."

I looked at the 6BK4 high-voltage regulator — a bright, new RCA tube. I took my WV-38A Volt-Ohm-Milliammeter and high-voltage probe from the caddy, plugged the leads into the V-O-M, and set the instrument up for measurements on the 50,000-volt DC range.

The high-voltage measurement took only seconds. With the ground lead clipped to the receiver chassis, I touched the tip of the long, insulated probe to the anode connector at the picture tube. As I rotated the bright-

RCA's WV-38A Volt-Ohm-Milliammeter can be used for making all necessary current measurements in color-TV receivers. It can also measure DC voltages from 0.25 volt to 5,000 volts (full-scale values).



Sturdy and safe, RCA high-voltage probes can be used with the WV-38A or any VoltOhmyst® to measure picture tube voltages as high as 50,000 volts DC. Shown here is the WG-297.

ness control, the voltage ranged up to 30 KV. In the CTC12, anode voltages should hold at 24 KV. I then adjusted the high-voltage control on the back apron for 24 KV and again shut off the set.

I set up the WV-38A for direct-current measurements on the 500-ma range, and changed test leads. From my caddy, I took my "Doc's Special" — a homemade octal-socket adapter for checking 6JE6 output tubes. All top pins connect through except Pin 3, the cathode connection. I plugged the adapter into the 6JE6 socket, pushed in the tube, and connected the plate-cap lead.

I had a strong suspicion that the areas I was about to check had been overlooked when the set was last serviced because in many sets such checks can only be made by use of adapters or by disconnecting soldered jumpers.

With power still off, I connected the test leads of the WV-38A to Pin 3 of the adapter and to ground. When I turned on the set, cathode current was high. I fished an alignment stick from the caddy, stuck it into the core of the horizontal-efficiency coil, and turned the core. Cathode current dropped to a normal 210 ma. I backed off a quarter-turn and shut off the set.

By now, Mr. Wilson was watching intently. With the 6JE6 back in its original socket, I turned down receiver brightness and remeasured the high voltage. I readjusted the high-voltage pot slightly for exactly 24 KV. Now, the sole remaining check was a look at the shunt-regulator current.

Shunt regulator current can be measured by use of an adapter having Pin 1 open (cathode) or by opening a jumper in the 6BK4 cathode circuit.

Other receivers have a 1,000-ohm resistor in this circuit, and current is checked by measuring voltage drop across the resistor. This CTC12 had a 1,000-ohm resistor which produced a drop of 1 to 1.4 volts, indicating a regulator-tube current of 1 to 1.4 ma. Under normal conditions, voltage should not read less than 0.85 volt.

The WV-38A, which has full-scale current ranges from 50 microamperes to 10 amperes, is especially good for current measurements because of its insulated, plastic case. This feature is useful when both test leads must be connected to curr t or voltage points a ve ground and danger of a "hot" ins ment case ists.

The voltage che ind ted 1.2 m peres. Up to s time, I was not certain that the re lator tube was still good. These tubes take a beating even der normal conditions. Unless high-voltage and current are checked when they are replaced, they may be forced to operate far above their ratings. Under normal conditions, with brightness turned down, they must dissipate approximately 25 watts of power.

As a final check, I remeasured the 6JE6 cathode current, which had been unaffected by the adjustments. I checked the raster, and touched up the focus, height, and linearity controls.

hen I again rotated the brightness control, there was no sign of blooming or defocusing.

" e other fellow didn't go ough all that," Mr. Wilson commented.

I wasn't sure of what to say. I know that you should never replace a regulator tube without also checking the high-voltage adjustment. I thought every service tech knew it. The inspection frequently reveals that some readjustment is needed.

"I don't think you'll have any more of that trouble — at least for quite a while," I said, dodging his comm t. "Some es a set is a to act up."

" d sometimes a repair fellow is in a hu to get home," replied Mr. il-son th a grin.

How the High-Voltage Regulator Works

High voltage in a color-television receiver must be kept constant at all levels of picture-tube beam current to prevent blooming and changes in raster size as the brightness level of the picture changes. Voltage is kept constant by a shunt regulator circuit, illustrated in the accompanying diagram, Figure 1.

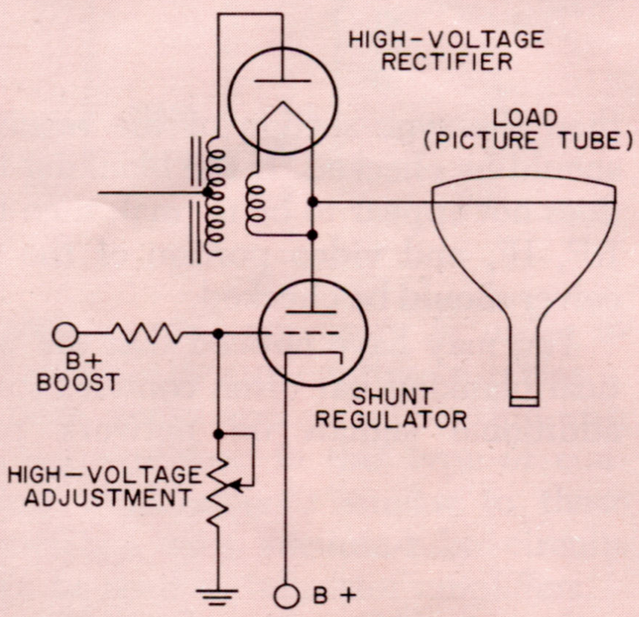


Figure 1: Simplified regulator circuit.

The triode regulator tube acts to maintain a constant load on the high-voltage supply. When the incoming signal drives the picture down to the darkness level, picture-tube beam current is cut off, and maximum current flows through the regulator. At the highest brightness level, regulator current drops to its minimum value. Thus, load current on the power supply is held constant, and high voltage remains at a fixed level.

Grid voltage for the regulator tube is taken from a voltage divider in the B+ boost supply. The exact voltage-operating point is determined by the setting of the high-voltage adjustment. This control is set so that the regulator tube passes enough current to absorb the normal current load of the supply when the picture tube is cut off (black).

If high voltage starts to decrease because of increased beam current, the B+ boost voltage also drops and the grid of the triode becomes less positive. Regulator-tube plate current likewise decreases to compensate for the initial increase in picture-tube beam current.

Without this regulation, voltage can vary over an extreme range, as shown in Figure 2, below.

If the regulator tube is disconnected or not functioning, anode voltage can rise as high as 35 kilovolts when beam current drops to zero (black level). At a maximum beam current of 1 ma, anode voltage should hold at 24 or 25 KV, depending on receiver design.

Precaution: When changing the voltage-regulator tube in a color receiver, always check (and adjust, if necessary) the high-voltage control. It is also good practice to measure regulator-tube current and the current drawn by the horizontal-deflection output tube.

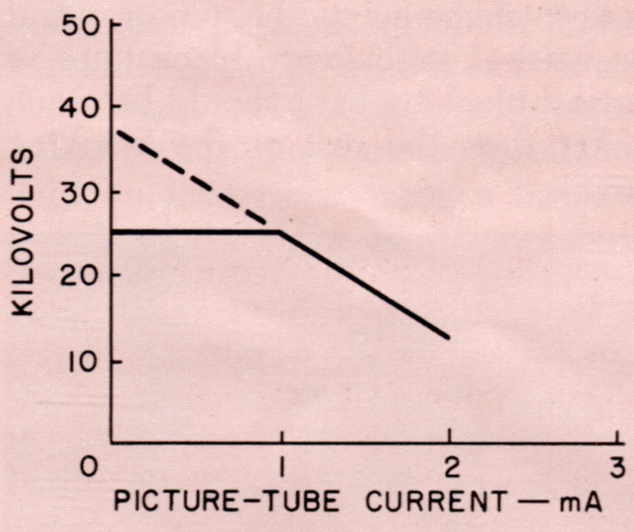


Figure 2: Regulator action.

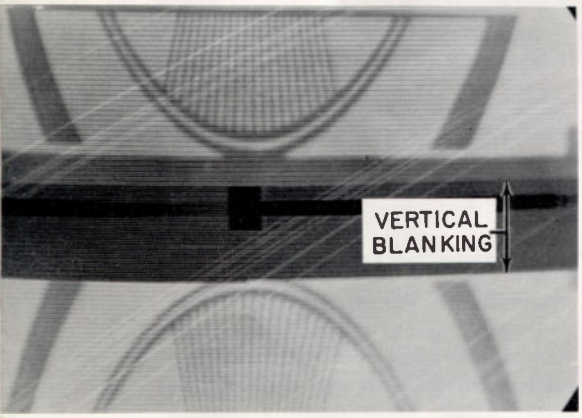
From the RCA Sales Corporation:

PLAIN TALK AND Technical Tips

The Vertical Blanking Bar

Many service technicians make use of the *vertical blanking bar* to check and adjust the vertical height and linearity controls of a television receiver. In the absence of a test pattern, the vertical blanking bar can be used to check vertical linearity and height. This may be done by adjusting the vertical hold control so that the picture rolls downward, and checking for uniform width of the vertical blanking bar as it travels from top to bottom of the screen.

The vertical blanking bar also can be used to evaluate the video performance of a television receiver. Its shade of darkness should correspond with the darkest elements in the picture, and the vertical sync (very black lines in vertical blanking bar) should be much darker than the rest of the blanking bar.



Vertical sync and vertical-blanking bar as seen with picture rolled out of sync, with contrast control turned down, and with brightness control advanced.

Poor low-frequency response in the video amplifier can make the vertical blanking lighter than the darkest picture elements.

When sync trouble occurs and the vertical blanking bar appears normal, then the sync section of the receiver should be checked. If the blanking bar does not appear to be normal, then the RF, IF, and video portion of the receiver should be checked.

You may have noticed that the vertical blanking bar often contains some additional signals on network programs. These are special signals used by the broadcasters and various network facilities to insure high-quality transmission and broadcasting. Special equipment is required to properly display and interpret these test signals.

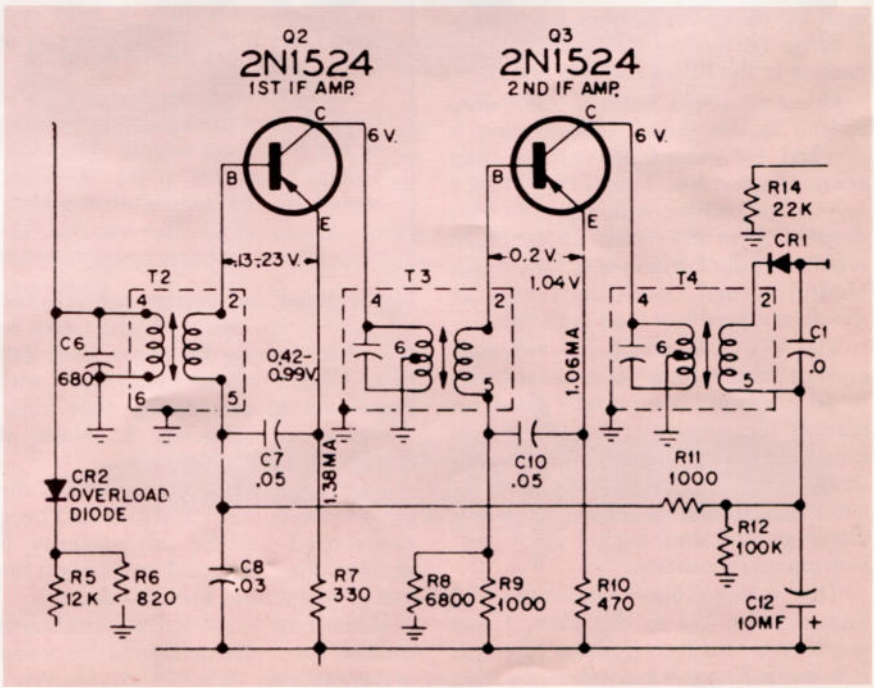
When analyzed by the broadcaster, the test signals will disclose such picture characteristics as *white reference level, sync compression* or "expansion," *ringing, transient response, gain checks*, and many other indications of synchronization and picture quality.

Each network may utilize different test signals, and the individual network frequently switches through a series of such signals. While these signals are not visible to the set owner, the technician will notice their presence when making adjustments. Depending on the type of signal used, they can appear as a series of white dots, a white line, or a series of white lines at the lower portion of the vertical blanking bar.

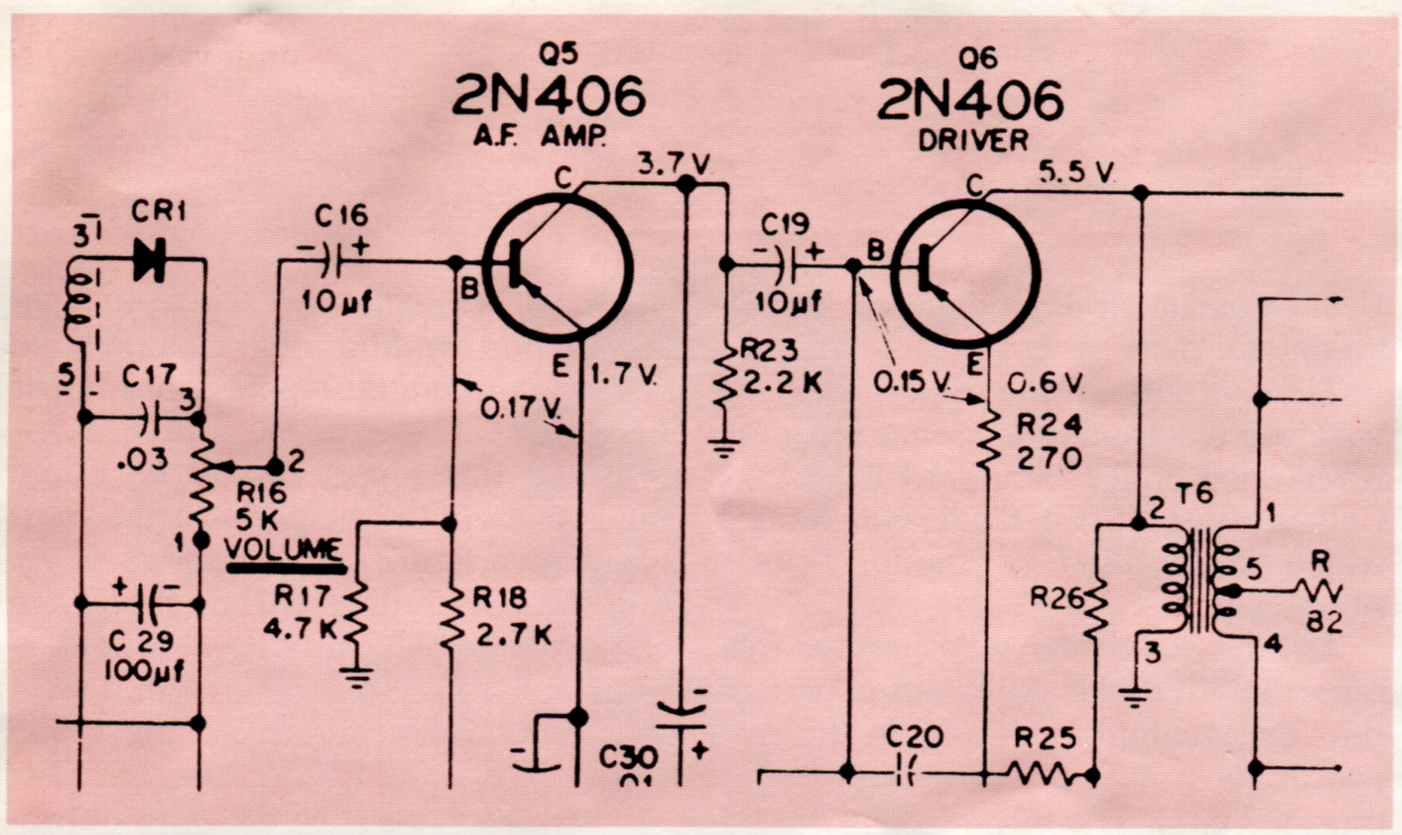
Solid-State Coupling Methods

The basic methods of coupling transistor stages are similar to those used in vacuum tube circuits. The major difference lies in the fact that the input and output resistance of transistors as compared with vacuum tubes vary widely. These resistances depend on the type of transistor used and the operating conditions. In addition, a change in input or output load resistance reflects into the input or output, whichever the case may be. The coupling requirements for transistors can be met by various methods, among which are the following:

• **Transformer Coupling.** Transformer coupling of transistor stages is often used with a grounded emitter circuit employing fixed and self bias and an emitter resistor for stabilization. The biggest advantage of this circuit is that the input and output impedance of the transistor can be matched for maximum power gain. A



Typical Transformer Coupling



Typical R-C Coupling

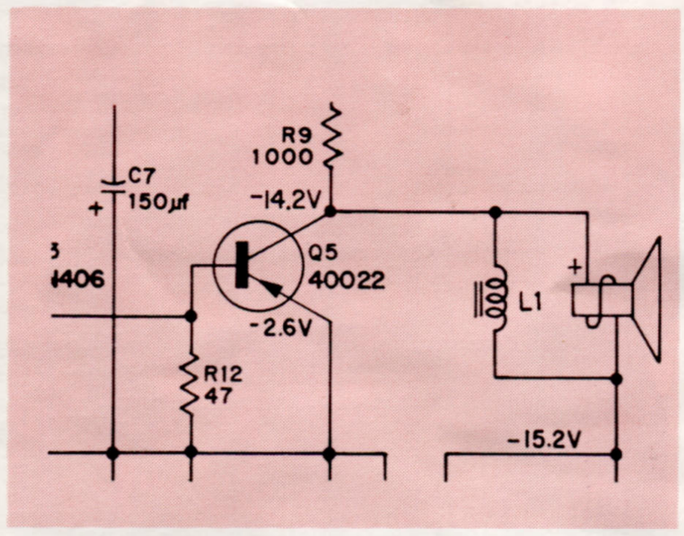
step-down transformer is used from the collector of the preceding stage to the base of the following grounded emitter stage. Due to this step down, it would seem that a voltage loss would appear across the secondary. It must be remembered, however, that a transistor is a *current-operated* device – not a voltage-operated device such as the vacuum tube. This step down provides the best power transfer. The change in base current, due to the presence of the signal, activates transistor action and a power gain can be measured across the primary winding in the collector circuit. Transformer coupling can be used to advantage in IF stages or any RF application where selectivity is req ' ed. They are also us in audio circuits such as 'vers and output stages.

• **R-C Coup ' g.** R-C coup ' g is desirable where -level audio si als are involv , since transfo ers are more susceptible to hum pic p and also take up space. The method of bias for R-C coupling is s' ilar to that used in transfo er coupling. The coupling capacitor must be made very large (2 to 10 microfarads) due to the small ou u and input r 'st ces in lv . ould be not that electrolytic capacitors are used for coupling whereas y are not us in electron e ' cuits. It is therefore vital that polarity be observ or d age to the capacitors and po 'bly the transistor may occ . Leakage c ent in coupling capacitors is not as critical in transistor circuits as in tube circuits.

• **ped ce Coup ' g.** Impedance coup ' g is similar to R-C coup ' g. The major ' erence lies in the fact t inductan are us to replace the load r ' tors. This e of u- pling may be used for ' cuit plications a ve audio fr cies. Resistors are still necessary in order to provide the proper emitter-base bias.

Both, series and shunt peaking, can be accomplished in this type of coupling. Peaking coils similar to those associated with vacuum-tube circuits may be used in transistor amplifiers.

• **Direct Coupling.** Direct coupling is used generally where simplicity is a factor. It is also used, however, where partial DC restoration is required in instruments and where the DC component must be amplified. A common resistor serves as both the collector load of the first transistor and the bias resistor of the second transistor.



Typ ' l Impedance Coupling

Typical Direct Coupling

Transistor Servicing Tips

From a mechanical standpoint, a transistor is in many respects a more rugged device than a vacuum tube. Considerably smaller in size, however, and usually located in compact circuit areas, the transistor requires special working techniques and precautions in its servicing. Here are a few simple rules and procedures for the technician to remember:

• In marked contrast with vacuum tubes, transistors may be damaged by even momentary, "moderate" overloads. Avoid overloads at all times.

• Never work on transistorized equipment with the power on.

• Guard against shorts. A short between the collector and base of a transistor may not only damage the shorted device but other transistors associated with it. This is particularly true in the case of "direct coupled stages" or those in the power amplifier output stage. A short can occur in the time it takes for a falling screwdriver to glance off a pair of socket terminals.

• A transistor may be damaged if its base is placed at – or near – the collector terminal. Make certain, therefore, that the base leg of the biasing circuit is not open on the emitter side.

• When replacing power transistors, make certain there are no metal shavings on hea si or m' insulators which might cause sho or prevent adequate heat dissipation.

• For better heat cond 'on, use silicone grease be e heat sinks a transistors, as well as on th sides of mica insulators.

• hen solde ' g tr istors or other low-wa ge components, use long-nosed p ' s or other heat s' . Grasp the lead to be soldered be een the transistor case and the solde ' g ' n. 's pr ents excessive heat from rea ' g the transistor ' ction and aging it.

• M e certain there are no lea ge paths o the AC line ugh test uipn or solde ' g irons, since ' e voltage appli across o transistor te inals could cause breakdo .

• O ters sh d be us 'th caution because th ' t voltage may exce the itter-base breakdo ltage and destroy the transistor. A VOM having a sensitivity of 20,000 o s per volt or gr ter usually can be used on the -100 scale for short or open checks.

Electronics Servicing is Big Business

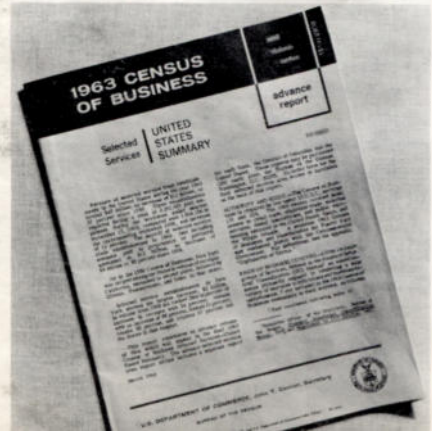
by R. B. Sampson
Manager, Market Development
RCA Electronic Components and Devices

Deeply immersed in the day-to-day servicing problems of his customers and the needs of his business, the average radio/TV/hi-fi service-dealer has had very little time to pursue the industry statistics so avidly followed by broader-based electronics enterprises.

It is also this shortage of time, perhaps, that is responsible for the lack of comprehensive data from the several service-dealer associations. Meaningful statistics regarding the size, shape, and content of the electronics servicing business are difficult to produce on a regular basis. In sharp contrast, manufacturers' trade associations, and — to a lesser degree — agencies dealing with electronics distributors, have produced statistical data which has proved highly useful for market planning and other purposes.

More recently, however, there has been a rising interest in business statistics on the part of the service-dealer. Because the proper "reporting" and development of reliable information is a costly and lengthy process, the newly accumulated data has not been made available at a pace consistent with the rising demand. The dealer, consequently, has found himself at a loss on where to secure the facts and figures desired. More specifically, he has been lately concerned with "numbers" which might reveal how the servicing industry is doing in general and how his performance compares with the overall results.

Fortunately, there is a source — not widely known — for part of this information. It can be found in the "U.S. Census of Business Reports" — issued on a five-year basis. An "advance" report covering data obtained in the 1963 survey was issued last spring, and can be obtained either from the U.S. Bureau of the Census or from the U.S. Department of Commerce, Washington, D. C.



The portion of the report dealing with the electronics servicing business is recorded under "Standard Industrial Classification (SIC) Code No. 7622," which is identified as "Radio, Television Repair."

Any service-dealer who peruses this report might find it expedient to review the "Explanation of Terms" in the Appendix for proper interpretation of the reported data. The following quotation from the Appendix describes the kind and type of establishments which make up SIC 7622:

Radio, Television Repair (SIC 7622) — Establishments primarily engaged in the repair of radio and television sets. Included in this classification are establishments primarily engaged in the repair of aircraft radio equipment. Repair departments of radio and television dealers are not included here unless operated and reported as separate establishments. Establishments primarily engaged in the repair of automobile radios are classified in "Other automobile repair shops" (SIC 7539 part).

While this report should be examined in its entirety, perhaps the most impressive figure is the number of establishments falling within the above classification. This number — 43,208 — represents an increase of 5,324 over the number included in the 1958 report.

Total receipts for these establishments were $628,485,000 (1963) and $478,351,000 (1958) — an increase of $150,134,000 during the five-year period.

A number of conclusions can be drawn from the report. One point, however, stands out clearly: Electronics servicing is *big business* in the U.S.A. The recent emergence and rapidly growing acceptance of color television increases the likelihood that it will remain "big" for many years to come.

Announce Color-TV Picture Tube Socket Adapter And Modification Kit for RCA WT-115A

Growth of RCA's line of test equipment and accessories to meet the increased demands of color-TV servicing is again accelerated with announcement of a socket adapter and modification kit for use with the WT-115A Color Picture Tube Tester.

The new WG-405A Color Picture Tube Socket Adapter and Modification Kit expands applications of the WT-115A to include testing of the 19EXP22, 19EYP22, 25AP22, and 25BP22A color-TV picture tubes.

All current production WT-115A Testers include the socket adapter and the modifications.

Optional Distributor Resale price of the WG-405A Socket Adapter and Modification Kit is $5.95. For further information, contact your local authorized RCA test equipment distributor.

The WT-115A Color Picture Tube Tester is an outstanding test instrument designed specifically for precise measurement of performance characteristics of color-TV picture tubes. Weighing only five pounds, this high-sensitivity unit rates each gun of the color picture tube for emission quality, interelectrode leakage, shorted elements, and warmup performance.

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RCA business uniforms and leisure-wear items are tailored for good looks, comfort, easy laundering, and long wear. *All are completely washable.*

A choice selection of varied-color-and-style cotton twills and poplins, nylons, Dacron polyesters (Dacron is a trademark of duPont), and rayons includes handsome jackets, caps, shirts, and trousers for every work occasion and type of weather. All are designed to provide that added professional look so important to the service-dealer and his place of business.

For complete information on RCA uniforms, ask your local RCA tube distributor for Booklet 1A1529 — "The Complete Guide for the Well-Dressed Service Technician." After you've selected the items you want, he'll be happy to place your order.

Join the many service-dealers and technicians who have learned that good grooming results in greater profits. Act now!

RCA announces a zero defects program

through...

Personal Quality Performance

RCA's effort to apply some of the concepts of missile-type reliability to the production of commercial receiving tubes

You lose time and money whenever a tube fails.

To minimize such losses, RCA has initiated *still another quality control measure* to guard against tube failure and *keep profits in your pocket.*

It's our ZERO DEFECTS program, an attempt to eliminate as far as possible the factor of human error from commercial receiving tube production.

RCA personnel engaged in the production of RCA receiving tubes have voluntarily signed a pledge of PERSONAL QUALITY PERFORMANCE...a pledge to strive for error-free performance in every task they undertake in the making of RCA receiving tubes.

Their pledge is one more assurance to you of tube reliability and greatest possible reduction in callbacks when you sell and install RCA receiving tubes.

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