SYLVANIA NEWS

MERCHANDISING SECTION

MAY-JUNE, 1946 EMPORIUM, PENNA. VOL. 13, NO. 4

SERVICE IS GOOD BUSINESS . . . .

. . . . A Part of the Serviceman

The citation read: "Awarded the Legion of Merit for exceptionally meritorious conduct in performance of outstanding services in North Africa and Italy as Chief Radio Repairman and non-commissioned officer in charge of technical operations.

M/Sgt. Chadwick through his endless study, experimenting and rebuilding radio apparatus, contributed greatly toward the development of an improved radio printer system of communication."

Stan Chadwick's record is typical of many radio men who entered the service and who have now resumed business with a service shop. Stan's place is in Midland Park, New Jersey, formerly operating as the Phelps Manor Radio in Teaneck, New Jersey. He entered the Army Signal Corps in 1943 as a M/Sgt. in charge of technical operations. After many operations in North Africa and Italy, Stan was injured during the Italian campaign and returned home with the Legion of Merit Award.

Stan's radio experience paid off when in the Italian campaign he assisted with the establishment of communications from the Anzio Beachhead to Headquarters, Fifth Army, thus making contact with the British.

Stan is back in business servicing radios for the people around his Midland Park shop. The same habit of service that won him the Legion of Merit as a part of the U. S. Army Signal Corps is earning for him the gratitude and business of the greater number of Midland's populace.

Editor's note: The radio printer built by Stan and his buddies was the forerunner of the system now being used by the Army and more recently adopted to fit the commercial application by Western Union.

SERVICE IS GOOD BUSINESS . . . .

. . . . With A Smile

There are millions of G. I.'s getting reestablished in civilian life Thousands of them are radio service men. They're anxious to get back to the radio shops where they had worked before they went into the service.

They aren't the same men that went away. It was a new life and a tough one. They learned to be friends with a lot of new faces—a smile was a big help to the man beside them going into battle.

Now they know what their country stands for. And is. Their job back home was a part of it in their dreams. And now they appreciate having a business of their own a good deal more. They feel more like being nice to people for they've seen enough suffering. So their service is given with a smile now. And it's good business.

The happy ex-G. I.'s in the picture have returned to the Dale Distributing Company in New York, Connecticut and New Jersey. Measure the smiles from left to right: Allen Schimmel, Richard Stamm, E. R. Glauber, George Wolf, James Manning, Alfred Oliver, Jr., and Frank Frain.

In the Shipping Department

Counting from left to right, we find Joseph Romagnano, Dominick Andreacei, George Sheehy, Daniel Lauria, Joseph Kenny, Marcellino Farmica, Ernest Stewart, John Isaacs, and Herman Little. Al Land, manager of the shipping department and also an ex-GI, was "on leave" when the photograph was taken.

SERVICE IS GOOD BUSINESS . . . .

. . . . Proper Equipment Is A Part Of It

Designed for improved, faster service is this model service bench created by Les Riedman of Riedman Radio Service, 5304 Long Beach Boulevard, Long Beach, California.

Typical of Les Riedman's determination to do a better job, this well-designed service bench incorporates the latest testing equipment with space reserved for additional equipment when available.

A 6-tube, motor-driven radio set is installed permanently in the bench to feed music for advertising outside the building.

Les states that business is good and although one week deliveries are promised on repair jobs, rush jobs are delivered on short notice. Les has been using Sylvania tubes since 1924—nine years before moving to his present location at Long Beach.

"Les" as he is known to the trade is also an ardent amateur. His call letters are W61F.

SYLVANIA DESIGNS 8300 PARTS FOR PRECISION EQUIPMENT

The illustrations at the right are representative of Sylvania's ability to manufacture small parts. Shown here are only a few of the more than 8300 different shapes and sizes of metal and mica parts for electronic tubes and other precision - built equipment. Each part represents high production dies—and where necessary, high precision and progressive dies, requiring hours of careful designing and tool-making.

Parts are produced from mica, plastics and metals: the most common being Steel, Stainless steel, Copper, Copper clad steel, Phosphor bronze, Beryllium copper, Silver, Molybdenum, Molybdenum alloy, Tantalum, Nickel, Nickel alloys and Tungsten.

Parts of various shapes are fabricated from materials ranging in thickness from .002″ to .0625″. A special part for an electronic tube is being manufactured on an automatic press with a progressive die from .005″ material at a rate of 36,000 pieces per hour, 69,000 of these parts weigh one pound.

SYLVANIA NEWS

TECHNICAL SECTION

MAY-JUNE, 1946 EMPORIUM, PENNA. VOL. 13, NO. 4

SYLVANIA TUBES USED IN THE MOON RADAR

Probably most servicemen saw the announcement made on January 25th of this year that on January 10th, success was finally achieved in the attempt to get a radar echo from the moon. As most of you know, previous radiation theories had required that an ionized layer in the stratosphere reflect or refract the radio waves striking it. It is now an established fact that enough energy can be sent through this layer to make interplanetary communication possible.

This may not seem to have much practical value at the present time, but rocket development is rapidly approaching the point where radio control of, or communication with, a rocket flying above the Heaviside layer may be necessary. Many of the fantastic ideas of Jules Verne and H. G. Wells have become possible and interplanetary rockets may be developed in the not-too-distant future. When they are, the first one should be radio operated and contain many recording meters to determine the conditions a future passenger may encounter.

Sylvania is proud of the part played by Sylvania research men and tubes in this development. The complete radar unit was built in the Sylvania Research Laboratory but required modification to adjust time intervals, etc. to suit it to the moon experiment.

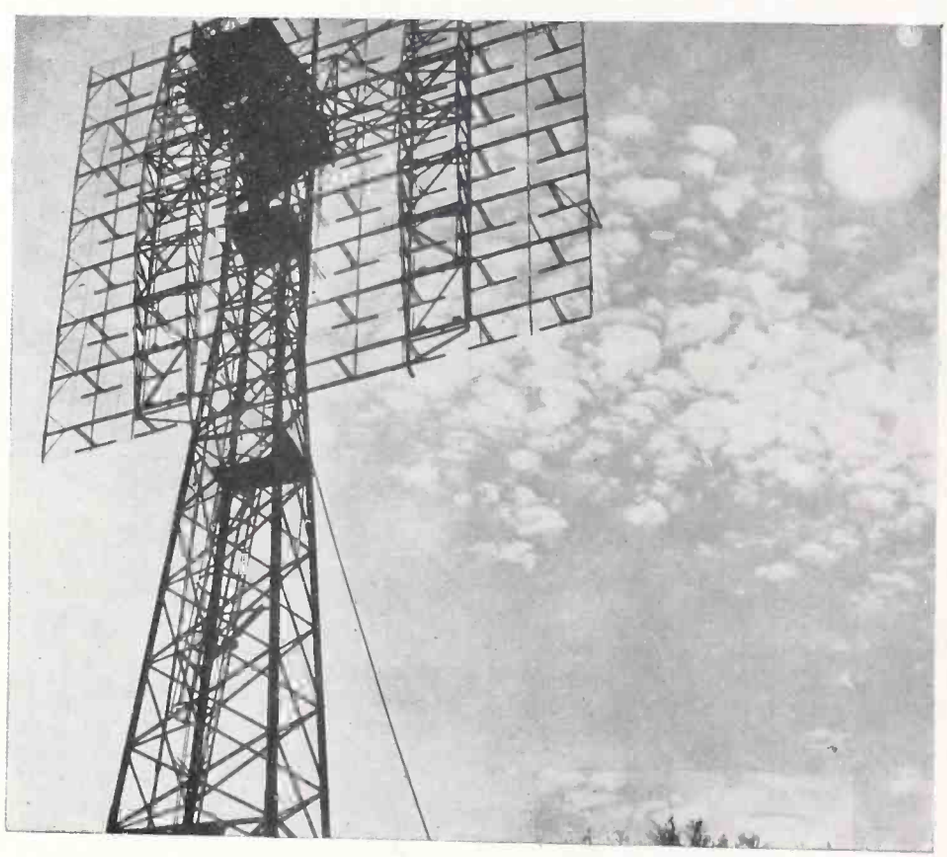
The Receiver

Experimenters and servicemen will be interested in some of the technical details of this equipment. Those in locations which give trouble with background noise at a sensitivity of 5 microvolts will be astonished to hear that the sensitivity of the receiver was 0.01 microvolts. To obtain this sensitivity special precautions were necessary particularly at the high frequency employed which was 111.6 megocycles. A quadruple superheterodyne was used having a tuned RF stage followed by I.F. amplifiers of 32.6, 6.7, 1.5 mc and 180 cycles. The effect of background noise was greatly reduced by the use of the tuned IF stage at 180 cycles. (The background noise depends on the band width received, and the band width obtained at an IF of 180 cycles is approximately 50 cycles.) Due to the Doppler effect and the fact that there is a relative motion of several hundred miles per hour between the transmitter and the moon the frequency of the received echo was not the same as the transmitted signal. The difference may be as great as 300 cycles at this transmitter frequency, and because of the narrow band received the heterodyne frequency has to be correctly adjusted for the relative velocity of the earth's surface and the moon at the time the experiment is made.

The Doppler effect is the name given to the noticable change in the pitch heard at the instant a whistling train passes. When a sounding body approaches, you receive more waves per second than are sent; and from a receding body you receive less per second. The change as the sounding body passes causes a sharp drop in the pitch of the sound. Radio waves behave in a similar way and this same effect was used in the design of the V.T. Fuse.

The time interval between the transmission of a signal and the reception of the echo was about 2.5 seconds which corresponds to a distance of 238,000 miles, the moon's distance from the earth. This DX record will probably stand for a few years. The transmitted pulses were ¼ second long and about 4 seconds apart.

(*Continued on page 15*)



RESISTANCE COUPLED AMPLIFIER DATA

Zero Bias Operation

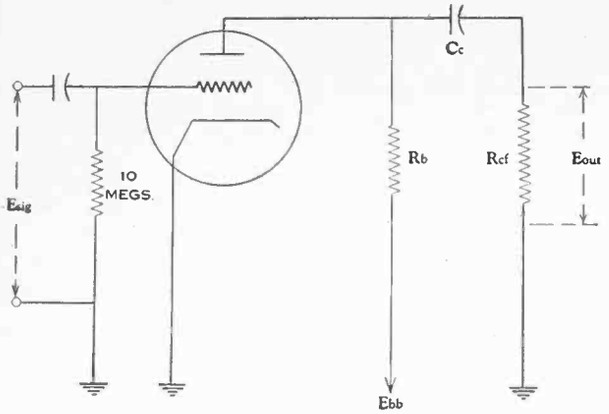
	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.27			0.47		0.1		0.27			0.47	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ib	0.228	0.228	0.132	0.132	0.132	0.09	0.09	1.0	1.0	0.52	0.52	0.52	0.34	0.34
Ec	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eb	77.2	77.2	64.4	64.4	64.4	57.7	57.7	150	150	110	110	110	90	90
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	3.3	3.55	3.95	4.48	5.05	4.63	5.4	4.63	5.0	5.6	6.1	6.7	6.43	7.15
Gain	33.0	35.5	39.5	44.8	50.5	46.3	54.0	46.3	50.0	56.0	61.0	67.0	64.3	71.5
% Dist.	3.0	2.9	3.8	3.2	2.6	3.6	2.6	0.8	0.7	0.9	0.8	0.7	0.8	0.7
Esig (1)	0.15	0.16	0.12	0.14	0.17	0.13	0.17	0.55	0.6	0.5	0.57	0.65	0.5	0.6
Eout	4.73	5.4	4.65	6.12	8.3	5.9	8.8	23.4	26.6	25.5	31.8	39.0	29.5	39.5
Gain	31.5	33.8	38.7	43.8	49.0	45.4	51.7	42.5	44.5	51.0	56.0	60.0	59.0	66.0
% Dist.	4.9	5.0	4.9	4.8	5.0	5.0	5.0	4.7	4.9	5.0	4.9	4.9	5.0	5.0

Note (1) Maximum Signal for 5.0% Distortion

Self Bias Operation

	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.27			0.47		0.1		0.27			0.47	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	3900	3900	5600	6800	6800	8200	10,000	1800	1800	2700	3300	3900	3900	4700
Ib	0.214	0.214	0.138	0.126	0.126	0.095	0.086	0.725	0.725	0.43	0.395	0.365	0.288	0.261
Ec	-0.835	-0.835	-0.774	-0.857	-0.857	-0.78	-0.86	-1.31	-1.31	-1.16	-1.30	-1.42	-1.12	-1.25
Eb	78.6	78.6	62.8	66.0	66.0	55.3	59.6	177.5	177.5	134	143.5	151.5	114.5	124.5
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	3.3	3.5	4.1	4.5	5.0	4.9	5.2	4.37	4.78	5.50	5.92	6.13	6.24	6.75
Gain	33.0	35.0	41.0	45.0	50.0	49.0	52.0	43.7	47.8	55.0	59.2	61.3	62.4	67.5
% Dist.	2.7	2.6	3.2	3.0	2.5	3.1	2.6	0.8	0.7	0.8	0.8	0.7	0.8	0.7
Esig (1)	0.16	0.16	0.10	0.17	0.17	0.12	0.19	0.55	0.55	0.40	0.53	0.61	0.40	0.53
Eout	5.15	5.5	4.1	7.3	8.2	5.75	9.7	23.9	26.0	21.8	31.2	37.0	25.0	36.0
Gain	32.2	34.4	41.0	43.0	48.1	48.0	51.0	43.5	47.4	54.5	59.0	60.6	62.4	67.5
% Dist.	4.5	4.0	3.2	5.0	4.5	4.0	5.0	4.5	4.0	3.3	4.0	4.5	3.3	3.8

Note (1) For self bias operation this is taken at the grid current point with less than 1/8 Microampere grid current.



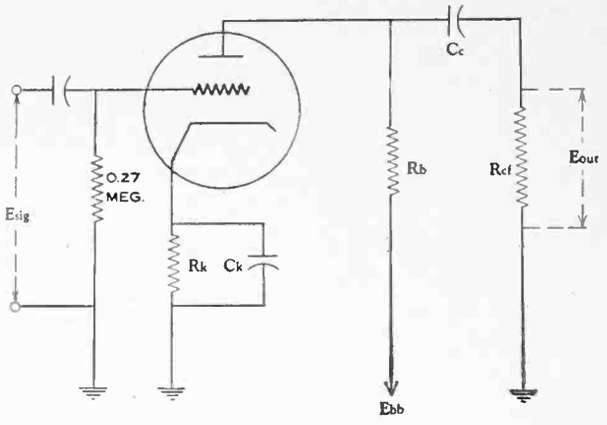
Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

For low frequency limit = f_1 $Ck = \frac{1.6 \times 10^6}{f_1 \, Rk}$ mfd.

$Cc = \frac{1.6 \times 10^6}{f_1 \, Rcf}$ mfd.

SYMBOLS USED

Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms
Rc	Grid Resistor	Megohms
Rcf	Grid Resistor of following tube	Megohms
Rk	Cathode Bias Resistor	Ohms
Ebb	Plate Supply Voltage	Volts
Eb	Palte Voltage at Plate	Volts
Ec	Grid to Cathode Voltage	Volts
Esig	Input Signal	R-M-S Volts
Eout	Output to following grid	R-M-S Volts
Ib	Plate Current	Ma.
Ck	Cathode By-Pass Condenser	mfd.
Cc	Coupling Condenser	mfd.



Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.

MOON RADAR (*Continued*)

Lock-In Tubes Used

Practically all the tubes used in the receivers are Lock-Ins. The R.F. amplifier, and the first converter are Sylvania type 7AB7's but the next two converters are type 7Q7's. Types 7W7 and 7A7 are used as IF amplifiers, type 7H7's in the heterodyne amplifiers and type 7C5 in the audio IF with a type 7A6 as the final mixer. No oscillator is required in the receiver as the frequencies required are obtained by amplification of the desired multiplied frequency from the transmitter. This procedure permits the receiver to keep in synchronism with the transmitter which is absolutely necessary since an accuracy of 50 cycles in 111.6 mc is not obtainable even with the best crystals and thermostatic control. Success depended on having less than 50 cycles change in the time required for the signal to return.

The Transmitter

The transmitter also used a large number of Lock-In tubes. Type 7H7's were used as the crystal controlled oscillators, frequency doublers and triplers right up to the type 7C5 which drives a type 807 tripler. This in turn drives a pair of type 257B's which drive a pair of 450TH's which drive the final pair of type 6C21's. The last three types mentioned are not Sylvania types.

The total power input to the final stage was 800 watts, approximately half of which was radiated by the antenna. By using a larger radar antenna than usual, a concentrated beam was directed at the moon to give an effective power gain of about 200. The antenna itself was built on a 100 ft tower, but since the usual radar direction mechanism was used contact could only be made with the moon when it was close to the horizon.

According to the calculations made by the Mathematical Analysis Section of the Signal Corps the moon re-radiated only 3 watts and since this was scattered in all directions it can be seen that a very small transmitter with a directive antenna would be adequate for use on a rocket to communicate with its home station.

Future Uses

One large communication company is seriously considering the use of this system for long distance code transmission and it has been suggested for television broadcasting. There would seem to be a good possibility for use in the first but its big draw backs are, the large amount of power required, and the fact that it could be used only when the moon was visible to both stations. Its use in television broadcast relaying would not seem to be practicable with our present knowledge because of the above objections and the fact that television requires a very broad band.

NEW ELECTROLYTIC CONDENSERS MAY PRESENT A SERVICE PROBLEM

We believe servicemen will be interested in the following as it may affect their servicing of the newer sets as well as in the replacement of older filter condensers by units of more modern design.

During the war, some advances were made in the design and manufacture of electrolytic condensers which permit larger capacitances to be obtained in the same size can. In some cases, this may permit a set manufacturer to use a resistance capacity filter or a receiver to have lower hum output than the corresponding pre-war receiver. There is possiblity of damaging the rectifier tube if too large a condenser is used without compensating changes to prevent overload. The tube being the part which shows the effect of an overload first is quite likely to be blamed unjustly in case of failure. Many servicemen keep a few "weak" rectifiers handy on the bench to use when checking sets suspected of having filter trouble, or to reform newly installed filter condensers. This is good practice, particularly with new condensers because the quality rating of an electrolytic condenser is given in terms of "milliamperes leakage current per microfarad". After standing idle for some time this momentary large leakage plus the usual high charging current may be greater than the rectifier can supply. The way design engineers overcome this is by the addition of a small series resistance in the lead to the plate, 15 ohms is a probable value. Manufacturing tolerances on condensers are quite wide so that a 10 mfd unit may even be as high as 24 mfd.

Servicemen should observe the following precautions to avoid early rectifier failures.

(1) Don't remove or short out a small series resistance in the rectifier plate circuit to get a little higher volume.

(2) When using a larger than original equipment filter condenser add resistance in series with the plate.

(3) Preform replacement condensers or use "weak" tubes as mentioned above.

DOUBLE ETCH TO BE DROPPED ON MANY TYPES

Double Etched Types: Starting early this year, Sylvania will simplify a number of our tube types by removing the double brand. The types selected and the new etchings are as follows:

Old Etch	New Etch
OB3/VR90	OB3
OC3/VR105	OC3
OD3/VR150	OD3
1B5/25S	1B5
1R4/1294	1R4
3B7/1291	3B7
3D6/1299	3D6
6U5/6G5	6U5
7AB7/1204	7AB7
7C4/1203A	7C4
7E5/1201	7E5
7G7/1232	7G7
7G8/1206	7G8
7X7/XXFM	7X7
14A7/12B7	14A7

It may be some time, of course, before tubes now in process and in dealer's stocks are exhausted. This change does not indicate any alteration in characteristics or quality.

We should mention also that starting with the last revision of the Characteristics Chart we are, by agreement with the rest of the industry, dropping the final /G on types such as 12SK7GT/G. We believe that by now all servicemen should know that the GT types will replace the larger G tubes.

The Service Exchange

Hum In Midwest Model 82. If hum is still present after checking all the tubes and circuits try turning the volume control down to where only hum is audible and wiggle the Type 6SF5GT back and forth in its socket. I have found that a poor socket connection will cause this trouble. C. M. Stone, Bradford, Pennsylvania.

* * *

Chevrolet Model 600565 Dead Set. There are three common sources for this type of trouble in this set (1) Look for a broken yellow wire in the speaker cable; (2) Poor contact in the speaker plug; (3) The insulation strip under the small cover on top of the power transformer has a habit of breaking and allowing the two wires to short to the top cover. Russell Gerow, Lincoln, Washington.

* * *

To Save Power Transformers. To prevent rectifier tube failure, and also the power transformer from overload, a 30 ohm resistor can be used in series with the plates of a Type 25Z5 tube or one of similar type, and in the case of a set using a power transformer be used in series with the B—. The resistor should be of a ⅓ watt rating. In case of too much current drain, the resistor will burn out preventing power transformer failure. Charles Sandberg, Brooklyn 7, New York.

* * *

Zenith Models 8S647 - 8S661. Dead on broadcast band and push buttons. Set operative on short wave bands.

Loop loading coil (part S9589) found to be open. Larry Kaczmarczyk, Mahoney City, Pennsylvania.

* * *

Silver Marshall 37. Quality, especially at low volume levels, can be considerably improved by the following changes:

(1) Change the cathode bias resistor on the 27 detector from 25K to 150K as recommended in the "Sylvania Tube Manual" bias resistor table.

(2) Add a 10K ½ watt resistor in series with the Type 27 detector plate circuit, between the plate and the primary of the push-pull input transformer. This acts, in conjunction with the 100 mmf. mica capacitor, as an RF filter and improves the linearity of the plate load.—Melvin C. Sprinkle, Washington 16, D. C.

* * *

Majestic (Grigsby-Grunow) 130. A common complaint is fading on local stations, which is caused by defective 0.04 mfd. capacitors across the 500 ohm resistors in the band-pass coupling network. These capacitors are three in number and are located under the tuning capacitor gang. They are made easily accessible by removing the coil and tuning capacitor gang sub-assembly. This is easily accomplished by removal of some 10-12 screws and unsoldering about three plate circuit leads. Removal of the assembly also facilitates straightening of the variable capacitor plates which usually wipe against each other due to warping or "growth" of the white metal supports—Melvin C. Sprinkle, Washington 16, D. C.

* * *

Repairing Diecast Phono Pick-up Arms:

1st. Remove the wire, shielding, pick-up cartridge and needle holder.
2nd. Remove the paint and clean metal for copper plating.
3rd. Give broken parts a heavy coat of copper plating.
4th. Solder parts together, file excess solder from the top and refinish with a coat of Ruf Coat or some similar finish.

I have used this method of repairing on several jobs, and to this date, none of them have broken down in service.—Ward G. Dunnican, Clifton, New Jersey.

* * *

Finding intermittent Tubes: In these sets using a string of tubes in series such as 50L6 and 12SQ7 etc., it is often quite difficult to locate which tube has the intermittent filament when the set keeps flashing on and off. The method which I have used very successfully and which I know is not known to other service men in general, is to connect either a cathode ray oscilloscope, an AC voltmeter or a neon lamp across the filaments of the suspected tubes. A voltmeter should be put on the range of voltage greater than 120 volts so that when the tube opens up, the voltage appearing across the tube filament terminals will not burn out the meter. If the tube opens up when the meter is connected across the terminals, the voltage jumps up to almost the full line voltage. By moving from tube to tube, it is possible to locate the intermittent tube in a matter of minutes whereas by removing the tubes from the receiver and testing them out individually, it may take an hour or more to locate the defective tube. I personally prefer to use the oscilloscope myself for the reason that it is so much quicker in its response than a meter and the slightest opening of the filament is immediately apparent on the scope.—Donald Slattery, Chadron, Nebraska.

* * *

Distortion in Output Stage: 43-50L6 type tubes, etc., when ageing develop positive grids that spoil tone and ruin quality. The usual method of salvaging these tubes is shunting the regular grid resistor, usually 500,000 ohms with another of about 100M ohms. This reduces volume and the tube still has some positive grid condition. A better method, where space permits is to use the secondary of a small audio transformer, which usually has a D.C. resistance of 2M to 5M ohms; this can be new or used, most shops have old sets around with several of these which can be salvaged and the grid condition is reduced to practically no voltage, D.C., but the impedance is as good as or better than the original resistor, which may be left in circuit.—David V. Chambers, Upper Darby, Pa.

PATIENCE

If patience is a virtue then, indeed, Sylvania radio servicemen and dealers are a virtuous lot because they have been very patient with us on the delivery of advertising orders.

Never before in the history of our company have we received so many advertising orders and never before has it been so difficult to obtain the materials to fill these orders.

As we all realize there are critical shortages in paper and fabrics which very directly affect our advertising and promotion items.

All orders for imprinted material —job record cards, letterheads, envelopes, postal cards, etc. are being given our very best possible attention. The volume, however is so great that where previously we were able to do all of this imprinting in our own shop, better than 60% of it is now being handled by outside printers.

The situation on Sylvania Service Kits is, indeed, bad. Plywood is not available except for essential building purposes at the present time. Rather than use a substitute wood or fibre which would not provide the durability of plywood, we believe it advisable to hold up all orders for Service Kits until the regular high quality Sylvania Service Kit can again be made available; probably in the last quarter of this year.

There is also a delay in shipment of Service Coats, Jackets and Aprons—this due, of course, to the fabric shortage (have you tried to buy a suit lately?)

We do, however, receive small shipments of coats and jackets from time to time, which garments are immediately shipped against held orders.

We want to take this opportunity of expressing our appreciation to our serviceman and dealer customers and to our distributors too for their patience and understanding of these problems. We also want to assure you that we are doing and will do everything possible to give you the very best service on your orders—**Don't Stop Sending Orders—** just allow a little more time than usual for delivery.

SERVICE IS GOOD BUSINESS *(Continued)*

. . . . What It Did For Radio Specialties

The above is a picture of a new store that will house an old-line radio distributor. The name is Radio Specialties located at 456 Charlotte Street, Detroit, Mich. There is nothing unusual about new stores today, but pictured is an unusually attractive and "rich looking" store front. It is one of the largest radio shops for radiomen in Detroit. Don Norton and Carl Poosch have given their best in service to their radio buying trade enabling the company to attain the highest order of success as wholesalers of radio specialties. Excellent service to radio servicemen has built this new home. The shop front is a monument to their friendly and efficient operation over the years.

In Business For 17 Years

Radio Specialties is a partnership between Mr. Norton and Mr. Poosch. They first opened their doors to the radio trade in a small store on Jefferson Avenue back in February 1929. In those days they had only one employee, Mollie Williams, who is still with the company and is now credit manager.

Today they employ over twenty people having enlarged the business to six times its original size.

They have been in business for 17 years and through the medium of spontaneous and efficient service to radiomen of Detroit have grown into a large, alert organization that knows how to retain small store friendliness. Reputable service has been the key to their success. A part of that service has been the distribution of Sylvania Radio tubes for the past 13 years.

WHAT NEXT

Another Production Problem "Horns In" On Reconversion

Sylvania's plant in Warren, Pa. turns out radio tube parts. Sometimes it "turns out" large buck deer.

This is the story they tell down in Warren.

A deer broke into the plant through the employee's entrance, made his way through a corridor and ultimately into the main plant. It could have been the devil himself (it had horns too) for the commotion he caused. Work was disrupted for the rest of the day.

The deer found his way into the drafting room and smashed all the tables. He didn't want to get drafted. Eventually, he tired of deviltry, went into a back room and lay down.

From whence he was given the bum's rush.

There are strikes in supplier plants, floods, lack of materials and transportation difficulties holding up production the country over. The deer is Sylvania's own unique contribution to the reconversion problem.

NEW PRICE SCHEDULE

Lists Obsolete And Current Tubes

As a service to Sylvania customers, we have prepared a comprehensive Retail Price List of radio receiving tubes. A copy is enclosed with this issue of the Sylvania News.

Our purpose has been to provide a listing as nearly complete as possible so that it will serve as a convenient pricing guide not only for the commonly required tubes, but also for a miscellaneous variety of less frequently used types. Although a number of the types listed are considered obsolete and will never be manufactured again, we have included them for the convenience of dealers and service men who occasionally make replacements from stocks which they still have. On the opposite extreme, we have listed several new types for which no renewal demand has yet developed. Some of these new types are not in production, but it is expected that they will be released for replacement sale this year.

You may secure extra copies of this Retail Price List from your Sylvania Distributor.

R.W. ANDREWS APPOINTED MERCHANDISING MGR.

Raymond W. Andrews, former Commander in the Navy, has been appointed Merchandising Manager of the Radio Division of Sylvania Electric Products Inc. His office at present is in Williamsport, Pennsylvania. He will specialize in the development and sale of special products to be marketed through radio parts distributors.

During the war he was officer in charge of the distribution of all fire control radar equipment for the Bureau of Ordnance from April, 1942, to July, 1944. Between July, 1944, and November, 1945, he was officer in Charge of a Bureau of Ordnance special unit producing radar control units.

His activities in the radio and electronic fields for twenty years have included sales, production, and technical service for wholesalers, retailers and manufacturers.

SYLVANIA'S BELGIAN ENVOY

Brussels Office of Sylvania's Belgian Representation

Below is a photograph showing the Sylvania sales room and office of Andre P. Closset at No. 1, Quai des Peniches, Brussels.

M. Closset has been the Sylvania representative in Belgium for fifteen years. He set up the first display of Sylvania products on the Continent.

MORE FOR YOUR RADIO SERVICE AND SALES PROMOTION MONEY

Your customer wants to know what can happen to his radio. Folder #120 ("What's Wrong With Your Radio") will tell him! It opens to a picture of a radio chassis with indicators locating possible breakdowns.

Imprinted:

100	$1.00
250	$1.75
500	$3.00
1000	$5.00

Folder #127, "Do You Know How To Clean Your Radio," lists methods of cleaning and four notes of caution to observe during the process. On the back is a place for YOUR phone number, for the housewife's convenience should her set get out of order. Folder #127 can be strung on the plug-in wire of any radio.

Imprinted:

100	$1.50
250	$3.00
500	$5.50

Order from your Sylvania Distributor.

SYLVANIA SALES SET NEW HIGH, $126,792,723

(*Continued*)

hardship was shortage of materials and parts, caused largely by the confused pricing situation. Labor shortage, threatening strikes and continued pricing difficulties made the short-term outlook discouraging as the new year began. The inability of our suppliers to take care of our needs presented the greatest problem."

The report points out that the company's business in fluorescent fixtures and electronic devices.. relatively small in dollar volume up to the beginning of the war..shows promise of a rapid rate of growth. Use of fluorescent lighting, it is explained, is still in its infancy, and engineers are only beginning to apply electronic principles to the problems of industry.

The number of common stockholders of Sylvania Electric Products Inc., increased in 1945 to 6,872 compared with the 5,908 holding stock at the beginning of year.

F. M. FUTURE DISCUSSED

Frank Mansfield of Sylvania Explains Reason for Delay

Leonard L. Asch, president of FM station WBCA, Schenectady, New York, predicted that in two years FM will completely replace standard radio except for rural areas which will be served by high-powered standard transmitters. He admitted that in New York City, with its high-powered stations, FM "can't do much" for the present. But, he added, it will give the country beyond the Hudson River good reception for the first time.

Within six months, he continued, 25 per cent of the people outside the New York area will use FM; in a year it will be "fifty-fifty"; in a year and a half, 75 per cent will have FM, and in two years you can kiss standard radio good by.

Frank W. Mansfield, director of sales research of Sylvania Electric Products Inc., while conceding that a majority of the public will have FM in two or three years, said that set production has been held up to a "marked degree" by the necessity of moving to a higher frequency as required by the Federal Communications Commission. He added that FM had been set back six years by the war.

He said that 36 per cent of the users of FM complain of static, but added that interference is "much less" than on standard broadcasting. However, he went on, FM sets do not stay in tune as well as regular receivers without an automatic frequency control attachment which adds to the cost.

RADIOMEN IGNORE STRIKES TO ATTEND CHICAGO SHOW

Spirits undampened by the impending R. R. strikes, radio manufacturers, distributors, representatives, and members of the trade journeyed to Chicago for the first parts show since 1941.

Show registration totaled almost 8,000 radiomen from every state in the nation and 1,800 tradesmen attended the Keynote Dinner held Monday evening at the Stevens Hotel.

Highlighting this dinner was the opening statement by H. W. Clough, president of the show group, "In the history of merchandising there has never been a challenge such as there is today."

At a special meeting on Sunday preceding the show an election of N.E.D.A. officers was held with William O. Schoning, Lukko Sales, Chicago, being re-elected president.

Backstage during entire show session were twenty of the top executives from the Sales and Advertising Departments of Sylvania Electric Products Corporation.

BACKSTAGE

Behind the scenes in Sales and Advertising at Sylvania is the alert team of men pictured above. Occasion was the recent Radio Parts Trade Show held at the Hotel Stevens in Chicago, Illinois. Reading from left to right, front row: Henry C. L. Johnson, Advertising Manager, Radio, International, Electronics Divisions; Paul S. Ellison, Director of Public Relations; C. W. Shaw, General Sales Manager; R. P. Almy, Ass't. General Sales Manager; H. H. Rainier, Manager, Distributor Sales; George C. Connor, Sales Manager, Electronics Division. Second row: R. F. Henderson, Manager Central Division; M. R. Carson, Manager, Southwestern Division; D. C. Patrick, Manager, Western Division; G. R. Wannen, Manager, Eastern Division; R. W. Andrews, Merchandising Manager; C. W. Chapman, Sales Representative, Southeastern Division. Third Row: J. T. Fulwiler, Sales Representative, Southeastern Division; J. T. Mallen, Manager, East Central Division; C. T. Clark, Manager, Northwestern Division; S. J. McDonald, Salesman, Northeastern Division; John Hauser, Sales Supervisor; W. G. Patterson, Manager, California Division; G. C. Isham, Manager, Northeastern Division. H. G. Kronenwetter, Manager, Advertising Production snapped the Photo.

RADIO OWNERSHIP INCREASES

The number of "radio homes" has increased 17.9% over the past five years, according to figures released by the Bureau of Census in its Monthly Report of the Labor Force for November 1945. This increase brings the number of radio homes up to nearly thirty-four million and does not include any additions since the end of last year.

The Broadcast Measurement Bureau, in interpreting these figures, relates that Massachusetts leads all states in per cent of radio ownership with 97.9. Rhode Island, New York, Connecticut and New Jersey trail slightly with ownership of 97.5% or better in all cases. The greatest percentage increase, however, occurred in rural non-farm homes with a gain of 19.4% followed by urban homes with 18.4% and farm homes with 13.2%.

Answers to the Census Bureau questionnaire also showed that 18.5 million homes had extra radio sets. Nine million automobiles are equipped with radio receivers and the estimated total number of radio receivers in the U. S. is sixty million.

4,301,000 Homes Without Radios

"Wired homes" are a prerequisite for the use of plug-in radio sets and are necessary for the existence or creation of a large radio and radio repair market, according to a Sylvania survey.

Of these 30,862,000 had radios and 1,702,000 did not. That leaves 4,628.000 homes with no facilities for plug-ins. Yet there are only 2,598,000 without a radio set. 2,030,000 homes have battery or portable sets. The report statistically concludes that there are 4,301,000 homes without a radio compared to the 32,892,000 homes with. And consider, that in each of these homes, a radio would be appreciated in the kitchen, bedroom and playroom as well as in the living room.

36.6% of the nations' occupied homes are in the country and 20.2% of them have no radios.

U. S. S. SYLVANIA AGAIN

Some months ago we ran a story about the U.S.S. Sylvania, a combat-cargo vessel which was commissioned at Providence, Rhode Island, and was named after a planet. Sylvania employees, taking an interest in a Navy ship that bore the same name as their company, presented the crew with a radio-phonograph set.

Recently we have heard about the U.S.S. Sylvania again and learned about the part it played in the war. This report was based on the ship's log and other sources. The Sylvania entered the war at a late date and for that reason had little or no opportunity to engage in any spectacular activity.

The vessel was launched on April 26th, 1945 and was commissioned on May 19th. Following her shakedown cruise, the Sylvania was ordered to Marseilles, France, leaving Norfolk, Virginia on June 21st, 1945. After her return she reported for duty under the command of Naval Transport Service. Early August found her enroute to Eniwetok in the Marshall Islands where she arrived on August 17th, two days after the Japanese capitulated.

Early in September, the Sylvania, while in the Philippine area, reported for duty to the Commander, Fifth Amphibious Force and Commander, Amphibious Forces, Pacific Fleet. At that time she was assigned as a unit of Transport Division 56, Transport Squadron 14, Amphibious Group 8.

Later in September, the Sylvania participated in the occupation of the Wakayama area, Honshu, Japan. She made an unopposed amphibious landing with the other units of Transport Division 56, landing troops, supplies and equipment for the Sixth U. S. Army. Her cargo included vehicles, cranes, heavy lifts, and a variety of miscellaneous bulk cargo. Although smoke making facilities were tested and other precautions were taken enroute, operations proceeded according to plan and were uneventful. This was the Sylvania's first amphibious operation.

The Sylvania made two additional trips to Japan in the Fall of 1945 and subsequently visited Guam and Saipan and returned to San Francisco on November 14th. During the later part of November and December, she saw "Magic Carpet" duty, bringing discharged Army and Navy veterans back to the United States.

The Sylvania is currently earmarked for duty with the Navy's First Fleet (Pacific Waters.)

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A

Your Copy of
SYLVANIA NEWS
MAY-JUNE, 1946

Vol. 13 . . No. 4

Published By
SYLVANIA ELECTRIC PRODUCTS INC.
Manufacturers of Sylvania Radio Tubes and Electronic Devices, Sylvania Incandescent Lamp Bulbs, Fluorescent Lamps and Equipment.

A. V. BALDWIN . . . . . Associate Technical Editor

SYLVANIA NEWS

JULY, 1946 EMPORIUM, PENNA. VOL. 13, NO. 5

In This Issue:

E. GALLOWAY

COMMENTS . . . .

By BOB ALMY

Radio Tube Deliveries

The latest figures available, although incomplete, indicate that radio set production for the first half of this year is approximately 5,500,000 sets. June production is estimated at over 1,000,000 sets and probably exceeds the 1941 prewar average of 1,100,000 monthly. Of the June production more than 750,000 sets were table model types. Auto radios were approximately 60,000. About 17,000 FM sets were produced. Television set production so far this year has been limited largely to show models.

Radio Set Production

Radio servicemen will be interested in comparing their own experience with the results of Sylvania Surveys which are made on a national basis. This month's issue of Sylvania News reports some figures regarding consumer buying habits which clearly indicate that the majority prefer to purchase radio tubes from the radio repairman.

Sylvania Surveys

We feel obligated to discuss tube deliveries as long as a shortage exists. Last month we indicated that various factors would combine to create new shortages in replacement tubes. We are currently manufacturing several of the older replacement types, such as 24A, 26, 30, 6A7, 80, etc. At frequent intervals we change our schedules to provide other types, when we find the demand is temporarily satisfied. Thus, we will gradually catch up on the types in this group. Of the types required for original equipment by set manufacturers, many are the same types which have a large replacement demand, such as the AC-DC group. Others are newer types for which the replacement demand is limited and which will develop later.

On an overall basis we predict that there will be fewer tubes available for repair use during the balance of the year than during the past few months, the shortages occurring in the types being used by the set manufacturers.

18,000,000 Home Radio Market

In the March-April issue of the SYLVANIA NEWS, we reported that the home-radio market will be able to absorb eighteen million sets before the market becomes saturated. As such material is interesting and useful to the radio serviceman in judging radio market trends, we ran the report in detail. Below is the second part of the report.

The influence exerted by the various members of the family has a distinct bearing on the type set preferred.

Also in the number of people who are present at time of purchase.

	Total number of people present at time of purchase	Husband	Wife	Husband and Wife	Son or Daughter	Friend and Relation	Gift
		% of times a certain person is present					
Midget	1.435	54.0	26.5	9.5	8.0	12.0	24.0
Table Model	1.400	54.0	26.5	9.5	12.0	9.5	19.0
Console	1.735	66.0	40.0	21.0	8.0	7.0	10.5
Combination	1.855	67.5	40.0	25.0	15.0	5.0	8.0
Portable	1.265	51.0	19.5	6.0	16.5	11.0	16.5
Total	1.545	59.0	32.0	14.5	10.5	8.5	15.5

The number of persons present increases as the value of the set increases.

Reasons for selecting a particular set (brand, color, etc.) instead of some other set of the same generic type.

	Midget	Table	Console	Combination Table and Console
Tone	80.2%	75.6%	77.6%	76.0%
Price	80.2	71.2	55.6	47.2
Appearance	52.0	45.5	56.4	62.0
Style and color	21.5	16.4	26.7	28.0
Design	20.6	18.5	15.4	20.4
Color	1.6	3.0	2.7	1.8
Appearance of Cabinet	8.3	7.6	11.1	12.0
Brand	34.7	51.5	53.9	49.5
Number Tubes	8.3	10.8	15.3	15.5
Short Wave	.8	6.2	10.5	7.8
Push Buttons	3.3	5.4	9.4	10.0
Dial	.8	2.6	3.1	.6
Trade-in Allowance	—	1.2	3.4	1.2
Other	11.6	72	2.2	10.8

(*Continued on page 19-G*)

10 Million Families Interested In Television

9,603,000 urban families expressed the desire to spend $2,416,446,000 for home television sets in the next four or five years providing telecast facilities will be available. These facts have been accumulated by the Sales Research Department of Sylvania Electric Products, Inc. 26.6% of the nearly 10 million families interviewed definitely plan to buy a television set and 18.5% are considering the purchase of one. The report was based on the answers of radio listeners, 28% of whom are now located within the range of a television transmitter. Only 16.7% have ever seen a set in operation.

The larger market, numerically speaking, will be in the lower income brackets. 5,069,000 of these families come from the group earning from $1000 to $3000 in normal times as compared to the 773,000 from the top bracket, earning more than $5000 per year in normal times. The degree of interest in television decreases in the lower income brackets but the only significant drop is in the lowest income group (earning less than $1000 in normal times). Also significant is the fact that knowledge of, and experience with television declines rapidly as income decreases. 32.4% of income group A had seen a television demonstration whereas only 9.5% of group D had ever seen a set in action.

(*Continued on page 20-G*)

SYLVANIA NEWS

MERCHANDISING SECTION

JULY, 1946 EMPORIUM, PENNA. VOL. 13, NO. 5

ADVERTISING AND THE RADIO SERVICEMAN

Local Advertising As Important to the Local Dealer As National Advertising to the Large Manufacturer

There are differences that account for one man's failure and another man's success. This is true of advertising. For there is a science to it. Advertising is not inspirational. It takes WORK and PLANNING!

Advertising is a long term proposition. Success lies in realizing that today's investment will not pay off until tomorrow. Innumerable initial expenditures have been wasted because a local dealer reneged on an immature plan when his sales had not skyrocketed immediately.

Furthermore, it is not necessarily expensive. That an advertising campaign of any sort takes a large amount of capital is an erroneous impression. Though a national advertiser may spend thousands of dollars for the space on the back cover of a nationally circulated publication, this does not mean you need give up the idea of keeping in touch with your local consumer. For you can do it with a small percentage of the profits netted from the investment! And you must keep in touch with the actual and potential customers in your area. FOR LOCAL ADVERTISING IS AS IMPORTANT TO THE LOCAL SERVICEMAN AS NATIONAL ADVERTISING IS TO THE NATIONAL MANUFACTURER AND DISTRIBUTOR! Large scale, expensive advertising is not the only kind. If a small businessman's merchandise or service is selective, so then his advertising.

Advertising is the backbone of business! It is the prerequisite to a sale. Yet if an unplanned advertising campaign is undertaken your business will still have no backbone nor will you have the prerequisite to a sale. So for a plan.

First of all, find your prospective customer. Know who he is. That will depend on what you are selling, its quality, and upon the social and economic environment of your consumer. Your product is undoubtedly selective. Your advertising then, should be directed to a particular audience. This will avoid waste circulation and the consequent expense of reaching people that wouldn't or couldn't buy from you anyway. Don't for instance, send lists of high-priced items to the less well-to-do families of your area.

Demand is seasonal. It varies according to the weather, holidays, sports and pastimes of the particular season. Take advantage of such visible trends. Be on the alert for new and seasonal consumer desires.

The most obvious problem for the advertiser is the selection of a a medium through which to conduct his campaign.

Local dealers have frequently reported a high degree of success with ads placed in the classified telephone directory or in the yellow section of the book. Set up your ad with "white space." It makes the ad easy to read and an eye catcher. Make it concise and to the point. The public will only read so much. They're a busy lot.

Perhaps you can print an interesting ad on the back of a blotter. Or make available to your customer such conveniences as pencils or rulers with your name on them.

Book matches are a very practical medium employed today with a high acceptance rate by the public. The drug store near your shop will probably agree to pay you for the matches that will cover a large percentage of the cost. And at the same time you are availing yourself of a different medium in a different section of the city.

A sign where the most people will see it will bring the most business. The local barber shop, the taverns, the bowling alley, are the crossroads of your community. Small signs there will bring your name, as serviceman for the community, before the eyes of the greatest number of people.

Sales literature on drug store and grocery store counters will be picked up by the practical minded housewife. Housewives are that way.

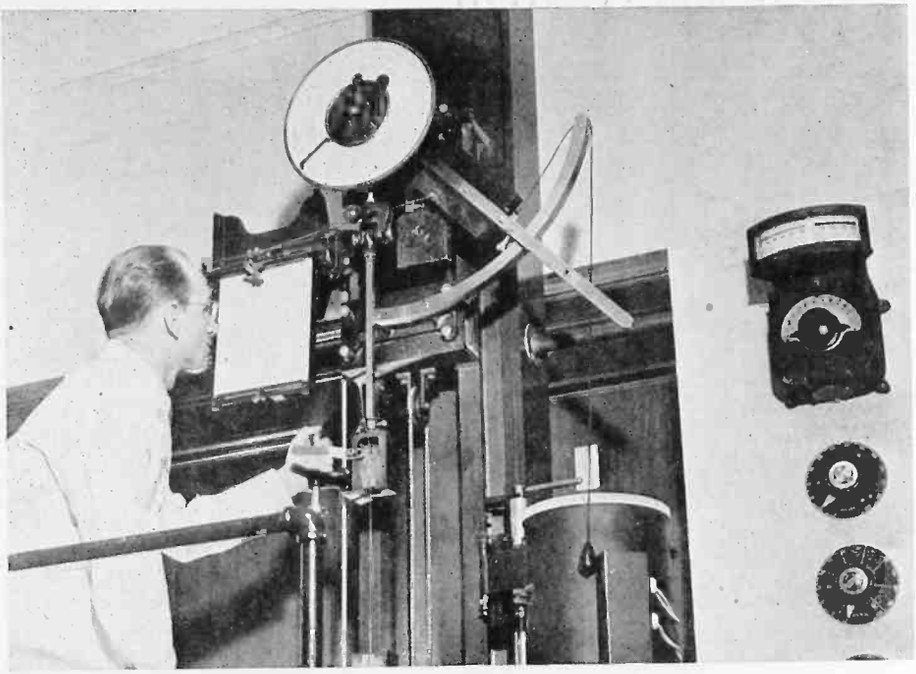
It is also a good idea to keep in touch with your national supplier as to his advertising plans. Most likely he has something already developed by experienced advertising men at less cost to you. It will help sell his products by getting your name, as a distributor of his product, before the public eye. And it will be good business for you to have your name associated with a nationally known brand.

Poster advertising is generally, conducted by the small businessman on local street cars and trolleys. It's the place for institutional advertising employed to prod a buyers market. It is also a good means of announcing sales or the coming of seasonal merchandise. Be sure to place your poster in local vehicles—a local line—for posters circulated two counties away will bring you very little business.

Some small business men have sponsored a local athletic team. A softball or bowling group. There is no great cost for this sort of publicity relative to the returns, particularly if the league competition occupies an important place in community life. Sponsoring of public activities related to your business is a valuable medium for publicity. Perhaps electric wiring is being installed in a rural area near your shop. Associate your

(Continued on page 19-M)

RESEARCH . . . FOR QUALITY "FIRSTS"



The Tensile Test. Gives valuable information as to the physical properties of metals and alloys such as tensile strength, yield stress, elongation, ductility, workability, etc.

Over its forty-five year history Sylvania has stressed research as the most important element of progress. Sylvania has done just that, offering better and better products to the consumer. Forty-five years of research in a bottle and you have a Sylvania radio tube. It has meant a thorough, extensive and original search into the scientific tomorrow. "First" and "quality" are analogous with the name, Sylvania.

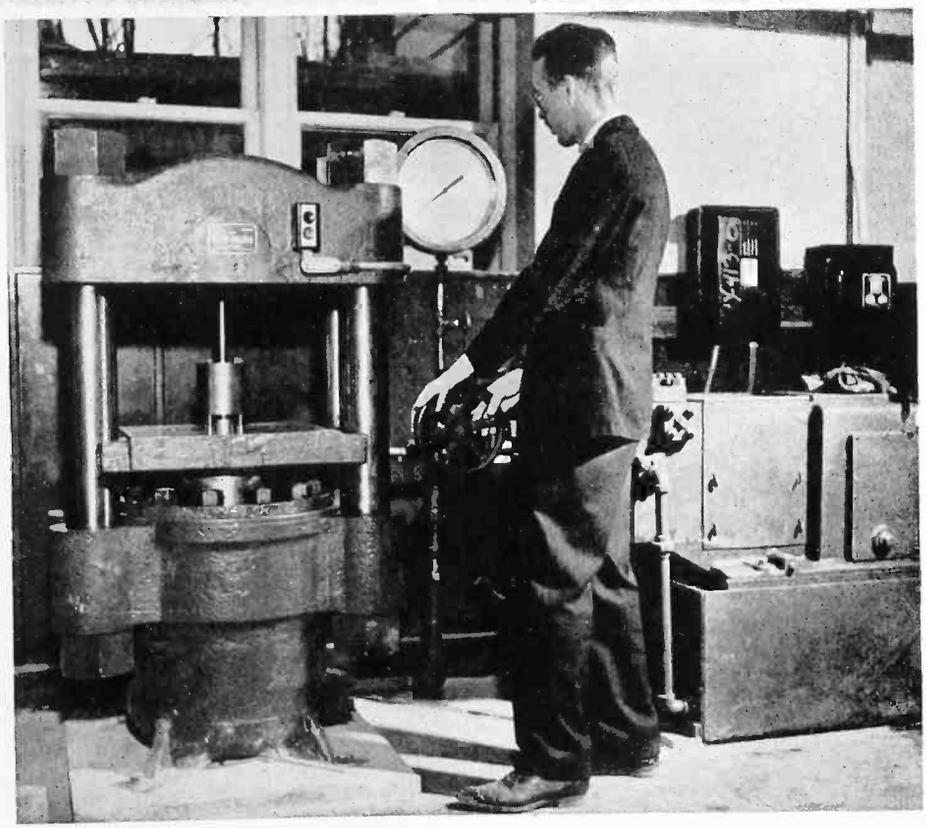
At Sylvania Center in Bayside, Long Island, we maintain a complete metallurgical research and development laboratory. Here metallurgical research engineers, development engineers and technicians study and work with all types of metals and alloys for use in radio tubes, incandescent lamps, parts, and tungsten products, as well as other problems of a metallurgical nature.

New Alloys Developed

In order to obtain metals or alloys having optimum physical properties for each particular use, known alloys are investigated and in cases where no satisfactory materials can be found, Sylvania's metallurgists study and develop new alloys which are capable of giving improved performance. Among the materials being studied in these laboratories are nickel, platinum, aluminum, tungsten tantalum, columbium, iron, copper and their alloys.

One of the important functions of this centralized metallurgical re-research laboratory is to work closely with Sylvania's factories on problems of a metallurgical nature. Thus, their activities are closely coordinated with production problems on tungsten wire, rod and powder; nickel and nickel alloy filament and grid wire; leads, radio tube parts, etc. In this way, the products and knowledge of the metallurgical research section is used to best advantage in the manufacture of superior products.

Research is conducted by experienced technicians with highly delicate and perfectly precise instruments, specifically designed to meet needs peculiar to one job. Many of these tools are developed in Sylvania's own laboratories. An example is the automatic recording dilatometer to measure the thermal expansion of metals and alloys. The accompanying photographs are representative of a few of the tests which are made in these laboratories.



Powder Metallurgy. A powerful hydraulic press is used to form a powdered metal compact. Powder metallurgy is a valuable metallurgical tool in preparing extremely pure metals and alloys for further study.

SYLVANIA NEWS

TECHNICAL SECTION

JULY, 1946 EMPORIUM, PENNA. VOL. 13, NO. 5

CIRCUIT DATA ON ELECTROFLASH UNIT

The following information is published in Sylvania News because the Wabash Photoflash Unit will be a popular photographer's accessary and you servicemen may be called upon to repair them.

We do not recommend this for construction by average servicemen on account of the high voltages used. There are many readers, however, who are radio amateurs or who have been working on high voltage equipment long enough to understand the necessity of being extremely careful when using voltages around 2500 volts. Don't attempt to construct this unless you are sure you are a careful worker and understand the common safety precautions and interlocks used in such work.

The Wabash Corporation (a subsidiary of Sylvania) makes several different models of this Electroflash Unit for different applications and power supplies. The one described here is the 110 volts A.C. portable model which may be the most popular. Sales of these units started early this year but production is still behind the demand as usual in most manufactured items today. The tubes used in this unit are available to our distributors and dealers for replacement purposes. Voltage ratings are given on all components to assist in selecting and testing replacements but components other than tubes will not be available for general distribution for some time. Constructors will need to make their own layout to suit the parts they can obtain having the necessary electrical ratings.

History

Most people have seen feature pictures of moving bullets, breaking lamp bulbs, etc. taken by high speed photography using a stroboscope. The electroflash lamp operates on a similar principle but has sufficient intensity for use with ordinary cameras and is simplified to allow for single snap shots. The stroboscope tubes have been made by Sylvania for years, (types 631P1, SN4) the new tube recently developed, type R4330, is considerably more powerful so as to be suitable for use in place of the standard magnesium flash bulb. A comparison table is shown in tables I and II.

WABASH MODEL R1140 115 VAC ELECTROFLASH

Operation

As shown in Figure 2 the Wabash Photoflash Unit consists of two important parts, the power supply and the flash gun. A connection to the camera for control is also necessary. The power supply consists of a relatively high voltage transformer, two rectifier tubes connected as voltage doublers and a large condenser. The flash gun consists of the tube, a voltage divider unit, ignition coil and switch. The 30 mfd. storage condenser becomes charged to the operating voltage, 2500 volts approximately, but this cannot discharge through the tube until the discharge is initiated by the ignition coil. To start the discharge, condenser C4 is discharged through the primary of the coil to produce a very sharp peak of about 15,000 volts which ionizes the gas and allows the 30 mfd. condenser to discharge almost instantaneously producing a very intense blue-white light. The condenser charges up quickly enough to allow a maximum flashing rate of 6 per minute. Each tube is rated for 10,000 flashes or more so the economy and convenience will be quite apparent.

Safety Features

The safety switch S2 is used to prevent injury to servicemen working on the unit. This shorts the condenser when the unit is taken out of its case for any reason. If this were not provided the condenser might hold a charge for nearly an hour, perhaps longer if the bleeder resistor has been disconnected.

The switch S3 is also connected in the safest manner. Condenser C4 cannot charge while S3 is connected which prevents repetition of the flash until the off period has been long enough for C4 to charge. It is best to allow about 15 seconds between flashes to assure time for the condenser to fully charge. A weak flash or none at all will result otherwise. *(Continued on page 19-T)*

RESISTANCE COUPLED AMPLIFIER DATA

Zero Bias Operation

Sylvania Type 1LH4

	Ebb = 45 VOLTS (See Note 2)									Ebb = 67.5 VOLTS									Ebb = 90 VOLTS								
Rb	0.27			0.47			1.0			0.27			0.47			1.0			0.27			0.47			1.0		
Rcf	0.47	1.0	4.7	1.0	4.7	10.0	2.2	4.7	10.0	0.47	1.0	4.7	1.0	4.7	10.0	2.2	4.7	10.0	0.47	1.0	4.7	1.0	4.7	10.0	2.2	4.7	10.0
Ib	0.0075	0.0075	0.0075	0.0064	0.0064	0.0064	0.005	0.005	0.005	0.03	0.03	0.03	0.0242	0.0242	0.0242	0.0168	0.0168	0.0168	0.071	0.071	0.071	0.053	0.053	0.053	0.032	0.032	0.032
Eb	43	43	43	42	42	42	40	40	40	59.4	59.4	59.4	56.1	56.1	56.1	50.7	50.7	50.7	70.8	70.8	70.8	65.1	65.1	65.1	58.0	58.0	58.0
Esig	.03	.03	.03	.03	.03	.03	.03	.03	.03	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	.168	.200	.234	.270	.336	.350	.405	.465	.490	0.77	0.91	1.03	1.08	1.26	1.29	1.37	1.52	1.60	2.2	2.55	2.8	3.0	3.4	3.5	3.65	3.95	4.05
Gain	5.6	6.7	7.8	9.0	11.2	11.7	13.5	15.5	16.3	15.4	18.2	20.6	21.6	25.2	25.8	27.4	30.4	32.0	22.0	25.5	28.0	30.0	34.0	35.0	36.5	39.5	40.5
% Distortion	5.1	5.0	4.9	4.5	4.2	3.8	3.9	3.7	3.6	3.5	3.3	2.9	3.2	2.9	2.8	2.6	2.3	2.2	2.7	2.4	2.1	2.5	2.1	2.0	2.6	2.3	2.1
Esig (1)	.03	.03	.03	.03	.04	.04	.05	.05	.05	0.07	0.08	0.08	0.08	0.09	0.10	0.09	0.10	0.11	0.17	0.18	0.20	0.17	0.19	0.20	0.16	0.18	0.19
Eout	.168	.200	.234	.270	.445	.465	0.67	0.76	0.81	1.07	1.44	1.63	1.7	2.24	2.50	2.43	2.97	3.45	3.60	4.45	5.40	4.89	6.20	6.65	5.66	6.80	7.45
Gain	5.6	6.7	7.8	9.0	11.1	11.6	13.4	15.2	16.2	15.3	18.0	20.4	21.3	24.9	25.0	27.0	29.7	31.4	21.2	24.7	27.0	28.7	32.6	33.2	35.4	37.8	39.2
% Distortion	5.1	5.0	4.9	4.5	5.2	5.1	5.2	5.0	4.9	4.7	4.7	4.6	4.7	4.5	4.8	4.5	4.5	4.7	4.6	4.3	4.7	4.5	4.5	4.7	4.5	4.65	4.7

Note (1) Maximum signal for 5.0% distortion. Note (2) Operation at Ebb = 45 volts is not recommended. Above 45 volt data is shown only to assist in determining end of life performance with 67.5 volt supply. For 45 volt supply type 1LD5 is recommended.

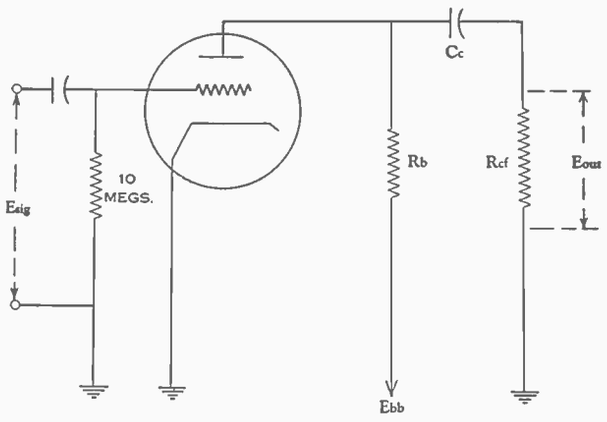
SYMBOLS USED

Symbol	Function	Unit	Symbol	Function	Unit
R_b	Plate Load Resistor	Megohms	E_{sig}	Input Signal	R-M-S Volts
R_{cf}	Grid Resistor of following tube	Megohms	E_{out}	Output to following grid	R-M-S Volts
E_{bb}	Plate Supply Voltage	Volts	I_b	Plate Current	Ma.
E_b	Plate Voltage at plate	Volts	C_c	Coupling Condenser	mfd.

Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

$$\text{For low frequency limit} = f_1 \quad C_c = \frac{1.6 \times 10^6}{f_1 \, R_{cf}} \text{ mfd.}$$

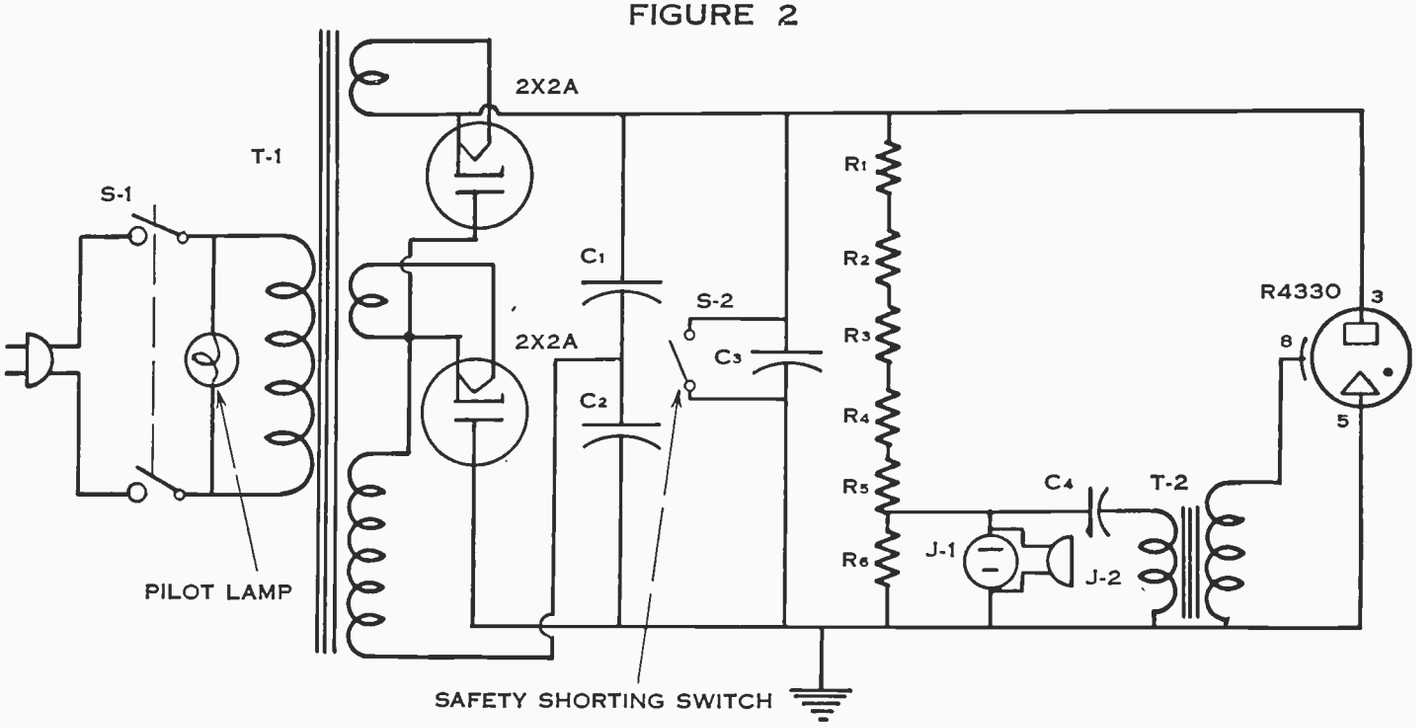
Some text books show a more complicated method for calculating by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.



Sylvania Type 1LH4

ELECTROFLASH WIRING DIAGRAM

FIGURE 2



The bleeder resistors may also be considered as a safety feature. Normally these will discharge the condensers completely if the switch has been kept off for an hour. Home constructors should note, however, that some 2-Meg ½ watt resistors will not stand service at 500 volts across the terminals. This is only ⅛ watt dissipation it is true but the high voltage may cause some of the cheaper grades of resistors to arc over internally. Before replacing a defective resistor it would be a good idea to test it on a 500 volt power supply for a few minutes.

Note the fact that the flash gun assembly cannot be disconnected by pulling out a plug. This feature prevents damage or possible injury in case the unit were turned on without having the flash gun and the necessary bleeder resistors connected. The use of a voltage doubler circuit is also a safety feature because the transformer voltage required would otherwise be doubled.

The high voltage leads from the power unit to the box require the very best insulation. Since one side can be grounded a shielded cable with the inner conductor adequately insulated to prevent breakdown will give maximum protection. Although only about 60 volts is used in the push button control circuit good insulation is essential to avoid leakage which would prevent the full voltage being available for the discharge. It is hardly necessary to point out the necessity for good insulation in the handle of the flash gun.

Parts List

Condenser	Capacity	Working Voltage
C1	0.1 mfd.	2000
C2	0.1 mfd.	2000
C3	30 mfd.	2500
C4	10 mfd.	75

Resistor	Ohms	Watts
R1	2 meg.	½ watt
R2	2 meg.	½ watt
R3	2 meg.	½ watt
R4	2 meg.	½ watt
R5	2 meg.	½ watt
R6	.27 meg.	½ watt

Miscellaneous Parts	Ratings
Pilot light	110 volts
J1	Receptacle
J2	Plug and cord assembly
S1	DPST Toggle
S2	Shorting switch
T1	See Text
T2	See Text

In spite of all these precautions it is not foolproof and a few "don'ts" should be carefully observed.

1. Be sure the flash tube is in the socket before connecting the unit to the line.
2. Allow 25 seconds time after turning on the unit for warm-up and charging.
3. Allow at least an hour to elapse after disconnecting before replacing a flash tube or taking the power unit out for examination.
4. Don't try to discharge the condenser with a screwdriver.

Component Parts

The ratings of most of the parts are given in the parts list under Figure 2. Further particulars on certain critical items are as follows:

Transformer T1: One heater winding is 2500 volts above ground which means that in accordance with standard breakdown testing the unit should be tested at 6000 volts for 1 minute. Two separate 2½ volt filament windings are necessary unless separate filament transformers are used in an emergency repair.

Transformer T2: This is a special part also. The 15,000 volt peak of its output makes it comparable to the transformers used on some kinds of Electric Fence circuits. We have heard that the ignition coil used on model airplane engines makes a good substitute.

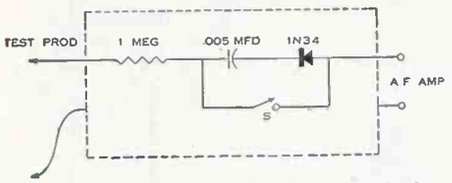
Receptacle J1 and Plug and Coil Assembly J2 are merely convenient means of connecting to the different kinds of synchronizers used on different cameras. Since the flash lasts only 1/5000 of a second it is necessary to ensure perfect synchronization between the flash and the opening of the shutter. Those

(*Continued on page 20-T*)

THE information presented in the Sylvania Service Exchange is contributed by servicemen as the result of practical experience. It is very carefully considered before being accepted, and we believe it to be correct and authentic. However, we assume no responsibility for results. Please do not send routine or generally known information.

THE Service Exchange

Simple Signal Tracer. I have been using the Sylvania crystal diode 1N34 as the basis of the simplest signal tracer that can be devised. The crystal diode is used



in a probe and is the heart of the instrument. Any audio amplifier can be used with this probe. It will detect R. F. and I. F. signals and will not detune the stage under test. R. F. and I. F. frequencies up to 100 MC are traced with the switch open so as to utilize the crystal diode. For audio tracing the switch is thrown to the "on" position so as to short out the diode. —Albert A. Rosen, Philadelphia, Pennsylvania.

Editor's Note: Care should be taken in using this on AC-DC receivers to see that the chassis is at ground potential.

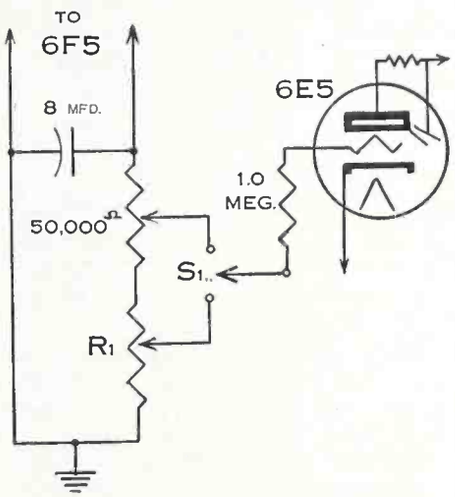
★ ★ ★

Locating Noisy Condensers: On several occasions, I have found arcing condensers to be the cause of rumble sounds and bad tone quality in radio operations. Procedure—disconnect one side of voice coil on speaker (Editors Note: It is best to substitute a 10 ohm resistor for the voice coil to prevent arcs in the output transformer.) then turn radio on. Turn volume up and listen for arcing sounds. Other arcing parts may be detected by this same method.—Charles L. Fryar, Euclid 19, Ohio.

More Service Hints Needed

Servicemen tell us that our "Service Hints" page is one of the most popular features of Sylvania News. Unfortunately the editors cannot write these, that's up to you, so send in those service hints you haven't got around to yet. Tube awards for accepted hints were resumed at the first of the year, but still they are not coming in fast enough. We can't promise to supply any scarce tube you request but there are small quantities available of a number of hard-to-get types.

Two Range Switch for Electric eye voltmeter: To get a better calibrated high voltage scale I have added a separate low resistance potentiometer between the original 50,000 ohm unit and ground, as



shown in diagram. The S.P.D.T. switch was also added. This arrangement not only gives a separate high volgage scale with good spread, but also spreads out the lower voltage scale, especially around medium voltages where it formerly started to crowd. For the added potentiometer R1, any value of wire wound unit below 5000 ohms will do the trick, the exact value being a matter of choice as to where you want the low voltage scale to end and the high voltage scale begin. I used 3000 ohms which on my instrument gives ranges of 0 to 50 volts and 50 volts to maximum volts. Try different values of resistors until you find the value that will give you the desired ranges.—William Ford, Jr., Chicago, Illinois.

★ ★ ★

Substitute for Type 1U5. A type 1S5 can be substituted for a 1U5 in Philco Model 46-350 and probably in other sets by making the following changes: Solder a No. 18 or No. 20 bus wire 1 inch long to all the socket terminals of a miniature socket. Place spaghetti on all leads leaving about ¼ inch of the wire exposed. Pins No.'s 1, 6 and 7 of the socket go directly into Pins No.'s 1, 6 and 7 of the set. Pin 5 goes to No. 2 of the 1U5. Pin 4 to No. 3 of the 1U5 and Pin 3 to No. 4 of the 1U5. A type 1S5 will prove just as satisfactory as the type 1U5 and the customer can change back as soon as type 1U5 becomes available.—Walter J. Zotkewicz, Shamokin, Pennsylvania.

ELECTROFLASH UNIT—Cont'd.

having flash attachments on their cameras will understand how to use these connections.

Photographic Data

The flash is bluish-white which is approximately the same as daylight when considering its effect on color film. The peak light output is 12,000,000 lumens and the flash duration is approximately 1/5000 second.

Table I

Comparison of shutter openings. Distance 10 ft. Shutter opening 1/400 sec.

Flash Bulb	Film Speed (Weston-Tungsten ratings)			
	16	32	64	125
Electroflash	f6.5	f9	f12	f18
Press 25	f6.5	f9	f13	f18
No. 0	f5	f7.5	f11.5	f14
Press 40	f6	f9	f14	f20

Table II

To get the "f" number of the shutter opening divide the number given for your film speed and flash bulb by the distance in feet between the subject and the flash bulb.

Flash Bulb	Shutter Speed	Film Speed Weston-Tungsten ratings			
		16	32	64	125
Electroflash	Any	65	90	120	180
Press 25	1/400	65	90	130	180
No. 0	1/400	50	75	115	140
Press 40	1/400	60	90	140	200

ADVERTISING AND THE RADIO SERVICEMAN

(*Continued from page 17-M*)

name with the undertaking and there will be a fertile market established for your services and radio parts. It's good publicity.

A DIRECT MAIL CAMPAIGN

Direct mail is particularly suited for the radio appliance dealer because of its selective nature. Direct and immediate contact with potential markets uncovered by recent surveys or by tips from salesmen is made possible. Post cards or multigraphed newsletters can be sent to the selective market. New possibilities may be discovered by the simple procedure of sending prepaid cards to your area, asking the potential customers to check items they are interested in buying this month—and four months from now. Omit any obligation to buy. Follow-up should point to the popular selections, probably in the form of another direct mail device. The customer needs prodding.

Its value lies in its selectivity. You may want to send a list of high-priced items to the better homes in your area, and lists of more reasonably priced articles to the other parts of the neighborhood.

Subtract the number of sales grossed over the period of a direct mail campaign from the number of cards sent out and you'll have an accurate count of the effectiveness of your venture.

A mailing list must be developed and kept up to date. It need be selective. It can be composed from the classified telephone directory and directories of clubs, associations and lodges in your neighborhood.

There is no better medium in advertising than good service and a presentable appearance. A well satisfied customer will go home and tell family and friends about your shop. Others come. The good word spreads. This is advertising by recommendation. Cleanliness of store and personnel, neat looking stockpiles, refinement in manner and attitude inspires confidence and respect in the customer's mind . . . and a desire to buy. That's money in the pocket.

"Worrying takes up just as much time as work, but work pays better dividends."

HOBBY THAT PAID OFF

Arthur Lindner . . . . Radio "Bug" Exterminator

Radios were once only a hobby with Arthur Lindner. That was back when they were called "wireless sets." Those were the days when it took a mechanic to listen to one. Mr. Lindner's avocation was ironing the "bugs" out of his radio. He was successful to the point that he was soon doing the same for all of his friends. In fact, so successful, that he gave up his work as designing engineer for an automobile body manufacturing company, to make radio repairing his business.

Mr. George Grove, his serviceman and Mr. Lindner have gone a long way since the days of the crystal sets. June 7th, they opened their doors to the public at 22031 Grand River in Detroit, Michigan. More than two thousand attended despite bad weather. They had breathed the last word in radio repair service. The opening was nothing short of spectacular. The shop itself is modernly neat, roomy and practical. The repair service unit is out in the open where customers can see servicemen at work on their sets. The grand opening was highlighted by a drawing for a table model radio set and a demonstration of a new FM unit.

Mr. Lindner believes in advertising. He runs large ads in the local newspapers and advertises four days a week over WJBK from 3:30 to 5:00 P.M. The radio program is called, "Jack the Bell Boy." Mr. Lindner is behind a new Program as well, "The Redford Hour," same station, three days a week at 7:15 A.M.

The record of 16,000 service jobs accomplished in a six year period speaks adequately for the record and reputation of "Lindner's."

YOUR SHOP IN THE NEWS

A picture of your radio shop and an accompanying article can be published in the Sylvania News as "The Shop O' The Month."

From the pictures and information sent in by you and other servicemen from all over the country, one will be chosen as "best typifying the streamlined radio repair business." This "column" is for the radio service dealer. Send us your pictures and information Your fellow serviceman will do the same for you!

This is your opportunity to compare your shop with others. Where is yours superior? In what is it lacking?

Mail your material to Sylvania Electric Products, Inc., c/o of the Editor, Sylvania News, 500 5th Avenue, New York 18, N. Y.

DID YOU KNOW . . . . .

. . . that thirty billion, billion, billion electrons would weigh only one ounce?

. . . what electronic devices can do for you in the future? The electron could be harnessed to prevent dust collecting in your house, permit an interroom telephone system without wires, purify the air in the nursery, open and close doors, replace the moth ball, and answer the telephone for you when you are out shopping. This is the age of the electron!

. . . that it is more economical to use a large light bulb rather than several smaller ones equal to the same number of watts? A 100-watt bulb will give 50% more light than four 25-watt bulbs and uses the same amount of current.

. . . that there is a lamp that will burn for 1000 years? It is the "grain-of-wheat" lamp, 3/8 of an inch long and 3/32 of an inch in diameter it uses only one-fifth of a watt. The lamp is used inside of medical instruments to give light for investigation and work inside the human body.

. . . that electricity was discovered 2500 years ago? It all started in 554 B. C. when Thales of Miletus, a Greek philosopher, is said to have observed that an amber rod, when rubbed with a piece of flannel, would attract straws and other light objects.

INCREASED COSTS OF SALES PROMOTION HELPS

This is getting to be an expensive world to live in. Cost of everything is going up. "Everything" includes Sylvania Sales Promotion Helps available to the radio dealer and serviceman.

It has always been Sylvania's policy to absorb a part of the cost of sales promotion helps in order to aid the radio dealer.

During the war, Sylvania continued to make available, store identifications, business forms, sales promotion items, technical literature, and store service helps. The pre-war price quotations were maintained because prices were expected to return to the old levels.

But they haven't. Nor will they. So effective July 25th, Sylvania will make the following price changes. The Company will continue to absorb the same proportion of the cost as before.

	Present Price	New Price
Shop Coats	$1.95	$2.75
Service Jackets	1.75	2.25
Service Kits, small (black leatherette or black and white airplane cloth)	3.00	4.00
Service Kits, large (black leatherette)	5.00	6.00

Technical Section Binders

All back issues of the Sylvania News Technical Sections have been available, complete with binder, for $1.00. Because of bulk and also because of increasing prices it now becomes necessary that we put out the Technical Section Binder in two volumes. Volume No. 1 will contain all issues from May 1935 to January, 1941. Volume 2 will contain all issues from January 1941 to date. The price of these binders is $1.00 each. This change becomes effective July 25, 1946.

When ordering these binders be sure to specify which volume is desired unless, of course, your order covers both volumes.

ON THE COVER

World's Smallest Phonograph

Our cover girl is "typically American." There is an exciting, wholesome "outdoor" look about her. She radiates vim and pep, and enjoys athletics. Yet with all her energy, she likes to travel light.

Slung over her pretty shoulder is the latest and lightest thing in phonographic music-making that the market is offering. It's the world's smallest portable phonograph! It is carried like a camera and weighs only four pounds.

The Lilliputian device is an example of the new specialized product the post-war manufacturer will be offering the consumer.

WANTED
Your Ideas

For the radio serviceman with an idea . . . five dollars! The device you set up in your shop to save you valuable time and effort can earn for you a five dollar reward in Sylvania Service Helps.

There's more "take" to this plan than give. Along with yours, other ideas will be submitted. Ideas published each month will be awarded an Advertising Material Certificate worth five dollars in Sales Promotion helps of your own selection.


ADVERTISING MATERIAL CERTIFICATE

Here's the procedure. Mail to Sylvania Electric Products, Inc. c/o Editor, Sylvania News, 500 5th Ave., New York City, your idea and a neat sketch of the set-up (drafting technique will not affect the selection of an idea). If your idea is published, select the sales promotion helps you can use from Sylvania's "Multiplying Pennies" folder (your Sylvania distributor has them). Check on the order blank found in the folder the items you need up to the amount of five dollars and send it with the certificate to the Advertising Department, Emporium, Penna.—they will send you the service helps you have selected.

"We Live Within Spitting Distance Of Our Fishing"

In the June issue of "The Reader's Digest," is related the story of Sylvania Electric's decentralized industry, "Big Stuff in Small Towns."

The story was originally published in the May 15th issue of "Forbes" magazine.

Roger Riis has done a remarkably fine job in the development and the presentation of the tale of our 20,000 employees who don't believe in big cities or large factories, and won't work in 'em.

FATHER OF TELEVISION IS DEAD

John L. Baird, British scientist, the first man to successfully demonstrate the transmission of an image by photo-electric cells, is dead.

The struggling young Scottish engineer began serious work on the subject in 1922, in a two-room flat in London.

In 1924, Baird completed his first television apparatus, capable of transmitting the image of a maltese cross over the distance of two or three yards. In 1926, he let the scientific world see the results of his efforts . . . the image of a person transmitted from one room to another. Transmission was achieved by a perforated, rotating disk that permitted light to fall on the subject in sequence. The reflected light affected light-sensitive selenium and later photo-electric cells, the reaction forming electric impulses for transmission.

By 1928, images were being sent across the ocean. There followed a series of innovations including daylight pickup, experimental theatre television and work with colored disks to transmit colored images.

1937 . . . the B.B.C. decided to use the Marconi-Emi system of electronic scanning rather than Baird's older mechanical method.

18,000,000 HOME RADIO MARKET

(Continued from page 18-G)

What do people do when their set doesn't play well?

Thing Done	Total %	Group A %	Group B %	Group C %	Group D %
Number Answering	100.0	100.0	100.0	100.0	100.0
Called a repairman	35.4	53.8	38.8	35.9	30.0
Took the radio to a repairman	29.2	27.8	26.9	28.4	31.8
Took tubes to repairman for testing	19.9	14.4	20.2	20.8	19.1
Took number from burned out tube and bought replacement	6.1	1.0	5.8	5.8	7.4
No tube ever had burned out	5.5	1.0	5.0	5.3	6.9
I repair radios myself	2.9	2.0	2.9	2.6	3.6
Did not have a radio	.9	—	—	1.1	1.2
Don't know	.1	—	*	*	—

All groups rely primarily on the repair man—but there is a tendency for the lower income groups to replace their own tubes.
*Less than 1%.

But even if they do buy tubes . . .
there is little tendency to shop in order to get better price.

Shop	9.3%
Go to one store only	90.7
	100.0%

And less than three out of ten buy tubes at the place where set was purchased

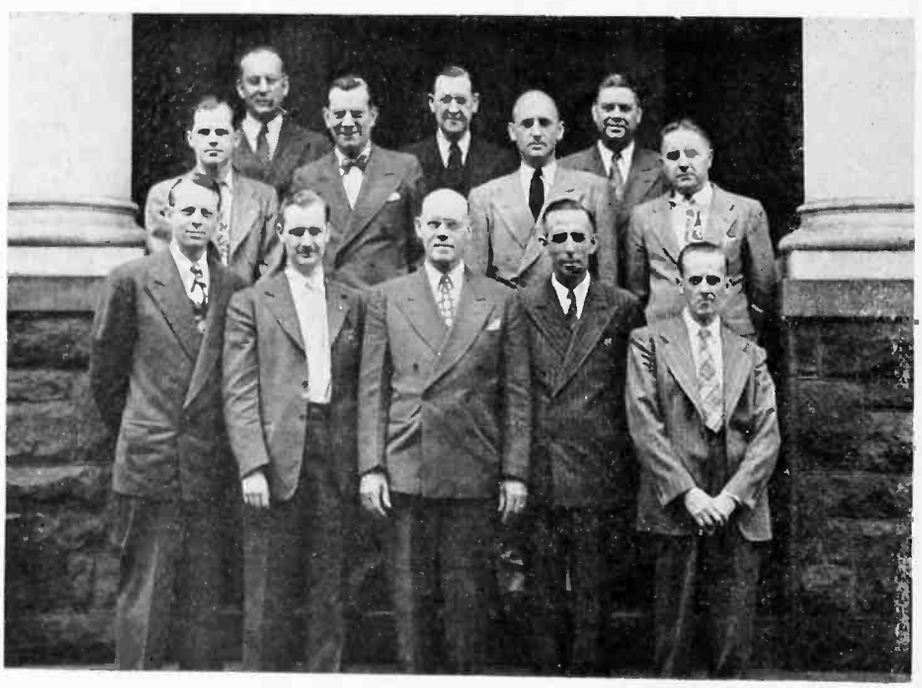
Where bought	29.0%
Other places	71.0
	100.0%

Between V-E Day and V-J Day
people intended buying the following types of radio sets.

Type	Number of Sets
Console Combination	7,068,000
Console	6,358,000
Table	3,702,600
Table Combination	617,100
Midget	486,200
Miscellaneous	467,500
Total	18,700,000

The units of the report not included in this article will follow in the next issue in an article about "Your Store."

PILGRIMAGE TO THE EAST



Sylvania has always maintained as close a contact as possible with its distributors and dealers. Though extended trips and the like went the way of all things not directly "essential" to victory during the war period, even then, Sylvania did its best to maintain that contact.

Peace is here. Part of the reconversion was the trip of the ten members of the Pilgrim Distributing Co., of Chicago to Emporium.

Looking at you from left to right, rear row: Bob Almy, Assistant General Sales Manager for Sylvania; Al Oliver, Owner of Pilgrim; Bob Henderson, Sylvania District Manager. Middle Row: Stan Paige; Tom Ryan; J. H. Hauser, Sylvania Sales Supervisor; Bob Kronenwetter, Advertising Production Manager of Sylvania. Front Row: Joe Kindemann; Al Oliver, Jr.; R. L. Squires; Carl Ludolph and L. L. Lynn.

10 MILLION FAMILIES INTERESTED IN TELEVISION

(*Continued from page 18-G*)

Yet, among those who have witnessed a demonstration, members of the lower income groups were more satisfied with the results. However, considering where the demonstrations were given (the World's Fair, radio stores, etc.) and that many were seen on early models, the overall opinion is favorable. From these demonstrations, 12.1% of the public thought the reception poor. But according to a poll conducted after the recent Louis-Conn fight, present acceptance-attitude is more favorable. Caustic Representative O'Toole is reported to have said he had seen more of the fight by television than 95% of the people at ringside.

The average family thought that they would have to pay from $200 to $250 for a television set. Only 5.9% thought that they would have to pay over $500.

Mr. Frank Mansfield, Director of Sales Research for Sylvania, said that a set designed for an audience of four would apparently fill the need of 80% of the families interviewed.

The survey indicated that 71.8% of the people interviewed wanted color television. Yet only 22% of the potential consumers said they would pay over $100 extra for it.

A New Medium

Mr. Mansfield stated that there were no indications that television would supplant moving pictures in the minds of the consumer. People are thinking of television as a new medium, practically adapted to on-the-spot news coverage, sports, drama, etc. 33% said sports would be their favorite program, 20%, drama and 19.4%, news.

Despite the limitations of television—a limited number of stations, no day-time programs and "blurred image"—comparatively few people actually believed these problems would affect their decision to purchase a television set.

FACTS AND FIGURES . . .

Buyers Strike Held Unlikely 'Till '47

The public is assuming a more critical attitude toward rising prices, lack of quantity and quality. Yet Dr. R. C. Shook of the International Bureau of Statistics said that he expected the sellers market to be with us for another year. The peak of the present price cycle will come, probably in 1947, the first indication of the new attitude manifesting itself in the first quarter of the year.

Dr. Shook's statement was made one day before the New York Times ran their story about the worst market break in years, blaming a twenty point drop of market issues on a developing buyers strike.

No More Roof Over Our Heads

With the death of the OPA, prices could be expected to skyrocket. However, the attitude of many manufacturers has been to restrain a rise in prices for the period ahead. Control must be realized by increasing production to the point where supply is equal to demand. But top government officials have cited small household appliances and radios as scarce articles that may command higher prices right away. Yet voluntary discipline on the part of the large manufacturers with a cautious rise in prices is the watchword.

A Million Sets A Month

Ray C. Cosgrove, RMA president, states radio set production has reached the one million a month level, reminiscent of pre-war days.

WORMS IN YOUR APPLES

A new group of microwave tubes that may be built into industrial production lines for inspection, control and grading operations, until this time practically impossible, was announced recently by M. A. Acheson, Manager of the Advanced Development Laboratories of Sylvania Electric Products, Inc. The tiny "rocket tube" is able to indicate faults in the structure of products, moisture content, impurities; even indicate the presence of worms in your apple.

SYLVANIA NEWS

Published By
SYLVANIA ELECTRIC PRODUCTS INC.
Manufacturers of Sylvania Radio Tubes and Electronic Devices, Sylvania Incandescent Lamp Bulbs, Fluorescent Lamps and Equipment.

Vol. 13, No. 5 JULY, 1946

RETURN POSTAGE GUARANTEED

For: Mr. P. T. Adams
16413 Lorain Avenue
Cleveland, Ohio 11

A

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SYLVANIA NEWS

AUGUST, 1946 EMPORIUM, PENNA. VOL. 13, NO. 6

In This Issue:

COMMENTS . . . .

By BOB ALMY

Sylvania Tube Testers

Important news this month is our announcement of Sylvania Radio Tube Testers. Two models are presented. These are illustrated and described in the Technical Section. One, the Type 139 is a counter style, the other, Type 140 is designed for portable use. Except for the cases, the two types are identical as regards circuit design and operation.

It is logical that a radio tube manufacturer should build a tube tester which will satisfactorily test his product, for use by his customers in the field. For many years we have been building our own laboratory and production tube testing equipment. Obviously this type of equipment is highly specialized, quite expensive and not suitable for every day use by radio repairmen. Our problem therefore, was to construct a tube tester which would be simple to operate, give satisfactory performance and meet the requirements of the radio repairman—all at a reasonable price. This, we believe we have accomplished.

These new Sylvania Tube Testers are manufactured at our Williamsport, Pennsylvania plant. Both types are in production and are available in limited quantities through Sylvania Distributors to whom sample shipments have already been made. If you need a new up-to-date tube tester we suggest that you check with your Sylvania Distributor and see these modern instruments.

Tube Deliveries

The delivery situation is about the same as reported in this column last month. We expect that more of the lock-in and bantam battery types will be available in an increasing quantity over the balance of the year. This will be good news for you dealers located in rural areas.

Tube Price Change

Effective August 23rd, 1946

Enclosed is new radio tube price schedule as established by the O.P.A., reflecting a 20% increase in list prices, — — also revised retailer cost prices.

CONSUMER SHOPPING HABITS AFFECT DEMAND FOR RADIO SETS

From the Second Radio Survey conducted by Sylvania Electric's Research Department come the following statistics . . . facts about the usually unpredictable, irrational American Shopper, that affect the demand for radio sets and parts.

The radio store, department store and furniture store sell nearly 60% of all sets.

	Midget	Table	Console	Comb.	Portable	Total
Radio Store	32.0%	23.5%	24.0%	24.5%	28.0%	25.0%
Music Store	1.5	4.5	7.0	9.0	6.0	5.5
Electric Appliance Store	10.5	12.0	9.5	13.5	18.0	11.0
Drug Store	2.0	1.0	—	—	2.5	1.0
Department Store	18.0	18.0	18.0	17.5	14.0	18.0
Furniture Store	10.0	14.5	22.0	15.5	7.0	16.5
Sporting Goods Store	2.0	.5	1.0	3.5	—	1.0
Auto Supply Store	3.0	5.5	3.0	3.0	6.0	4.0
Mail Order	1.0	.5	1.0	—	—	.5
Miscellaneous	20.0	20.0	14.5	13.5	19.0	17.5
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Yet the pattern of channel of distribution varies widely with general type of set.

We can detect no trend in shopping habits which would suggest that one or more types of store are gaining position at the expense of others. The indications are that radio stores, department stores, etc. sold about as many sets proportionately in recent as they did in earlier years.

Year	Radio Store	Music Store	Electric Appliance	Dept. Store	Furniture Store	Auto Supply	Other
1940 & later	24.5	4.4	12.0	17.1	14.5	4.1	23.4
1937-39	22.4	5.3	11.5	21.6	14.8	5.8	18.6
1934-37	27.6	6.8	10.0	14.3	22.0	2.0	17.3
Through 1933	29.4	8.3	9.8	16.9	19.0	3.0	13.6
Total	25.0	5.6	11.2	18.0	16.4	4.1	19.7

The reasons why people buy at certain types of stores instead of other types.

Reason	Total %	Group A %	Group B %	Group C %	Group D %
Number Answering	100.0*	100.0	100.0	100.0	100.0
Know the store is reliable	24.6	14.6	17.2	24.8	29.0
Bought through a friend	15.7	27.0	20.7	16.0	11.1
They had the make, model or type we were looking for	12.5	19.1	17.7	13.4	7.7
Got a good price	11.8	13.5	13.8	11.5	11.3
No particular reason—Don't know	11.2	9.0	9.4	11.7	11.3
Bought from a friend (second hand)	5.2	1.1	2.0	4.8	8.1
Had an account at the store	4.6	2.2	3.4	3.1	7.9
Saw an advertisement	3.0	1.1	3.9	3.0	3.0
That is the proper kind of place to buy a radio	2.9	2.2	6.4	3.2	1.2
It was the only place a radio was available	2.3	3.4	3.0	1.6	3.0
All other answers	2.0	—	1.5	2.6	1.4
Wasn't present and so don't know	9.3	9.0	5.4	8.8	11.7

*Percentages total more than 100% because some people gave more than one reason.

Reliability as a reason increases sharply as income decreases.
Conversely, friendship for dealer decreases as income decreases.

And if he comes back to buy other merchandise—here is what he wants.

Kind of Merchandise	Total %	Group A %	Group B %	Group C %	Group D %
Number Answering	100.0*	100.0	100.0	100.0	100.0
Furniture, floor coverings	23.2	5.0	13.2	26.6	25.8
House furnishings	16.8	17.5	19.8	14.8	18.9
Clothing	15.2	10.0	14.3	14.8	17.4
Radio, radio parts, phonograph	14.0	27.5	24.2	13.3	7.4
Small electrical appliance	9.7	7.5	11.0	8.9	11.1
Large equipment	7.7	12.5	4.4	7.4	8.9
Hardware and sporting goods	6.8	7.5	6.6	7.4	5.8
Auto accessories	5.2	5.0	3.3	5.9	4.7
Musical equipment	.6	5.0	1.1	.3	—
All other	18.5	15.0	17.6	20.7	15.8
Don't know	.6	2.5	—	.6	.5

*Percentages total more than 100% because some people named more than one kind of thing.

(Continued on page G-23)

SYLVANIA NEWS

MERCHANDISING SECTION

AUGUST, 1946 EMPORIUM, PENNA. VOL. 13, NO. 6

WINDOW DISPLAYS AS A PART OF YOUR ADVERTISING

The Importance of Advertising

The world is getting to be a smaller and smaller place in which to live. Not only are there more people in it, it's much easier to get around. Street cars, buses and private automobiles give the American Shopper an unprecedented range in which to shop—and to have his radio repaired.

Therefore, you are competing with the radio repair shop on the other side of town—with one fifty miles away.

Yet every city is merely a number of small towns thrown together. People will stick pretty much to their own neighborhood. If you'll give them a chance!

That's where advertising comes in. Advertising means, "to inform; to give public notice." Unless you let your neighborhood know you're there to perform a service, the members thereof will be off to another part of town for the lack of a nearer shop. **Advertising, therefore, is as much a part of radio servicing, as the servicing itself!**

Window Display Important To Local Radio Repairman

Window displays are one of the most productive forms of advertising. You, are serving a local area. The residents thereof pass your window a dozen times a week while shopping or on their way to work. You'll find your display reaching the greater part of your local market—yet few others. This is known as focusing. It saves the expense of advertising to an unavailable public. It is a guaranteed tonic for an overstuffed budget.

Two Appeals

Window display appeal is generally divided into two catagories: the emotional "stopper" and the appeal to the rational mind.

Vanity is an emotion. It is one of our basic drives. Therefore it is a successful salesman who can cause an individual to feel a product is going to improve his station in life. A bizarre, dramatic, or appealing display to stop the passerby . . . then the important thing is to get him into the store . . . to convince a reluctant, rational mind that it needs a radio servicing job or a new set of radio tubes.

The potential buyer will find the logic he seeks in: WHAT CAN YOU DO FOR HIM! Sales points might include: this is the season you'll want your radio repaired; it is the best service for the money; servicing and Sylvania tubes are necessary for peak performance. Summed up: convince the customer that this is the service he NEEDS, NOW.

A window is first of all and primarily, a "stopper." Its function is to stop the passerby; then to get him into the store. The rational appeal is presented therein. Yet large signs, price tags on low-priced items, etc., present a portion of rational appeal in the window display itself.

Setting Up The Display

There are several accepted ways in which a display is set up. There's a science to it.

Rule #1: There need be a continuity to any display. Otherwise the total effect is lost . . . and a possible customer walks away. Even for a group of displays, a central theme is necessary.

Rule #2: Peaking creates a center of interest. "Peaking" means the accentuation of one idea—of one article by making it stand out. Peaking makes for unity in a display.

Unity

Unity is rule #3. It's the punch in your display. Unity may be achieved by placing together many identical items. It has an overwhelming effect. For example you may fill your window with radios, all of the same model, or have hundreds of radio tubes cascading from a cornucopia.

Unity may be realized through the development of a central idea . . . by placing together articles that are generally used together. It gives the window shopper a chance to make comparisons.

Which poses rule #4: permitting the potential buyer to make comparisons. It distills a sceptical, reluctant apathy. Comparing radios, serviced and unserviced, lends itself readily to a window display design; placing the articles side by side, facing slightly in toward each other.

Rule #5: In your display, suggest someone has stopped here before. For people are imitative to the point of not being able to do any thing about it. One open radio in a group, a set turned around as though someone had been peering into its innards . . . I'd fall for that myself.

Rule #6: Movement may be used for peaking. One item in action in a mass display is a form of accentuation. Movement will catch the eye where a still object will not. And if it isn't quite clear why your mechanical gadget moves, watch the crowds gather. Rotating tables are the most common of the action displays.

Rule #7: Color is also used for peaking. One radio tube with a colorful wrapping or fancy draping sets it off from the rest. Spot lighting has the same effect.

(Continued on page M-23)

CUSTOMERS AND HOW TO TREAT THEM

There's one customer who is always right . . . the fellow who complains about parts or services he was promised but didn't get.

As for the others, they're not all right or all wrong. Each customer is an individual with an individual problem.

The point of salesmanship is to satisfy a customer, whether he is right OR wrong! Certainly, satisfaction doesn't "just happen." It takes thought, effort, tact, and concessions on your part. A satisfied customer in your radio store is money in your pocket. It won't be easy—but where there's a customer, there's a way.

A particular customer will demand exact service and quality radio parts. He has every right to. It's his money. You're there to see that he gets his money's worth. Give poor service and you won't be getting your service's worth.

For good (successful) salesmanship, cheerfullness is rule #1; even with an "impossible" customer. If he's tough because he didn't get what he was promised, you have it coming. Apology is your only out. If he's just plain grouchy, and you keep smiling, he may still go away looking sour. But he'll feel about as small as a Sylvania proximity-fuse tube. And he'll be back for more of your service with a smile. And he, without the frown.

The key to success is a sales approach, from the customer's point of view! Put yourself in his shoes (if he has any). Remember that he wants to know three things: what is it he's putting his money into; who says so; and what is the product going to do for him? From that vantage point, the next five steps follow logically.

Consideration means putting yourself in your customer's shoes.

Praise . . . sincere and timely.

Concession . . . saying at the right time, "You're right, I'm wrong."

Gratitude is a "Thank you." And meaning it.

Good service means doing something for your customer unrelated to the sale . . . and giving him what he has been promised.

KIOSKES!

Sylvania Advertises Abroad

Sylvania Electric Products, Inc. distributes its products to points all over the world. "International" is one of its important departments. Headed by Walter Coogan, International has distributors in most of the countries of the world.

American-made products sold in foreign lands are relatively strange. So goodwill advertising becomes the most important element of international selling.

The quality, quantity and economy of American goods are in demand in foreign markets. Andre Closset, Sylvania Electric's Belgian representative, has arranged for Sylvania tubes and lamps to be advertised on Kioskes (Belgian Newsstand) throughout the city of Brussels. Thousands of the city's citizens stop there every day.

Our tubes have a thousand tongues . . . our lamps cast international shadows.

Below is one of Mr. Closset's advertisements on a Kioske, along the Gare du Nord.

Sylvania Advertisement, along the Gare du Nord, Brussels.

SYLVANIA NEWS

TECHNICAL SECTION

AUGUST, 1946 EMPORIUM, PENNA. VOL. 13, NO. 6

ANNOUNCING

NEW SYLVANIA TUBE CHECKERS

FOR DEALERS AND SERVICEMEN

Sylvania Announces New Tube Testers for Servicemen and Dealers

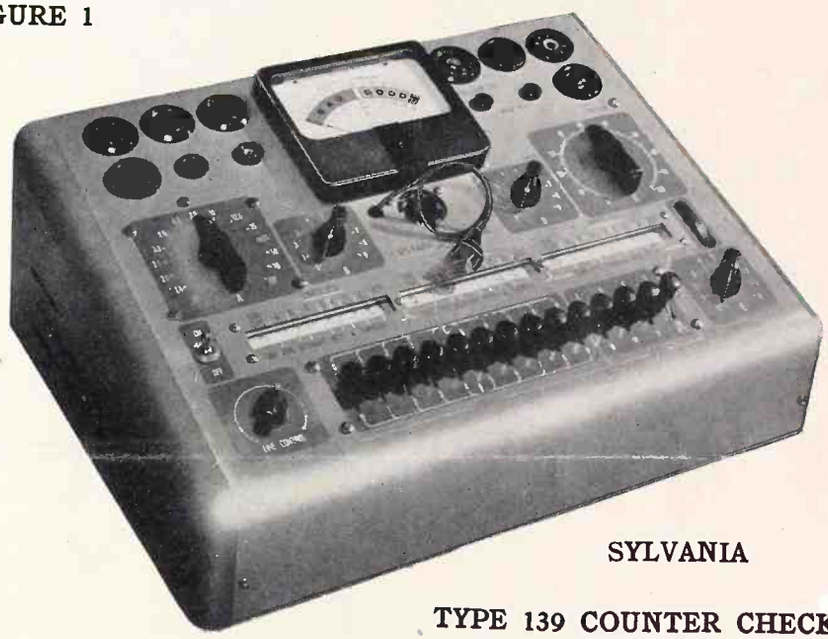
We hope it will be a pleasant surprise to radio servicemen and dealers to learn that Sylvania is now making two types of radio tube testers. The Williamsport Sylvania plant that designed and manufactured radar test equipment during the war now devotes a large part of its facilities to the new service instruments.

There will be no change in the Sylvania News editorial policy of printing "How-to-Make-It" articles for the servicemen who like to make their own equipment. Circuit information on the new Sylvania test equipment will interest both this group and also the many who are too busy to make instruments which they can purchase at a reasonable price.

For several years these columns have carried articles on tube testers —their performance and weaknesses. We realize that publication of these articles places us in a difficult position in announcing our own tube testers. We must of course meet all past criticism and overcome if possible design weaknesses of previously available tube testers.

Figure 2 shows a picture of a standard laboratory tube tester manufactured and used by Sylvania. It costs almost ten thousand dollars, and is built around a General Radio bridge which reads mutual conductance, plate resistance, and amplification factor for any combination of voltages or arrangement of electrodes. In addition, meters are provided for reading filament or heater current, plate current, grid current, screen current, diode current, grid emission, cut-off voltage, total emission, and heater-cathode leakage. The power supplies are all regulated and adjustable for any voltage possible for use on receiving tubes. A point-by-point method may be used and characteristic curves drawn from the readings.

FIGURE 1



SYLVANIA

TYPE 139 COUNTER CHECKER

What Servicemen Need

Few, if any, service shops could afford a tester of this kind. It would be quite out of place in a service shop. What servicemen need is a popular-priced tester that will do a good job of separating good from bad tubes. This is what the Sylvania tube testers shown in Figures 1 and 3 are designed to do. The measurement of any single tube characteristic is not important; performance under a typical operating condition is. An emission test is good because it shows the condition of the cathode which is generally the first part to wear out. It does not give the best test because, for many applications, an emission as high as the original is not necessary and because this test does not show open elements. Mutual conductance is another important characteristic but one which is extremely difficult to build into a medium-priced tester since small signals and low load resistance are required. An approximation, however, can be obtained which may be generally satisfactory but is complicated by the necessity of allowing for all tube types.

The instrument to be described is neither strictly a mutual conductance tester nor an emission tester but is a combination of the two. It therefore does a satisfactory job of selecting good from bad tubes but does not base this determination on any one characteristic.

(Continued on next page)

NEW SYLVANIA TUBE CHECKERS

Fundamental Circuit

Figure 4A shows the basic circuit. Notice that the voltage on the grid is 5 volts RMS and the screen voltage is tapped off the plate supply winding similar to actual operation. It tests all tubes dynamically with proportionate voltages on all elements. For simplicity and low cost, AC is used and is so arranged that the currents are half sine waves allowing high peak currents to be drawn without damage to the tube. In this respect it resembles actual use of the tube as an amplifier. The large, 4½" plate current meter is provided with a variable shunt to allow adjustment for different tube types. Small resistors in series with the plate and screen prevent damage in case of shorted or very gassy tubes. The complete circuit is shown in Figure 5. Several unusual features may be noticed in the switching circuits. For example, switch B is specially arranged so that when the socket terminals for the filament are selected it is impossible to short the heater winding by throwing any other switch. This is shown on the switch drawing by the bar between the contact circles. When the arrow contacting point 0 moves to point 1 the bars between the other contacts are shifted around a notch to connect all pairs of contacts except 1 and so on.

FIGURE 3.
Sylvania Type 140 Portable Tube Checker.

FIGURE 2. Laboratory Tube Test Set—An Example of Sylvania Design.

Switch D selects the other filament terminal after which circuit switches C and F allow the selection of the proper pins for cathode, plate, grid and screen circuits. The voltages and circuit conditions are selected by the test switches which also complete the circuit through the meter. Continuous adjustment of the meter current range is determined by the setting of potentiometer G. Then the meter clearly indicates good or bad tubes.

The roller chart specially designed for convenient, quick reference has settings for 486 tube types, (not counting variations in bulb size etc.) and space is provided to write in other types as they are announced. It has three channels; the first covering 1 to 5 volt tubes; the second 6 to 8 volt tubes; and the third 10 to 117 volt tubes. This eliminates reference to a booklet and speeds setting up for each type.

(Continued on next page)

NEW SYLVANIA TUBE CHECKERS

FIGURE 4 A

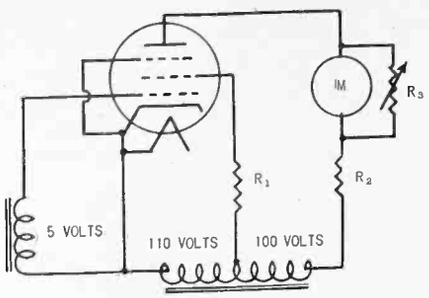
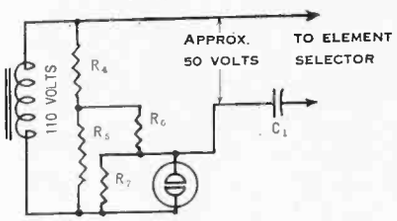


FIGURE 4 B



FUNDAMENTAL TEST CIRCUITS

Table of Values

R1	2000 ohms
R2	1500 ohms
R3	Meter Shunt
R4	8200 ohms
R5	82,000 ohms
R6	470,000 ohms
R7	470,000 ohms
C1	.01 ufd
Neon Lamp	¼ watt

Short Test Circuit

In Figure 4B is shown the fundamental circuit used for short and noise checking. This is a feature which so far is unique with Sylvania testers. Most servicemen remember the trouble they had when close spaced, high-efficiency filament type tubes of the 1.4 volt groups were tested in existing short testers. The 100 to 200 volts used in many testers produced such a strong electrostatic field between the filament and the grid (it may be higher than 20,000 volts per inch since the distance from grid to filament is about .007") pulled the filament against the grid to indicate a short on perfectly good tubes. The voltage divider circuit used in the Sylvania tester applies approximately 50 volts to the tube and still indicates shorts and leakage paths with a resistance up to 2 megohms. This circuit is arranged to apply some voltage at all times to the neon lamp which is slightly less than that required to light it. A short or leakage across the test terminals which increases this voltage by a few volts will cause the lamp to indicate. Pin jacks are provided for use with phones to help in locating intermittent shorts.

Other Circuit Features

Line voltage control is obtained by use of primary taps connected to the line control switch. The indication is obtained by rectifying the 110 volt secondary winding with the type 1LE3 and showing the current on the meter when all switches are at normal position. The adjustable resistor R105 is a factory adjustment for calibration so that the meter will read on the line when normal voltage is applied to all test circuits.

An internal ½ ampere fuse is provided as a safety feature to prevent damage to the transformer in case of accidental shorts.

To save waiting for tubes to warm up which might have open heaters a test is provided to indicate open circuits immediately.

Limitations

In the use of this type of instrument it should be remembered that the meter readings may not necessarily show a high degree of correlation with mutual conductance, conversion conductance, oscillation capability, power output or audio gain. It is obviously impracticable to get all these in one small, compact and moderately priced instrument.

However, with the exception of resistance-coupled audio amplifiers the instrument described, due to its combination of characteristics, will give good correlation with performance in the usual receiver circuits. Tubes used as voltage amplifiers in resistance-coupled circuits require such small currents that the amplification factor is the only characteristic of importance. Most servicemen have found tubes which test weak but still operate perfectly or vice-versa. Some instances of this may still occur in the Sylvania tube tester but this possibility has been eliminated as far as possible.

Provision For New Tubes

Sylvania has attempted to anticipate future development and make as much provision as possible for tubes which will be introduced in the next few years. A space is provided for an extra socket in addition to the nine existing socket types. All the circuit selecting switches are provided with extra terminals so that more complicated tubes may be provided for.

Sylvania News will of course do its best to notify all readers of the proper settings for newly announced types. Since Sylvania makes the tubes as well as the tester you can be sure that you will receive all possible help in maintaining an up-to-date, efficient service shop.

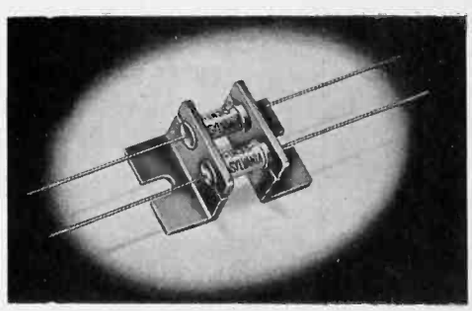
Sylvania Tube Testers are now being delivered in limited quantities. Your Sylvania Distributor has samples on display.

MATCHED DUO-DIODE CRYSTALS SYLVANIA TYPE 1N35 GERMANIUM CRYSTAL

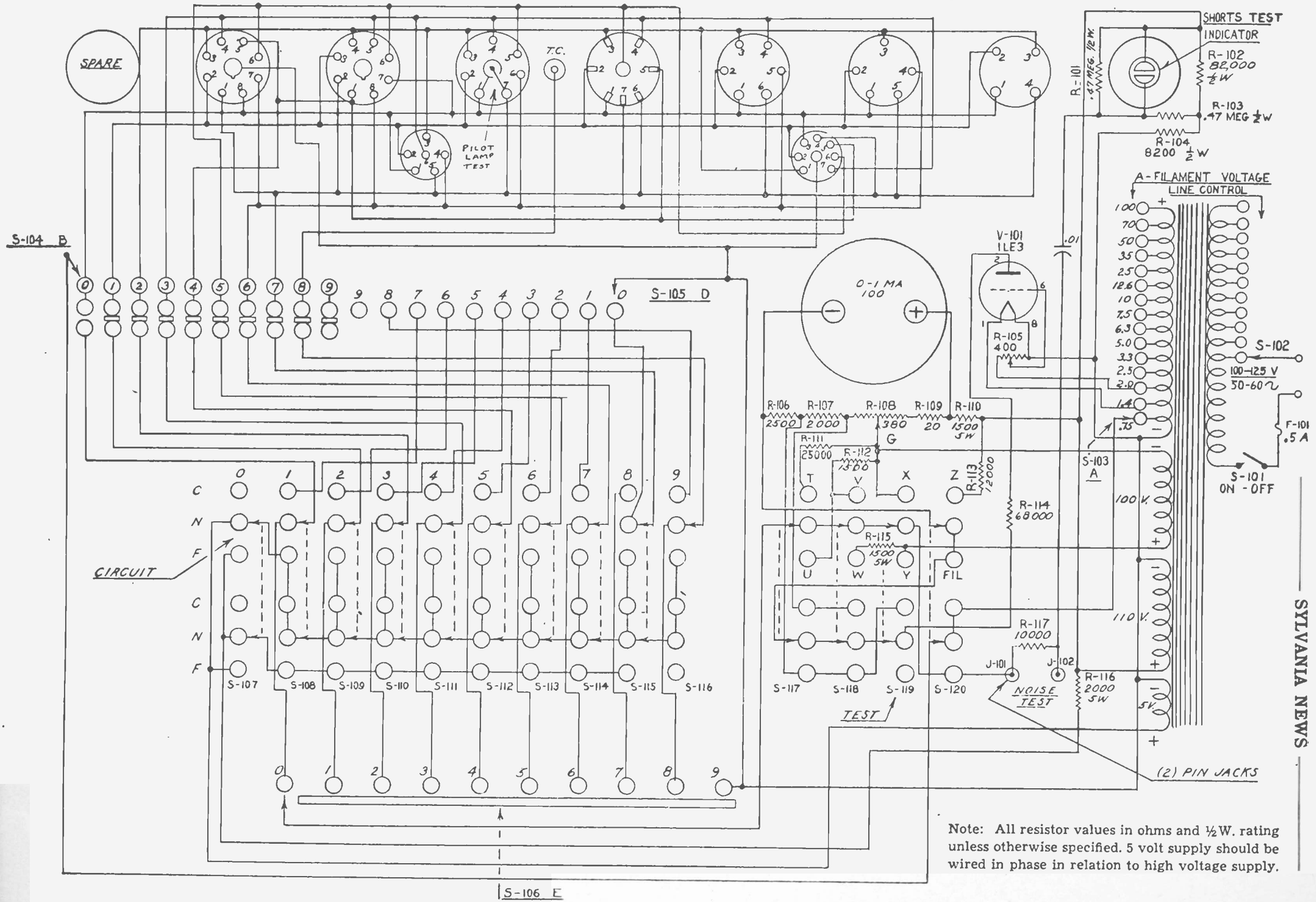
In February Sylvania News we announced the Germanium Crystal type 1N34. This month we are starting deliveries on a new unit, type 1N35, which consists of two type 1N34's mounted in an insulating holder. These two units are closely balanced and may be used as an F. M. discriminator particularly or in any circuit requiring a double diode.

Ratings on Sylvania type 1N35 are as follows:

Max. peak inverse anode voltage	50 volts
Max. peak anode current	60 ma.
Max. D. C. output current	22.5 ma.
Max. surge current	100 ma.
Max. reverse current at 50 volts	20 ma.
Units matched in conducting direction to	10 %
Units matched in blocking direction to	20 %



Schematic Circuit
Sylvania Models 139 & 140 Tube Checkers



Note: All resistor values in ohms and ½W. rating unless otherwise specified. 5 volt supply should be wired in phase in relation to high voltage supply.

SYLVANIA NEWS

WINDOW DISPLAYS AS ADVERTISING

(*Continued from page M-21*)

Demonstrations

Rule #8: Demonstrations are important in that they appeal to more than one of the senses. A demonstration model permits the customer to touch the finish of a display, see and hear it. Radio demonstrations may include tone comparisons between a set that needs servicing and a serviced set. Record displays should always have a player machine nearby. There is nothing more frustrating to a browsing consumer than a "Do Not Touch" sign.

Rule #9: Selling radio servicing is selling entertainment. So it is a good idea to identify your displays with musical and radio personalities . . . and the current movie down the street.

Rule #10: Do not put price tags on quality products in your window. If an individual is going to put out a large sum of money, he isn't likely to make up his mind outside your window. Displays of floor models, e.g., ordinarily start the window shopper thinking about such a purchase.

Rule #11: The majority of your sales are made to housewives. Remember, they can't picture an item in a dirty display window in their spotless homes. Your window display must be clean and fresh if a housewife is to picture a product in her home.

ON THE COVER

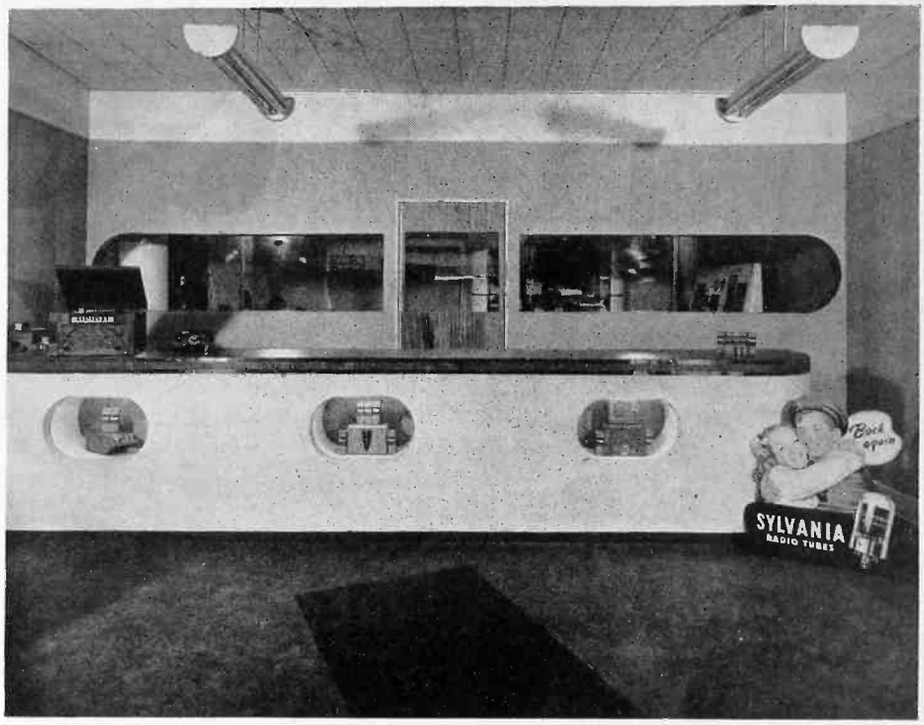
"Maisie" Is Back

Ann Southern, her intriguing characterization of the beloved "Maisie" and her hilarious adventures are back on the air after a six-week summer vacation. Every Friday night, 10:30-11:00 P. M. E. D. T., CBS presents Maisie as publisher of a small town newspaper, tangling with the community's odd characters.

The program has been brought to you from Hollywood since July 5th, 1945. The show went off the air for the summer, June 29. Broadcasts were resumed August 16th.

SHOP O' THE MONTH

Real Radio Service



Of all the problems that present themselves in this business of radio servicing, few are so important as keeping your shop neat and attractive. These are MUSTS in maintaining customer confidence, reports Henry Faber, Chet Brown and Thad Haveman of Real Radio Service, Grand Rapids, Michigan.

"Originally it was very difficult to maintain order in our radio repair department, for all of the radio chasses were put on the floor. It slowed things down considerably when sets were needed on a few moments notice. We solved that brow-knitter by building large racks where incoming and outgoing sets were kept in order and a minimum of time wasted in locating them.

We wanted to be traders in customer confidence. To accomplish that, we built our own workbench in order to improve the efficiency of our shop. We experimented with several different setups and instrument arrangements. From them, we decided the practical solution was to mount the testing equipment into a permanent panel where all units would be easy to reach and to read. Built into the bench was a special tool rack, a place for radio chemicals and drawers for small radio parts. The drawers are sectioned and marked, one item to a drawer. For example, the resistor drawer has space for sixty different values of resistors. There are drawers for condensers, volume controls, vibrators, audio-transformers, I.F. coils, etc.

In addition we built a tube rack to match the service benches which

have been stocked with Sylvania tubes since we first started business some twenty years ago. We have found that Sylvania tubes give us less trouble than any other, and the Company has done a wonderful job keeping us supplied with tubes during the period of critical shortages. It was "real service."

DID YOU KNOW . . .

. . . that there has been a 22,000,000 volt electron beam developed at the University of Illinois? It is the most powerful free beam ever produced. It is expected to aid in the treatment of deep-seated cancer, the study of the interior of the atom, the behavior of electrons and create artifically radio active substances. The principle will be used to develop a 400 million volt betatron.

. . . that fluorescent lighting is now a 100,000,000 dollar industry?

. . . that there is an X-ray device that can identify fake coins and diamonds?

. . . That there is: a combination incandescent and fluorescent lamp that doubles the illumination of any other type lamp . . . a device that can count 100,000ths of a second?

. . . that an electronic device has been developed, sensitive to the point of recording the weight of a speck of dust.

. . . that lightning travels at the speed of 200,000,000 miles per hour?

. . . that germicidal lamps (manufactured by Sylvania Electric Products, Inc.) have cut poultry deaths as much as 68%?

. . . that San Francisco's telephone book has 257 Wong numbers —wonder how you get hold of anybody in Chinatown?

UNIQUE MISSION

Behind the counter, left to right: "Hank" Fischman, "Bob" Callsen (Owners) "Johnnie" Ventura, and John Guichand.

Mission Radio Distributors of San Antonio, Texas is one of the first distributors to experiment with self service. This unique mission is one of the first of its kind in the southwest.

Located in the center of the spacious shop is a "U"-shaped self service counter which doubles as a display counter and sales counter. The unit is eighteen feet long and eleven feet wide. Small items such as condensers and resistors and other unpackaged radio parts are displayed in bins. In addition, there are self service racks along all the walls. Because the serviceman is free to look around and make his own selections at his leisure, Mission Radio's self-service technique has been remarkably successful.

FOR HIS IDEA— FIVE DOLLARS!

Five dollars in advertising material to E. D. Cole, Chicago for his idea, "streamlining" his radio repair shop. Not only did he come up with a snappy idea, but he came up with it FAST! Notice of the contest was in the mail August 3 (July issue, SYLVANIA NEWS)— his letters was postmarked the 8th.

Below is his letter. NOW we're waiting to hear from YOU.

Other ideas received in August will be considered for publication in the September issue.

August 8

Dear Sir:

One of the handiest items I have in my shop is my storage battery mounted on a dolly. Parts include four revolving casters mounted on a flat base; and padding to collect battery juice that drips through.

I can use it at the bench, under the counter to check auto radios before they're taken out, or move it over to the small charger I have mounted by the wall.

The dolly can be pushed with the foot, or pulled around by a cord attached to a screw-eye in one end of the dolly.

A cover over it keeps fumes down.

Yours truly,

David V. Chambers

PUBLIC REACTION TO COLOR TELEVISION

C. B. S. reports that at a television demonstration before ninety owners of black and white television sets and one-hundred and one persons who had at least seen a black and white demonstration, the reaction was decidedly favorable. 82% of the individuals present said the demonstration was beautiful. 18% believed it to be "brilliant and easy to see."

Set owners maintained they would pay 34% more for color in a medium-sized set; 28% more in a large set. Non set owners said they would be willing to pay 49% more for color television.

LIMITED OUTPUT FOR QUALITY RADIOS

The New York Times reports an estimated market for five million quality radio and radio phonograph sets. Yet in 1947, it is expected that only one million quality instruments will be produced. It will be impossible to absorb the insistent demand for large floor models within the next several months. The demand was evident even back in 1942 when 50% of the dollar volume of radios was spent on radio phonograph combinations. However, in the last week of June, only 10% of radio output was in quality sets. Assembly capacity is tremendous, but the shortages of wood needed to manufacture radio, FM and phonograph cabinets and materials needed for radio parts are such that no more than a million quality radio and radio phonograph sets will be produced next year. Yet despite shortages of materials, more sets have been manufactured in the past three months than during 1941.

The industry may hit its stride in a month or so, to the tune of 3,500,000 dollars worth of radio-phonographs per month, based on retail prices.

More radios mean more business for the radio serviceman.

A Word From The Wise . . .

. . . is not always sufficient. But we'll try.

"Lose an hour in the morning and you'll be all day hunting it."—Bishop Whatley.

"If you lose your temper, it is a sign that you have wrong on your side."—Chinese Proverb.

The only way to make a "come back" is to go on.

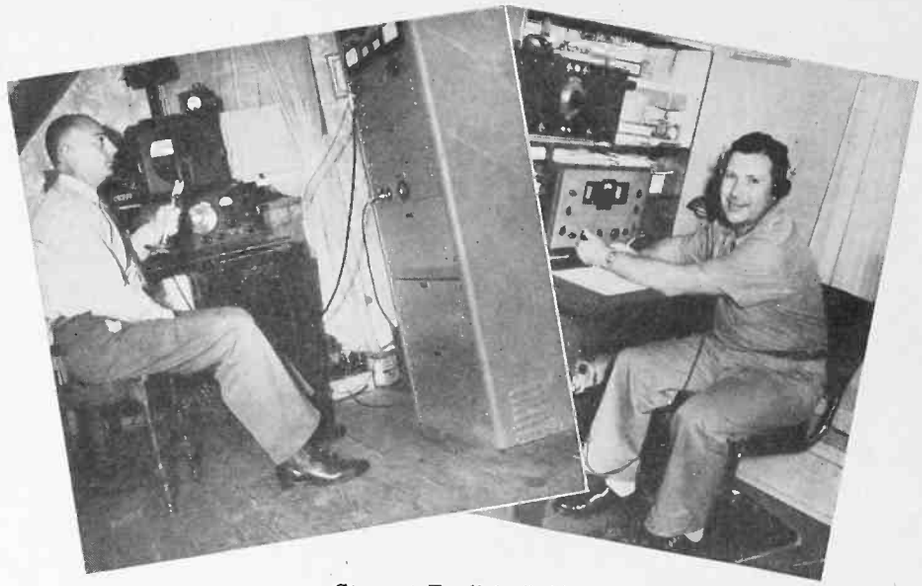
When you buy things for a song, watch out for the accompaniment.

You'll never stumble on anything good while sitting down.

Real intelligence is like a river; the deeper it is, the less noise it makes.

"The triumph song of life would lose its melody without its minor keys."—Mary Clark Leeper.

SYLVANIA "MINUTE HAMS"



Stewart English (left), and Allan Glaes (right), amateur radio hams at their radio transmitters over which they sent Red Cross messages and river stage readings to Washington, D. C., during the recent flood in Williamsport, Penna.

Williamsport was up to its knees in flood water. Men rushed from their desks to do what they could to stop the rising menace . . . and to keep from getting wet. Stewart English and Allan Glaes of Sylvania's Williamsport plant made for their amateur radio sets. Their job that day was exciting and invaluable. They assisted the Red Cross by sending messages around Williamsport and river stage readings to Washington, D. C. over their seventy-five meter amateur phone transmitters from early Tuesday morning, May 28th until that evening when the thirty foot crest of the flood had passed. Williamsport was badly damaged but the danger was over.

English, whose call letters are W3RFN, and Glaes, W3AVK, and John Heim, W8UFP, also of Williamsport, were outlets for the Susquehanna Network. This network is composed of amateurs along both the north and west branches of the Susquehanna River and its important tributaries. Over this network flood messages were sent to W3UA at Safe Harbor, Penna., below Harrisburg. W3UA has a direct wire to Red Cross headquarters in Washington by means of which information is quickly sent through this amateur network between flooded areas on the Susquehanna and national Red Cross offices.

CONSUMER SHOPPING HABITS

(*Continued from page G-22*)

And those who have purchased at your store previously have bought this type of merchandise.

Kind of Merchandise	Total %	Group A %	Group B %	Group C %	Group D %
Number Answering	100.0*	100.0	100.0	100.0	100.0
Furniture, floor coverings	31.4	17.0	20.8	31.9	38.4
Radio, radio parts, phonograph	15.3	27.6	23.8	14.0	11.2
House furnishings (linens, china, lamps, etc.)	12.0	17.0	10.9	11.2	12.9
Clothing	11.4	10.6	9.9	11.5	12.1
Large equipment (refrigerator, etc.)	10.6	4.3	13.9	11.0	9.8
Small electrical appliance	9.7	14.9	16.8	8.9	6.7
Auto accessories (tires, tubes, etc.)	6.7	6.4	4.0	6.4	8.5
Hardware and sporting goods	6.4	4.3	5.9	7.9	4.5
Musical equipment	1.2	6.4	2.0	.8	**

(*Continued on page G-24*)

CONSUMER SHOPPING HABITS

(*Continued from page G-23*)

All other	14.0	10.6	11.9	15.6	12.9
Don't know	.5	—	1.0	.5	**

*Percentages total more than 100% because some people named more than one kind of thing. And the pattern by income class tells a story all its own.
**Less than 1%.

Nearly half the time—your radio set customer is making his first purchase at your store.

Number Answering	Total % 100.0
Had shopped there before and since	40.4
Had not shopped there before or since	36.5
Had shopped there before, but not since	15.0
Had not shopped there before, but has since	8.0

And what's more—over half of those who did buy—have not been back there since.

The customer seldom buys other items when purchasing his radio.

Number Answering	Total % 100.0
Bought something else at the same time	10.5
Did not buy anything else	89.4

But if he does, the chances are 2 out of 3 that it is Furniture, House-furnishings, or phonographic equipment.

If your prospect does not buy while he is in the store—here are the reasons.

Reason Number Answering	Total % 100.0*
Didn't like the ones seen	37.8
Model or style not available	31.8
Too expensive	28.5
Didn't have any radios	25.8
Made a better deal elsewhere	23.5
Preferred radio seen elsewhere	21.2
Wanted to shop around	3.7
Had no credit there	1.4
All other reasons	4.2
Don't know—no special reason	3.2

*Percentages total more than 100% because many people gave more than one reason.

SYLVANIA NEWS
Published By SYLVANIA ELECTRIC PRODUCTS INC.
Manufacturers of Sylvania Radio Tubes and Electronic Devices, Sylvania Incandescent Lamp Bulbs, Fluorescent Lamps and Equipment.
Vol. 13, No. 6 AUGUST, 1946
RETURN POSTAGE GUARANTEED

For: Mr. L. K. Moyer
22 Mercer Ave.
Doylestown, Pa.

A

POSTMASTER: If Addressee has moved, notify sender on Form 3547, postage for which is guaranteed. When Form 3547 is sent abandon this mailing. Return only if no correct address is available.

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A. V. BALDWIN
P. O. Box 431.
Associate Technical Editor
Emporium, Pennsylvania.

SCRAPBOOK OF ELECTRONIC PRODUCTS

The following products developed by the Electronics Division of Sylvania Electric, are now available to distributors. Listed are type numbers and product descriptions. Specifications and prices can be obtained from your Sylvania Distributor.

Type	Description
1N21B	Silicon Crystal Converter
1N23B	Silicon Crystal Converter
1N26	Silicon Crystal Converter
1N32	Silicon Video Detector
1N34	Germanium Crystal Diode
SN4	Strobotron
1D21	Strobotron
SS501	Gas Discharge Control Tube
R-1100	Thermocouple Tube
R-1111	Pirani Tube
R-1130B	Glow Modulator Tube
R-4330	Flash Tube
4C35	Thyratron
5C22	Thyratron
1B35	Anti TR Tube
1B37	Anti TR Tube
1B24	TR Tube
2J42	Magnetron

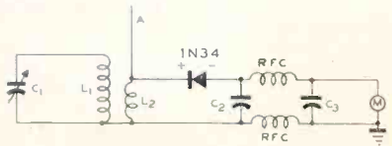
Power Measurement Lamps.

As occasion demands, this column will be utilized in presenting new developments from our Electronics division. In addition, we will bring you up to date on items we already have. Included will be interesting paragraphs on unusual applications of the enumerated items in such fields as television, medicine, etc. This time we present a — —

Field Strength Meter

For tuning up a rotary beam, try the Sylvania 1N34 Germanium Crystal Diode in the super-sensitive field strength meter (circuit diagram below) for a pattern. Try it and watch your QRK go up.

FIELD STRENGTH METER CIRCUIT



A	Telescopic pick-up antenna
C_1	100 μμfd variable capacitar
C_2	0.001 μfd mica capacitar
C_3	0.001 μfd mica capacitar
L_1	Barker and Williamsan type JEL plug-in cail
L_2	Link an abave
RFC	2.5 mh. r.f. chake
M	Simpsan 0-100 μa micraammeter

Diagram Courtesy W1MXX

SYLVANIA NEWS

SEPTEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 7

In This Issue:

COMMENTS . . . .

By BOB ALMY

OPA Maximum List Prices

A 20% increase in the list prices of radio tubes became effective August 23rd. Previously, on March 15th, 1946, prices to radio tube distributors were increased by 20%. At the same time the OPA established a new dealer cost schedule which provided for this increase in distributor cost to be absorbed approximately 20% by the distributor and 80% by the dealer. This most recent move by the OPA, setting up a new dealer cost schedule and a 20% increase in list prices, in effect restores the original distributor and dealer percentage of profit margin. This was required by the amended Emergency Price Control Law. Obviously, the ultimate consumer absorbs the pyramided price increase on this new basis.

While radio repairmen and dealers have generally welcomed the additional revenue obtained, especially while shortages of tubes and other merchandise exists, there is some feeling that tube prices of many types are too high. Some resistance is being encountered in selling the consumer a new tube or a complete complement of tubes for his radio because of the price as compared to the original cost of his set.

The present radio tube price structure is such that eventually it may require a complete overhauling or adjustment to keep the business in a healthy condition for all concerned.

Tube Delivery Picture

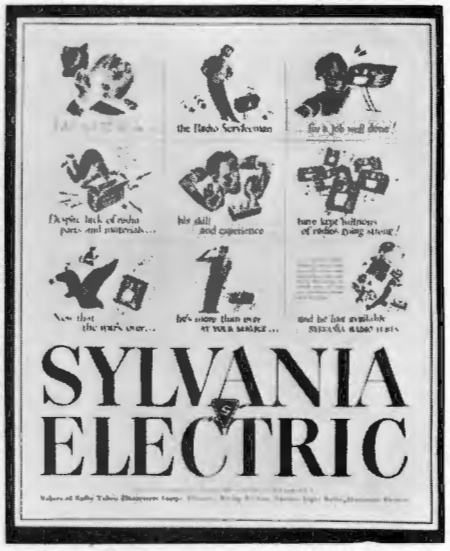
Tube manufacturers are now faced with still another production problem. Due to a strike situation the bakelite powder used in the moulding of radio tube bases is not obtainable from normal sources. While this situation will not affect production of lock-in and miniature types, which are not equipped with bakelite bases, it will affect other types such as the G, GT and standard glass. It is believed that existing stocks of various base styles are limited and drastic curtailment in production of the types involved will result. To what extent and for how long a period is contingent on settlement of the labor difficulties and resumption of bakelite powder deliveries.

(*Continued on page G-28*)

DOES THE RADIO SERVICEMAN KNOW HIS BUSINESS? "PM" SAYS YES!

Several years ago a survey was conducted to determine the "honesty" of the radio serviceman's charges. These original investigators disconnected wires in a radio set and took it to a series of servicemen to see what the estimate would be. In many cases, it took the serviceman some time to find the trouble for he went through the usual test routine, assuming the "customer" had honest intentions. Charges were based on an hourly rate. The result: the survey maintained that the charges were exorbitant.

Is the accusation true? New York City's "PM" says NO! In a survey recently conducted by the paper, it was reported that 55% of the shops investigated did not charge unfair prices. A set, actually defective, was taken to ten radio repairmen for cost estimates—all but two agreed with the estimate made by the Electronics Corporation of America before the survey began. Additional charges levied by some shops were for additional services rendered. The 45% "not recommended" were not necessarily "gyps" but were allowing for increased costs. PM's survey indicates that THE RADIO SERVICEMAN KNOWS HIS BUSINESS. Thanks again to the radio serviceman for his job well done especially during the critical war period (see above).



Sylvania's "Radio repairman Survey" conducted last fall reported that: with 30,000,000 radio repair jobs per year, 92.5% of the set owners were completely satisfied and 89.3% said that charges for the work were fair!

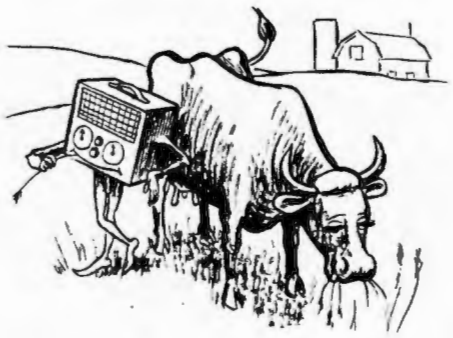
FARM RADIO MARKET

Three Out of Every Ten Farms Without Radios

The U. S. Census Bureau reports that in 1945, seven out of every ten rural farm dwelling units in the United States had radio receivers. This information was contained in the 1945 Census of Agriculture. The figures are reported to be typical of the nation.

Of the 6,319,000 families living on farms, it is reported that 76.2%, or 4,815,000 families owned a radio. Plus the fact that 330,000 farms had no dwellings on them which poses a possible future radio market potential, it is to be noted that the overall farm radio market is increasing in the post-war period.

The number of "radio homes" varies of course, from farm to farm and according to geographic location. In Massachusetts, 93.2% of the farm dwellings had radios, while in Louisiana, only 56.4% or 101,000 had radios.



SYLVANIA NEWS

MERCHANDISING SECTION

SEPTEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 7

ON THE VALUE OF KEEPING BUSINESS RECORDS

Bookkeeping As A Basis For Planning

Probably the most important element of a business campaign is planning. The very definition of the word "campaign" would suggest it. A man couldn't sell apples on the street corner from one day to the next without determining how many apples he will need to sell. No business, however small, can be conducted without planning.

There are plans formed around guesses as to what will happen in the future. These obviously are "unsound plans." Sound plans are based on past experience under specific conditions — with future activity modified accordingly. This is old fashioned common sense.

Business records are indispensable to a well organized business. Financial "looking ahead" involves a scrutiny of yesterday's operations. There are five chief reasons for the keeping of business records:

(1) To record progress or failure—and then do something about it.

(2) To collect what is coming to you.

(3) To secure credit, and to interest others in your business. Neat and precise records are indicative of an efficient, successful business.

(4) For tax purposes.

(5) To control buying and selling.

Job Record Cards

To control selling, or radio servicing properly, there are two inventory methods generally employed, the running and the periodic. "Running" inventory involves making a record of every sale or servicing job that crosses your counter. This sort of record is unweildy for selling small radio parts because of the large quanities involved. The extra effort of a daily check is unproductive. A periodic check on stock is perfectly satisfactory. Once a month should do the trick.

For servicing radios however, an on-the-spot record of the business transacted is necessary. This might be dubbed, "stub control" for there

Job Record Card

are three stubs involved in each transaction. Such a system may be set up around the Sylvania job record card, which is being used by thousands of successful servicemen throughout the country. In its "Multiplying Pennies" folder, Sylvania lists the job record card—the three part card shown above. It is made up of a customer's claim check and his receipt with the serviceman's imprint on it. There is also a card for your files. You may have your name, address and phone number imprinted. Following is the price schedule:

100	$1.00
250	1.75
500	3.00

The top part of the ticket is the customer's claim check with your imprint on it, stating: "Your radio has been accepted by us for repairs and we guarantee to give it our expert attention." Space is allowed for the date when the set will be ready.

The middle unit is the set owner's warranty and record. It is generally kept with the radio after the set has been taken home. Your name is imprinted on this part of the job record card to remind the set owner to whom to go for future servicing. Your job record card (3″ x 5″) has space for your record of repairs made, parts used, cost of materials etc.

Sylvania also offers to its servicemen a three-in-one service form No. 223 in the "Multiplying Pennies" folder. It is a complete record for your file, a customers invoice and guarantee and an imprinted follow-up card, all in one handy form, perforated for easy use.

Here is the price schedule:

100	$1.50
250	2.50
500	4.00

3 in 1 Service Form

Stock Records

Stock Records in the form of periodic inventories are necessary for keeping adequate stocks of radio

(*Continued on page M-26*)

ON THE VALUE OF KEEPING BUSINESS RECORDS

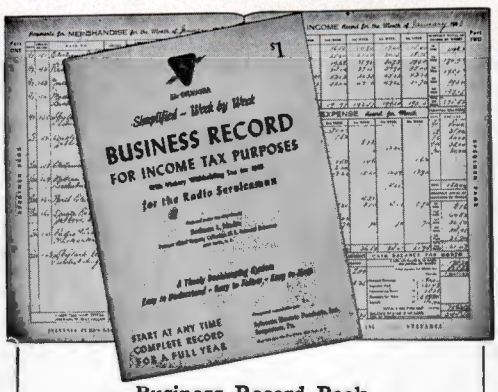
(*Continued from page M-25*)

parts. A record of last month's sales helps you plan how much of what items to stock next month. A sub-classified record aids in determining whether you need to stock more condensers and less resistors, etc., or vice versa. This makes for a high stock turnover. It means you will get more from your invested dollar. It limits stock depreciation.

Records are also essential to a good buying job. Such a record is an order blank. Buying records prevent misunderstandings with your distributor. They permit you to stipulate terms of your order and enumerate your shipping instructions. A record of the goods received is the basis on which your inventory controls and payments are founded. A system for buying control will involve merely, a folder for order blanks (filed according to date payable), a book to record bills paid and a folder for receipted bills.

Sylvania Business Record Book

To help you know whether your "success graph" is rising or falling, collect what's coming to you, to assist you with your income tax brow-knitters, Sylvania offers its Business Record Book to radio servicemen. THE SYSTEM IS AS SIMPLE A ONE AS COULD BE DEVISED. It is easy-to-keep, easy-to-understand, especially prepared for Sylvania by Mr. R. L. Modra, Former Chief Deputy, Collector of U. S. Internal Revenue. The system need not be started at the first of the year—you may, and should, start it NOW. The cost of this simple bookkeeping system is only $1.00. Your Sylvania Distributor has a copy for you.



Business Record Book

Important features of the business record book include:

(1) A day by day and week by week record of all money taken in.

(2) Similarly there is a column for the listing of your week by week expenses, with a final "Cash Balance For The Month" column.

(3) If you have one or more persons working for you, the law requires that you keep a payroll record. This includes wages paid out and amounts withheld (for social security and withholding tax). There is space in the record book for commissions paid which is to be deducted in computing your tax.

(4) A complete yearly summary by months of the items mentioned.

(5) A simple, easy to figure, profit and loss statement for the year.

(6) Easy to follow instructions on how to fill out your income tax return.

(7) The book includes simple instructions and specimen forms for the pay-as-you-go withholding tax.

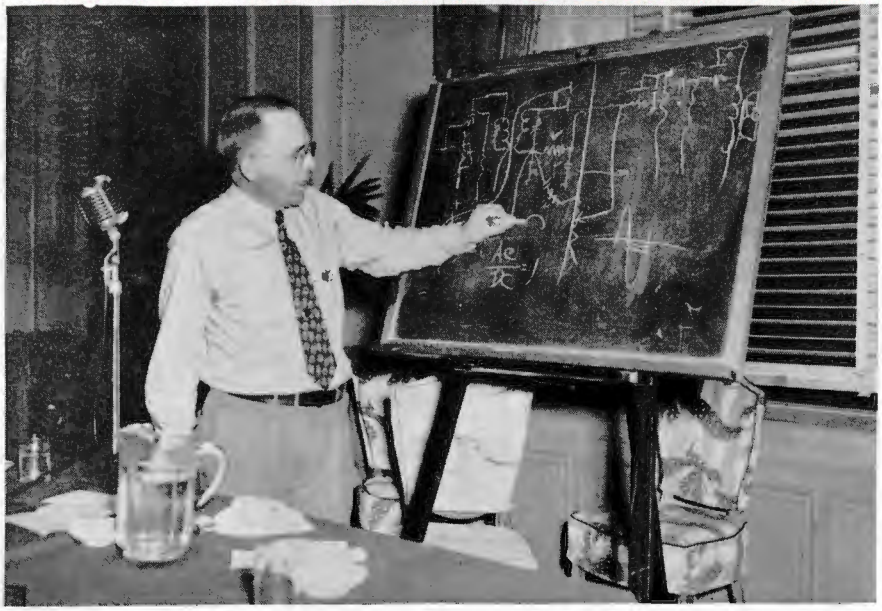
(8) Tax calendar and record of tax payments.

(9) Record of bad debts charged off during the year and schedule of depreciation.

Of the many features of Sylvania's Business Record Book, remember that its simplicity is its most important one. It takes as little time away from your actual servicing as possible. By keeping these records up to date, you will be saving yourself time, money and worry in the long run.

Keeping records will take thought on your part. But it needn't be a hardship. The time you spend with your records will be many times repaid in expense and tax savings and 'peace of mind'.

SYLVANIA SERVICE MEETING



Walter Jones Illustrating His Talk On Cathode Ray Oscilloscopes

The 1946 summer round-up Sylvania Service meeting was held last June 26th in Newark, New Jersey, complete with refreshments and door prizes, sponsored by Dale Radio, Sylvania Distributor in New York, Connecticut, and New Jersey. Feature speaker of the evening was Walter Jones, Chief Engineer of Sylvania's Radio Tube Division. Mr. Jones discussed the practical application of cathode ray oscilloscopes for signal tracing in radio set servicing. This subject is important in the servicing of conventional medium-wave broadcast receivers, and is becoming increasingly vital to the servicing of FM and television receivers.

Over four hundred servicemen attended despite sultry weather.

SYLVANIA NEWS

TECHNICAL SECTION

SEPTEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 7

NEW SYLVANIA POLYMETER

MULTI-PURPOSE INSTRUMENT DESIGNED AND MANUFACTURED BY SYLVANIA

Last month we announced and described two models of Sylvania Tube Testers. This month we are announcing the Polymeter, the latest addition to the new Sylvania line of service instruments. Poly, of course, is a Greek prefix referring in this case to the many ranges required in an instrument designed to measure all the values of current, resistance and voltage needed in service work. It is truly many meters in one.

Table I lists the ranges, ratings and accuracy of the various scales.

From this it can be seen just how useful this instrument will be for servicemen. The high frequency probe (which uses one of the first of the commercial versions of the famous Sylvania proximity-fuse style tubes) has such a low capacitance that it can be relied upon for accurate work in the FM and Television bands.

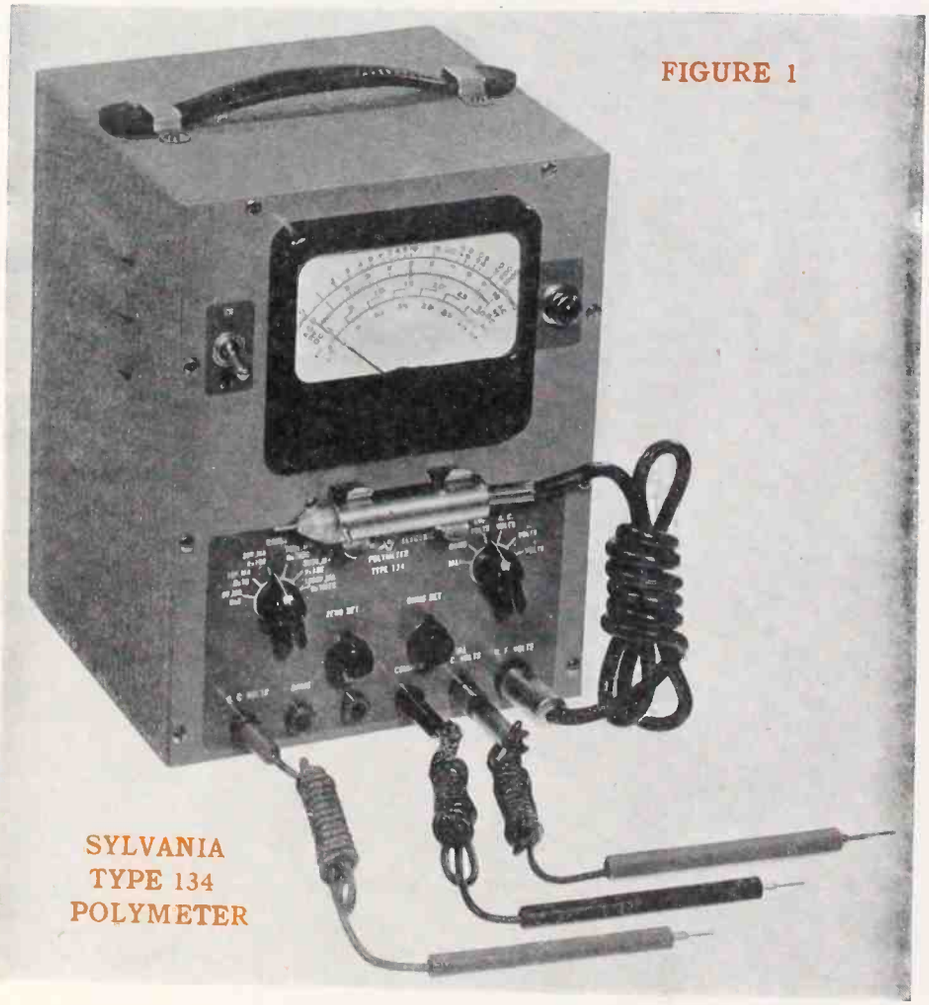
Although this instrument is rated within the stated percent accuracy up to 300 mc a typical calibration curve for the 3.0 volt range (Figure 2) shows that this is a conservative rating. The technique of voltage measurement at high frequencies is quite tricky, but comparative measurements may be suitable for many purposes where absolute accuracy is not required. One of the troubles encountered in high frequency measurements is with resonance due to the capacity and inductance in the probe and the leads to it. Short leads are essential for use above 30 mc and Sylvania has designed the probe to use the smallest tube and the shortest leads possible. This gives a resonant frequency well above 300 mc, but the use of too long a lead to the probe could overcome the advantages of this good design and give the user some misleading results.

The probe tube is known as Sylvania Type 1247 is only $1\frac{1}{2}$" long with a nominal diameter of $\frac{3}{8}$". This tube has an input capacitance of 3 $\mu\mu$f which we believe to be much lower than in any other similar instrument on the market today. The circuit complexity and difficulty of initial calibration may not lend itself to duplication by those who wish to make their own. Replacement type 1247 tubes will be available. An instruction book accompanying each instrument contains the complete circuit together with calibration procedure for the user's reference.

One feature which is unusual in vacuum tube voltmeters is that factory adjustments are provided which permit the meter to be correctly set at zero for all ranges with only one zero adjustment control on the front panel. The other adjustment shown in the illustration, Figure 1, is the ohmmeter setting required to compensate for changes in the voltage of the small 3.0 volt battery used in the ohmmeter circuit.

In addition to the special socket provided for the probe lead there are 5 jacks into which the test leads may be plugged to read A.C. volts, ohms, D.C. volts, Milliamperes and Amperes. The selector switch applies the signal to the correct circuit and a range switch selects the correct multiplier for the value to be read. (*Continued on next page*)

FIGURE 1



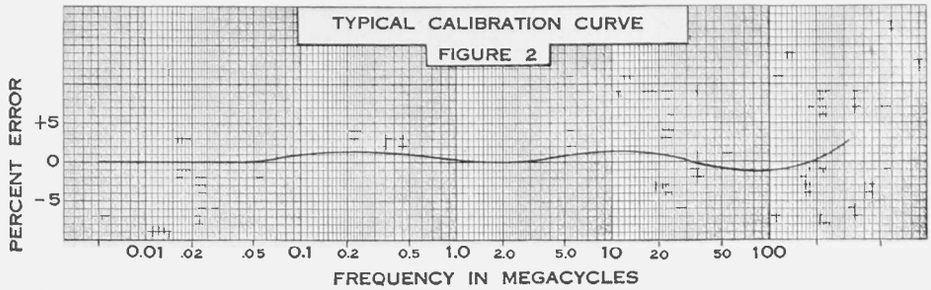
SYLVANIA
TYPE 134
POLYMETER

POLYMETER (*Continued*)

Circuit Details

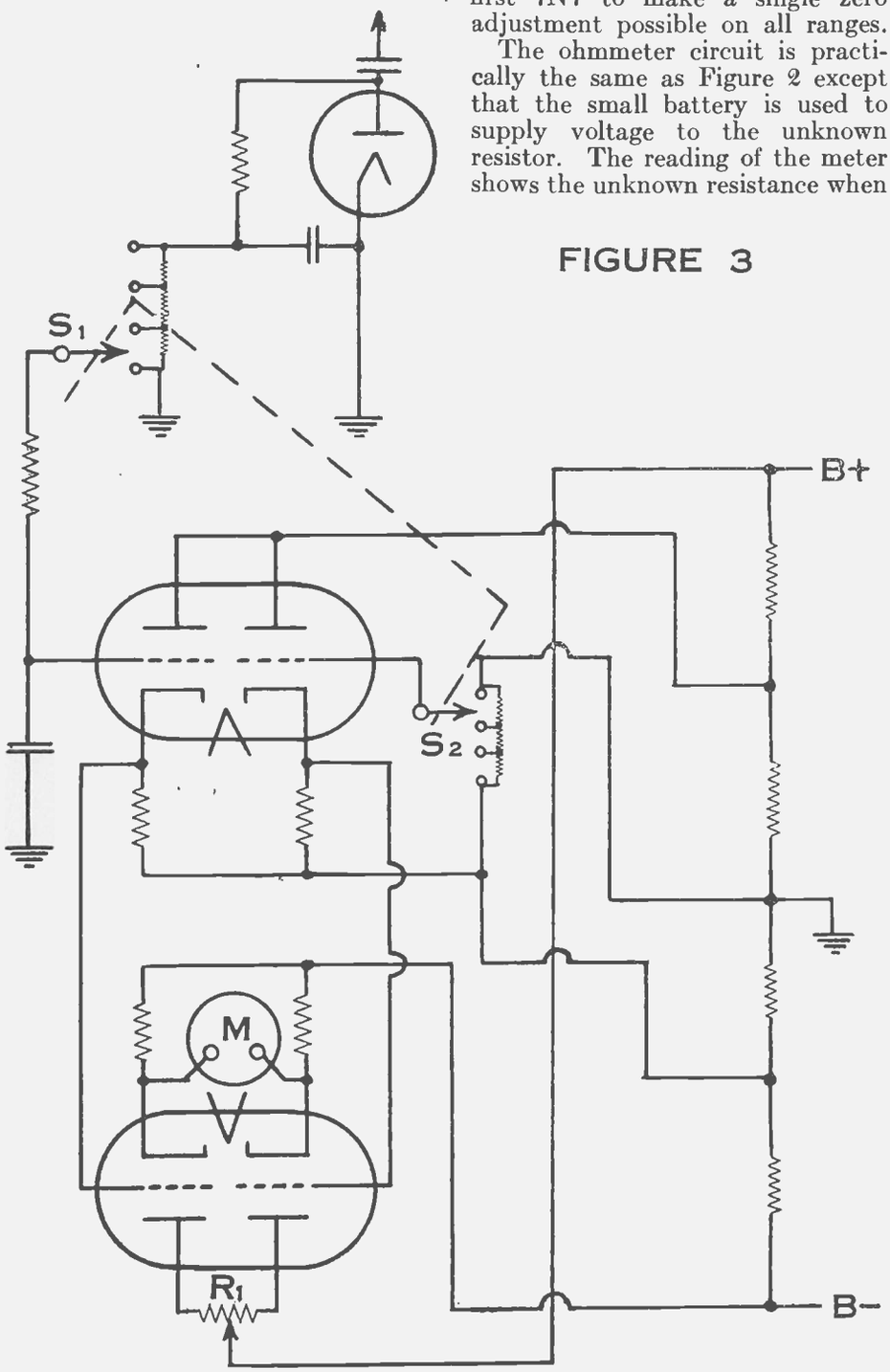
Figure 3 shows the fundamental circuit of the vacuum tube voltmeter as used with the probe tube. The balanced circuit amplifier using two Sylvania type 7N7's is practically independent of tube or line voltage variations. The potentiometer R1 is the balancing adjustment for the zero set. The use of a separate switch S2 operating on the same shaft as the range selector switch S1 allows the use of a different grid circuit resistance and voltage in the second half of the first 7N7 to make a single zero adjustment possible on all ranges.

The ohmmeter circuit is practically the same as Figure 2 except that the small battery is used to supply voltage to the unknown resistor. The reading of the meter shows the unknown resistance when current flows in the circuit containing the known and unknown resistances.



This VTVM circuit has unusual stability due to the use of rather low plate voltages and the balanced amplifier, and will not drift or change calibration after the initial three-minute warming up period.

FIGURE 3



FUNDAMENTAL PROBE CIRCUIT

TABLE 1

D. C. Voltages	Ohms per volt	Accuracy
0-3	5,333,333	± 3% of full scale
0-10	1,600,000	
0-30	533,333	
0-100	160,000	
0-300	53,333	
0-1000	16,000	
A. C. Voltages:	**Audio (capacity 40 uuf.)**	
0-3	900,000	± 5% of full scale
0-10	270,000	
0-30	90,000	
0-100	27,000	± 7% of full scale
0-300	9,000	
A. C. Voltages:	**R.F. 300 mc with probe capacity of 3 uuf.) (at frequencies up to**	
0-3	900,000	± 5% of full scale
0-10	270,000	
0-30	90,000	± 7% of full scale
0-100	27,000	
0-300	9,000	± 10% of full scale
Current	**Resistance**	
0-10 amps	.015 ohms	± 5% of full scale
0-1000 ma	.150 ohms	
0-300 ma	.50 ohms	
0-100 ma	1.5 ohms	± 3% of full scale
0-30 ma	5.0 ohms	
0-10 ma	15.0 ohms	
0-3 ma	50.0 ohms	
Resistance	**Current Required**	
0-1000 ohms	300 ma @ 0 ohms	± 6% on first half of scale
0-10,000 ohms	30 ma @ 0 ohms	
0-100,000 ohms	3 ma @ 0 ohms	
0-1 Meg.	0.3 ma @ 0 ohms	
0-10 Meg.	30 ua @ 0 ohms	
0-1000 Meg.	0.3 ua @ 0 ohms	

NOTE—RF accuracy from 100 to 300 mc is 5% greater than the above figures

Limitations

There are very few limitations to the use of this instrument within the accuracy as specified in Table I. It is extremely unlikely that servicemen will encounter R.F. voltages in excess of 300 which is the maximum safe voltage which should be applied to small diode tubes. When reading small R.F. voltages which are superimposed on high D.C. voltages it will be necessary to use an additional series condenser if the D.C. voltage exceeds 500 volts, the rating of the blocking condenser used in the instrument.

It should be pointed out also that

(*Continued on page T28*)

NEW—SYLVANIA TYPE X7018 MODULATION METER

FIGURE 1

The Sylvania Type X7018 Modulation Meter is a new addition to the line of Sylvania products. This instrument will be of chief interest to the radio amateur, although it may be used in conjunction with transmitters operating in marine, police and other services within its useful frequency range of 1.8 to 54 megacycles.

This instrument, when properly installed and adjusted, will indicate directly the operating modulation percentage of any amplitude modulated transmitter operating within its useful frequency range. In addition, carrier shift during modulation can be detected and a headphone jack is provided so that an audible check of distortion and hum can be made. Modulation percentage will not be indicated during aural checks since the meter is disconnected from the circuit when headphones are plugged in.

Type X7018 meter, as shown in Figure 1, is supplied in a compact grey crackle finished cabinet with a sloping panel for convenient use on the operating desk. No power supply connections are required since Sylvania Type 1N34 Crystal Diodes are used. A hermetically sealed meter calibrated from 0 to 120 percent modulation serves as the indicator. The portion of the scale from 100 to 120 percent is colored red to indicate overmodulation. On the front of the instrument below the meter are two toggle switches. The one on the left switches the meter from the RF to the AF circuit while the one on the right reverses the audio circuit to read either positive or negative modulation peaks as desired. The circuit is given in Figure 2.

A trimmer condenser is mounted on the left side of the case to allow convenient adjustment of the input circuit to the transmitter frequency. The phone jack is located on the right hand side of the cabinet for use in aural checking of the transmitter.

A one or two turn coil should be used to link couple the instrument to the final amplifier through the 10 foot length of 75 ohm transmission line supplied for this purpose. Terminals for connecting this line are provided on the back of the cabinet. The terminal marked "G" should be permanently connected to a good ground.

Initially, the coupling to the final amplifier should be very loose to avoid damage to the instrument through excessive RF power. Gradually increase this coupling with both toggle switches up, noting at each trial that the trimmer is adjusted for peak input until the meter reaches 100% for voice modu-

(*Continued on next page*)

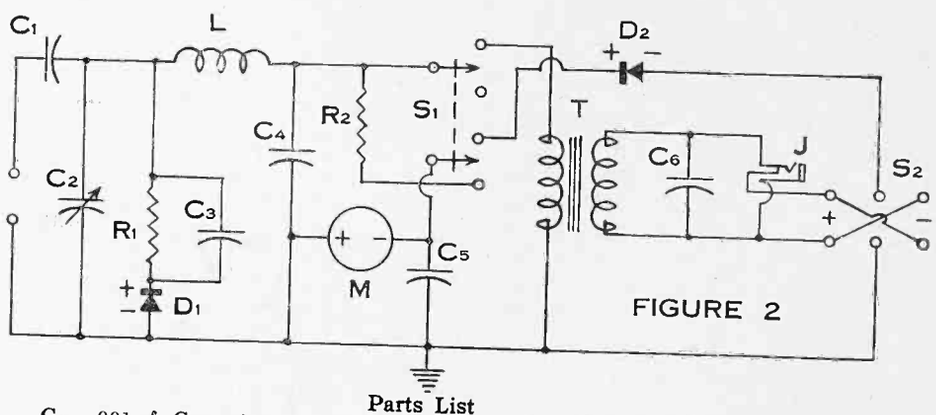


FIGURE 2

Parts List

C_1	.001 μf. Ceramic	D_1	Sylvania Crystal Diode 1N34
C_2	100 μμf. Variable	D_2	Sylvania Crystal Diode 1N34
C_3	12 μμf. Mica	L	20 μh. RF Choke
C_4	.001 μf. Ceramic	M	0-1 Ma. Special Scale
C_5	470 μμf. Mica	S_1	DPDT Toggle Switch
C_6	.01 μf. Ceramic	S_2	DPDT Toggle Switch
R_1	1000 Ohms ½ W.	T	Special Transformer
R_2	11000 Ohms 1 W.	J	Closed Circuit Jack

SYLVANIA MODULATION METER *(Continued)*

lation, or 70% if a sine wave tone modulation is to be used. Caution: make link coupling adjustments only when the transmitter is turned off. If the transmitter frequency or power is changed, the adjustment procedure given above should be rechecked. The trimmer adjustment alone can only compensate for minor changes and serious errors may be introduced unless the adjustments are properly made.

After the carrier level is set to the proper reference point as given above, throw the left hand toggle switch downward to the AF position. Now the meter will read modulation percentage directly. During ordinary speaking the meter will read about 20% lower than the modulation peaks because of the inertia of the meter movement. Allowance should be made for this to prevent short bursts of over-modulation.

To check "carrier shift," the left hand toggle switch should be returned to the up or RF position and the meter reading noted both with and without modulation. Only a slight difference will be noted if the transmitter is operating properly. If more than a 2 or 3 percent change in carrier level is shown by this test, transmitter trouble is indicated and a check should be made. The "Radio Amateur's Handbook" is a good source of information for correcting this trouble. Since the meter essentially compares the carrier and audio levels "carrier shift" can seriously interfere with the accuracy of readings.

"Lop-sided" or unsymmetrical modulation can be detected by noting the readings first with the righthand toggle switch in the up or positive position and then down or negative position. Normally the positive peaks will be of chief interest during operation because they can exceed 100%, while the negative peaks are cut off at this point.

By plugging a pair of good quality headphones into the jack provided, the operator can hear what is going on the air. Hum, distortion, noise etc. is immediately apparent and it is unnecessary for the operator to rely upon outside reports to determine modulation quality.

Undoubtedly, many further uses will be found for this instrument such a neutralizing indicator, field strength measurements, detection of standing waves or feeders, and others. When used as a modulation indicator, care should be taken to prevent stray coupling to the transmitter. Only pickup through the link circuit from the final amplifier will give accurate readings of modulation percentage.

The Sylvania Type X7018 Modulation Meter is a product of our Electronic Division. It is now in production and initial deliveries will soon be made to Sylvania Distributors throughout the country.

SYLVANIA POLYMETER *(Continued)*

while it is possible to use the probe for low frequency measurements there would be considerable error at 60 cycles since the probe design has been optimized for best performance at higher frequencies. Any change in the probe constants to improve low frequency response would lower the high frequency limit.

The input impedance of 16 megohms for D.C. measurements was selected as the best compromise between the erratic behavior which could have been caused by use of a much higher value and the too low an impedance used in some of the earlier models of vacuum tube volt meters. Notice that in Table I the ohms per volt varies with the scale used. This is typical of the better electronic voltmeter circuits and we rate it this way to avoid giving misleading ideas. It means exactly the same as stating that the input resistance is 16 megohms on all ranges.

Deliveries

Shipments of Sylvania Polymeters have started and limited quantities are now available through Sylvania distributors.

SERVICE HINTS

Philco 46-1209 Dead on Broadcast.

In Philco Model 46-1209, the large blue wire that runs from the range switch to the loop aerial coupling coil, is run under the edge of the tuning condenser. The tuning condenser was installed after this wire was connected in place and this wire should have been dressed away from the condenser, but wasn't and consequently when the bolts that held the condenser were tightened the frame of the condenser cut into the insulation but not enough to produce an immediate short. However, after this radio is used for a while the insulation finally gives way and the radio is dead on the broadcast band, but works fine on short waves. On account of the low resistances of the circuits involved this defect is rather difficult to locate.—Donald Slattery, Chardron, Nebraska.

* * *

Information Wanted: Many of us acquired a German special service radio while in Germany. This is a portable radio, Model K60 Norwegian-Luftwaffen Koffer K32 GWB. The schematic obtained does not give the IF frequency. We assumed 483 kc to be correct, but it does not seem to work out. Can any one give us the correct IF frequency for this receiver?—D. B. Hanel, Hanel's Hobby Shop, P. O. Box 706, Martinsville, Va.

Dead Silvertone Model 7001. Within the past month and a half we have had come into the shop six silvertone model 7001 A.C. sets. The symptoms have always been a dead set. In five of these six sets the trouble was traced directly to an open resistor in the filament circuit. The troublesome resistor is a white, uncolorcoded resistor mounted on terminals almost directly in the center of the set. All that was needed to repair the sets was to replace the resistor with another 50 ohm resistor of 5 watts rating. This procedure should save much time ordinarily spent in checking tubes and the line cord for open circuits.—James J. Skiles, St. Louis, Missouri.

SHOPS O' THE MONTH

BRUBAKER, THE RADIO (WO)MAN

Now let it be said that a woman can very successfully fill a business man's shoes. Ken Sloan, Sylvania's Arizona distributor tells the story of a radio serviceman—with skirts—and a very competent service (wo)man she is.

Mrs. Maxine Provost Brubaker's activities are indicative of the energy and ability with which she runs her late husband's radio shop.

Mrs. Brubaker is a graduate of the University of Arizona with a B.S. degree in Business Administration. She has been a high school teacher and has served in the Arizona House of Representatives during its fifteenth and sixteenth sessions. She was Chairman of both the Labor and the Educational Committee.

Ed Brubaker started the business some fifteen years ago, a World War I veteran. Today Mrs. Brubaker is keeping the business going—same location—same good service.

She plans to make the shop into a "Car Radio Sales and Service Center" with a circular driveway and a display "island" in the center of it.

"Being a woman and running a radio service shop has its problems," Mrs. Brubaker says. "My service men are married and have one 'boss' at home. One should be enough for any man."

SERVICE AT LINDY'S

As well as being an expert radio repairman, Olin Centofanti of Paulsboro, New Jersey is an accomplished builder of radio repair benches.

His new bench is constructed of ⅜ inch plywood except for a 2 inch bench top. The bottom is recessed 10 inches to give plenty of foot room. The compartments underneath are used to store larger parts and the drawers for tools and small parts. All power outlets plus two 6 volt DC outlets are in the rear to prevent tripping over the wires.

The instrument panel is attached to the wall rather than the bench to prevent shock to the instruments. This panel compartment is about 11 inches deep. The power outlet panel is 4 inches deep. All panel instruments are removable from the front for servicing. The instrument panel is in three sections. The center panel is available to two men working at the same time.

Mr. Centofanti has added an AC probe to the volt ohmist, a three inch oscilloscope and a capacity resistance analyzer to the bench. "I built the RC analyzer from an article in the Sylvania News," he reports. "It promises to be one of the handiest instruments on the panel."

AN EAR FOR MUSIC

Posed in their Automatic Phonograph Department are, from left to right: Hugh Brown (chief serviceman), John Holt, Alfred Scott, and Jennings Scott (owner).

One of the larger dealer-service outfits being served by Sylvania's distributor, Chemcity Radio and Electric, is Scott's Music Service of Charleston, W. Va.

The success of this concern is due to the business ability and the aggressiveness of Jennings Scott, owner. He started the business in 1942 and has serviced over nine thousand home and auto receivers since that date. But in addition, he has added a wing to his radio servicing business. His shop is also the operator for more than one hundred Wurlitzer Automatic Phonographs.

Starting business during the war period, Mr. Scott found it difficult to get Sylvania tubes to fill all of his needs. But as always, Sylvania has supplied them as fast as they were available. Mr. Scott expresses a strong preference for Sylvania products.

When prosperity comes, do not use all of it. —Chinese Proverb

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Power dwells with cheerfulness.
—R. W. Emerson

BRAINSTORM DEPARTMENT

Hand-Made Compressor

From Decatur, Texas Theodore Kendrick writes: "I've been in this radio service business for seventeen years without realizing the value of an air compressor in a service shop. I guess I never would have begun using one if it hadn't been for the war . . . when we had to begin finishing cabinets.

So I built one without it costing me a cent. An old compressor from an electric refrigerator and a ten gallon pressure tank combined with a motor and a guage enables me to build up eighty pounds of air pressure in the tank in ten minutes. The unit is a lifesaver when it comes time to clean a radio set, the workbench or other hard-to-get-at places. I won't be without one again.

I also attach a small paint gun to the compressor to put a finish on small plastic cabinets, etc. This idea may prove helpful to some of the men coming out of the service and back into the radio servicing business.

Yours truly,
Theodore Kendrick"

Tool To Remove C Retaining Rings

Generally when something goes wrong with a band switch, dial drive assembly or volume control, a serviceman will replace the whole unit rather than try to repair it. But for those who have undertaken the repair job, there were, probably, headaches involved trying to remove the C retaining rings on the unit.

For those with the headaches, Jake Hoover of San Angelo, Texas suggests the use of a small hand tool (see cut) to remove the retaining rings.

Mr. Hoover concluded his letter: "Saw The News for the first time in four years last week. Must say, it's getting better. The radio serviceman still has the same old friend to hand out those helpful suggestions and ideas.

Yours truly,
Jake Hoover"

NUMBERED RECORD FORMS

What about numbering your job record cards? Many servicemen have said that it was a big help in locating record forms by number rather than by the name on each card.

The job record card and the three-in-one service form that Sylvania offers to its servicemen have a space into which the job number may be written. But they are not pre-numbered along with the service of imprinting your name and address on the cards.

An additional charge is needed for numbered cards. The extra cost to you for numbered cards would be out of proportion to the time and energy saved.

BUT IT IS POSSIBLE FOR YOU TO NUMBER THE CARDS IN YOUR OWN SHOP AND WITHOUT THE EXTRA COST. Numbering machines are obtainable at your local stationary store for as low as $5.00. The cost of the machine would be absorbed through the saving in the printing costs for your business cards. Errors would be eliminated and time saved. Your numbering machine could also be used for numbering of invoice forms, purchase orders, tickets, etc.

SYLVANIA DISPLAY CARTONS

Sylvania Dummy Cartons, discontinued during the war because of paper shortages, are now once again ready to do a selling job for you through store and window displays (see cut).

Many novel displays can be built

up with this new, modern Sylvania Carton. The cartons are especially adaptable to mass displays in your window or on your counter, piled into pyramids of varying design. They will give an added sales punch to any counter or window display.

ON THE COVER

Star of NBC's tele-airways is the sparkling "Miss Venus" (her real name is Evelyn Peterson) from San Antonio, Texas. She last appeared in "Window Shade Review," NBC's "Television Theatre" feature presentation.

NEW PRICES - TUBE AND SERVICE STICKERS

Increased cost of materials make it necessary for us to establish a new price schedule on Sylvania tube stickers and service stickers. This new price schedule, which becomes effective October 1, 1946, is as follows:

Item #110—Tube Stickers with imprint, 2,000—$2.35
Item #114—Tube Stickers without imprint, 1,000—75c
Item #117—Service Stickers, with imprint, 1,000—$1.50
2,000—$2.50

GEORGE CONNOR

Electronics Sales Manager

George Connor

George C. Connor has been appointed General Sales Manager of the Electronics Division of Sylvania. His office is at 500 5th Ave., New York City. Mr. Connor will be responsible for the merchandising and sale of electronic products including special tubes, measurement controls, strobotrons, thyratrons, photo tubes and custom-built precision equipment.

Mr. Connor has been with Sylvania since 1934. During the war, he was liason agent between Sylvania and the government on the engineering development of radio and radar products. In 1943, he became manager of the California Division equipment sales.

To the radio serviceman George Connor is especially well known for his instructive and entertaining Sylvania Radio Service School Lectures. He has addressed servicemen in almost every large city in the country and has been listened to by radiomen from hundreds of hamlets and villages from coast to coast.

Scrapbook of Electronic Products

Improved Recording Dilatometer

August 12th, the Electronics Division of Sylvania Electric announced its improved recording dilatometer, to permit the continuous, automatic measurement of the thermal expansion of a wide variety of materials. They include metals, glass, ceramics and plastics.

This instrument was an important factor in attaining the glass to metal seal which characterizes the famous Sylvania lock-in tube. Finding the exact expansion characteristics of glass and developing the correct metal alloy to match (Allegheny Ludlum No. 4) was in many respects made possible by the Sylvania Recording Dilatometer.

It can be important in many fields such as the steel industry, aircraft body and engine design, automotive, industrial machinery and many others.

The dilatometer will accommodate temperatures up to 1000 degrees Centigrade. It is based on the

Sylvania Recording Dilatometer

original design and development of Walter E. Kingston, Director of the Sylvania Metallurgical Laboratories.

Silicon Crystal Converters

Silicon Crystal converters, ¾ inch long and ¼ inch in diameter, for use as first detectors in high frequency superheterodyne receivers, have been developed by the Electronics Division of Sylvania. New microwave applications may include: use

Silicon Crystal

as rectifiers in wave meters, monitors and field strength meters as well as detectors in portable shf receivers.

The crystals, permanently pre-set in their minute cartridges, are available in three types designed for frequencies up to 10,000 megacycles. These converters require no filament or heater supply, taking only a fraction of the space of a vacuum tube. Low thermal noise and i-f impedance are additional attributes of the crystal converter.

Type 1N21B has a frequency of about 3000 megacycles. Ratings are as follows: conversion loss, 6.5 db. max.; thermal noise ratio, 2.0 max.; i-f resistance impedance, 200 to 800 ohms. Corresponding characteristics for type 1N23B and 1N25 crystals are as follows: 10,000 mc. and 1000 mc.; 6.5 db. and 8.5 db.; 150-600 and 100-400 ohms.

CURTIS HAINES NEW PRESIDENT OF WABASH

Curtis A. Haines, has been appointed president of Wabash Corporation, Sylvania's photo lamp subsidiary.

Wabash is the leading manufacturer of photoflash and electroflash lamps and makers of Superlite, infra-red and Birdseye reflector lamps.

Mr. Haines has been with Sylvania since 1929. In 1942, he was appointed General Manufacturing Manager in charge of the manufacture of the T-3 tiny tubes used in the Navy's "VT" radio proximity fuse.

When the war ended, the plants under Haines were supplying 100% of all the T-3 tiny tubes used for proximity fuses.

DON MITCHELL
MEMBER OF NATIONAL DISTRIBUTION COUNCIL

To the end that American industry shall improve its efficiency and distribution capacity, the National Distribution Council has been organized. Don Mitchell, president of Sylvania Electric, has been elected to the newly organized group.

The National Distribution Council is a voluntary group of twenty-nine whose activities will be coordinated with those of the government.

SYLVANIA FINANCIAL REPORT
HALF YEAR SALES TOTAL 28 MILLIONS

Sylvania Electric and its wholly owned subsidiaries report a net profit of $980,732 for the quarter ending June 30th. This is $114,155 more than the profits for the June 30 declaration for 1945.

Sales during the first half of this year totaled $28,187,728.

COMMENTS . . . by BOB ALMY (Continued from page G-26)

Battery Types

As indicated in this column last month, deliveries of the critical demand battery types should continue to improve over the balance of the year. It may take several months to supply the backlog of demand but the situation on these types should gradually improve.

Two New Items Added To Sylvania Electronic Equipment Line

In the technical section we are announcing two additions to our line of modern electronic equipment.

The Sylvania Polymeter and the Modulation meter—both designed and produced by our Electronics Division. We are confident that in the Polymeter we have provided a very useful instrument for the radio repairman. Your Sylvania Distributor will be glad to show it to you.

Facts and Figures . .

New Prices For Quality Sets

Effective August 19th, O. P. A. restored discounts and retail margins on radio receivers and phonographs to the former March 31, 1946 level. A 3% rise was granted for medium and higher priced sets. However, the change did not affect the lower price brackets, nor sets already in the hands of distributors.

Copper Production Doubled

It is reported that the production of copper for the month of June is 33,085 short tons. Mine production for July is put at 53,317 short tons. Full production is expected to be underway by October at the latest.

Musical Buses

There are plans afoot to install radios in intercity bus lines. Music while you ride . . . a new field for radio servicing.

Nation's Production Moves Ahead

In his sixth and seventh report to the President and the two houses of Congress, the Director of War Mobilization and Reconversion reports . . .

. . . that total civilian production now stands at the highest level ever reached by the Nation in war or peace: an annual rate of more than $150,000,000,000.

. . . that war payrolls and federal purchases were down more than one third in the first quarter of 1946 as compared to the fourth quarter of 1945—to $26,000,000,000.

. . . that civilian output and employment is rising rapidly despite the 2,500,000 added to the civilian labor force against a withdrawl of only 800,000 war time workers. Nonagricultural employment increased by approximately 1,500,000 since the end of 1945—greater than a comparable war period. In the first quarter of 1946, consumer and business purchases equalled those of the Christmas boom. Ordinarily, there would have been a ten to twelve billion dollar fall-off.

. . . that in the coming quarter, there will be a rise in consumer expenditures due to the availability of supplies. This will mean a reduction of inflationary pressures.

SYLVANIA NEWS
Published By SYLVANIA ELECTRIC PRODUCTS INC.
Manufacturers of Sylvania Radio Tubes and Electronic Devices, Sylvania Incandescent Lamp Bulbs, Fluorescent Lamps and Equipment.
Vol. 13, No. 7 SEPTEMBER, 1946
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A. V. BALDWIN . . . . . Associate Technical Editor
P. O. Box 431, ... Emporium, Pennsylvania.

SYLVANIA NEWS

OCTOBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 8

In This Issue:

COMMENTS . .

By BOB ALMY

List and Cost Prices Increased Approximately 14% Effective October 28, 1946

The OPA has issued revised order #619, under revised maximum price regulations 136, establishing new maximum prices on radio receiving tubes sold for replacement use. This new order, which became effective October 28, 1946, sets up a new schedule of retail ceiling prices (list prices), and resale prices (dealer cost prices). These schedules are included as an insert in this issue of Sylvania News for your convenience. Additional copies may be obtained from your Sylvania Distributor.

The new schedules represent an increase of 14% uniformly in each price bracket, except that dealer cost prices have been rounded out to the nearest cent and list prices the nearest nickle. At the same time, distributor cost prices have been increased by 14%. Thus, the profit margin percentage at dealer and distributor levels has not changed, although the actual amount of profit has been increased.

There has been some indication that the radio industry will be decontrolled by OPA before the first of the year. But, there has been no official announcement. Certainly, decontrol will come eventually. When this happens it may be found desirable to revise the present price structure on radio tubes, particularly in regard to list prices of certain types. The replacement cost to the consumer for a complete complement of tubes in several cases is out of line with the original cost of radio sets. As discussed in the September issue of Sylvania News, the set owner is likely to think twice before agreeing to have tubes replaced at today's prices. We will be very pleased to receive comment on this subject from any of our readers.

Delivery

In general deliveries of tubes for replacement have improved. But a shortage of bakelite bases, resulting from labor difficulties in the bakelite industry, is curtailing production of many tube types which are constructed with bakelite bases. The full effect of this have not yet been felt, but it will be soon.

TELEVISION DEVELOPMENTS

Sylvania Contributes To Television Research

Dr. R. G. E. Hutter of Sylvania's Research Laboratories in Flushing, Long Island, has arrived at formulas that will make possible improvements in the control of distortion in television tubes. Dr. Hutter and his assistants have been investigating ways in which an electron beam is focused and deflected in a cathode ray tube. Dr. Hutter read a technical paper on the subject at the recent Electronics Conference in Chicago.

Dr. R. M. Bowie, Manager of Research for Sylvania, invented the ion trap to prevent ion spots (burning of the screen) in high voltage television tubes. Dr. Hutter is employing the basic principles of the ion trap to dislocate ions from an electron beam without deflecting the beam. This is accomplished by means of combined magnetic and electrical fields.

Greater Range For Video

A way to extend the range of ultra short wave radio and radar transmissions is expected to develop from the Navy's study of the effects of weather changes on high-frequency radio transmission. Television's range may be extended from its present 150 miles to a possible 2000 miles. Study is based on the hypothesis that the wide variation in the range of high-frequency radio waves is due to weather conditions.

To determine what frequencies would best relay transmissions under varying weather conditions, 200 foot towers relayed waves along a path flanked by weather recording instruments.

Weather forcasting by radio transmission may be possible by this method. For atmospheric changes have already been recorded more rapidly than by the best meterological instruments.

SYLVANIA DISPLAYS TUBE AND TUBE CHECKERS AT DALE CONFERENCE

One thousand retailers, dealers and factory executives gathered at the Hotel Pennsylvania the second week in September for Dale Distributors' two-day luncheon, conference and exhibit.

An important feature of the merchandising exhibit was Sylvania Electric's tube display (see cut). Pictured before the display is Rene Jacobs, executive Vice President of the Dale Organization.

Dale is well known among metropolitan New York trade, having distributed Sylvania radio tubes for the past fourteen years in that area.

SYLVANIA NEWS

MERCHANDISING SECTION

OCTOBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 8

RADIO SERVICEMEN'S PROFIT MARGINS

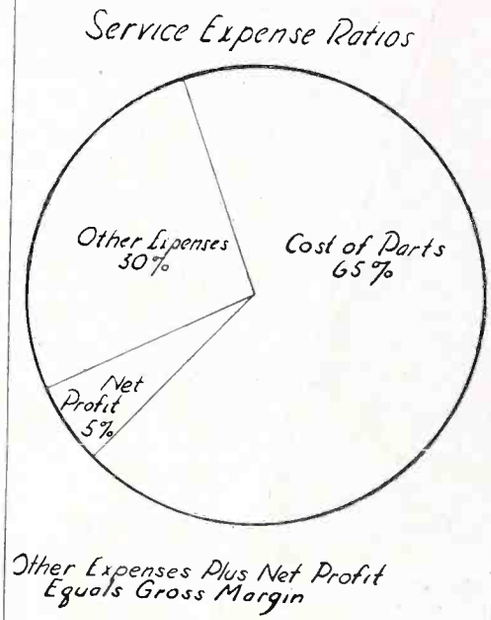
This is another article in a series on how to be a better business man.

There is more to running a successful radio repair shop than just servicing sets. In fact, other aspects of the business take as much care and skill in their handling as does a good service job.

Take this matter of profit margins. In order to realize the greatest profits from your servicing business, it is necessary to know how to set your profit margin, your servicing charges, and know how to maintain a high stock turnover. Your grasp of the problem depends upon your understanding of the ratios of the shop's operating figures.

First of all consider "gross margin." Gross margin is the difference between servicing profits and the cost of materials. Realize that other expenses involved in keeping a service shop going (salaries, advertising expenses, special services, rent, depreciation costs) have not been subtracted from the "gross margin." Until that has been done, you do not have the true net profit. Your gross margin must not be spirited away in the form of cut prices, etc. until other expenses of doing business have been deducted. For example, if it is determined that 65% of servicing expenses should be allocated for costs of materials and parts used. That will leave a gross margin of 35%. From the 35%, 30% will go for other expenses of doing business (salaries, advertising, etc.) leaving a net profit of 5%. As the profit is a small percentage of the gross income, the matter of setting the margin need be undertaken with considerable care.

Gross margin is based on sales price and vice versa. Once a proper margin is selected, servicing charges may be set by subtracting the margin from 100% (the selling price.)



High Stock Turnover Will Increase Net Profit

Stock turnover affects profits as readily as do profit margins. "Stock turnover" indicates the number of times supplies of materials and parts are completely moved from your shelves each year. A high turnover may be the result of a decreased inventory or an increased number of service jobs. But which ever is the case, a high stock turnover means good business and more profits.

Profits may be improved without increasing the number of service jobs handled . . . that is, by reducing your inventory. If you bought parts just once a year, your inventory investment would be ten times greater than if you bought the same quantity of parts upon ten different occasions. The net profit would remain the same, yet your net profit per dollar of investment increases. However, the principle is applicable only up to a certain point. Do not decrease your stock below the point where you will no longer be able to do a speedy, quality servicing job.

In addition, high stock turnover will reduce your costs ordinarily subtractable, because of depreciation of old stock and cost of obsolescence. High stock turnover is particularly important to servicemen without a good deal of storage space.

In the end, proper attention to ordering, to insure fast turnover, will increase your net profits as would an increase in your number of service jobs.

"These little pocket radios are nice, but I've had quite a lot of trouble with mine!"

Reprinted from LOOK. *America's Family Magazine*

SYLVANIA SELLS YOUR SERVICING

Today, penny wise radio men know that servicing is their best merchandise. For the country has undergone four long years of war—four years without new radios. Those radios are war-weary. They are in dire need of servicing.

Sylvania realizes the tremendous number of servicing jobs that lie ahead for radio servicemen. Sylvania has made plans for the future: (1) to make quality radio tubes for servicemen as fast as possible; (2) to help repairmen sell their service. To that end, Sylvania has created quantities of store identifications and sales promotion helps, to let your neighborhood know that you are there to doctor their ailing sets.

Remember that your window display is an important medium through which to "educate" your neighborhood. The shop (see cut) has taken advantage of Sylvania service helps and molded them into an eye-appealing window display which is the best advertisement the shop has,—it sells its servicing.

In the display are dummy tube cartons attractively pyramided, a Sylvania advertisement appearing in national publications the country over, window stickers and a large weather-proof service banner. These items and many others may be obtained from your Sylvania distributor.

PHILADELPHIA ORGANIZES ITS RADIO SERVICEMEN

P.R.S.M.A. BENEFITS THE PUBLIC AND THE SERVICEMAN

Philadelphia's solution to radio servicing difficulties is its P. R. S. M. A. The Philadelphia Radio Service Men's Association is composed of a group of practical, far-sighted radio repairmen who realized the need for an organized system of public information, the necessity of protecting the public from unscrupulous practices and in general, the need to put radio servicing on the plane of a highly skilled profession.

Because there are so many war-weary sets that need servicing and because competent servicemen are at a premium, P.R.S.M.A. carries spot announcements over Philly's WFIL six times daily, instructing listeners to notify the radio station of needed repairs. Calls are routed to a radio serviceman nearest the home where the servicing is required.

One of the purposes of P.R.S.M.A. is to raise radio servicing standards. The organization has a Pennsylvania State charter, probably the first such charter granted to a non-profit organization.

To the same end, prospective members of the organization must undergo rigid membership examinations. The P.R.S.M.A. has co-operated with the government in apprehending black marketeers.

P.R.S.M.A. is organized to the end that the radio public will get the best service possible. The most efficient shop methods are maintained by members of the group. A basic "diagnosis fee" is maintained so that the actual charges for fixing a set may be kept at a minimum.

P.R.S.M.A.'s latest contribution to radio servicing is its television school, a twelve week course that began the first week in September. The course will give Philadelphia's radio servicemen a basic groundwork in television repair including lectures on television installation, maintenance and operation. P.R.S.M.A. plans to supplement this course with a more detailed coverage of the subject.

Philadelphia is proud of its radio servicemen's organization. And it has every right to be. Similar groups are organizing in other cities.

SYLVANIA NEWS

TECHNICAL SECTION

A. V. BALDWIN, *Technical Editor*

OCTOBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 8

NEW SYLVANIA SELENIUM RECTIFIER

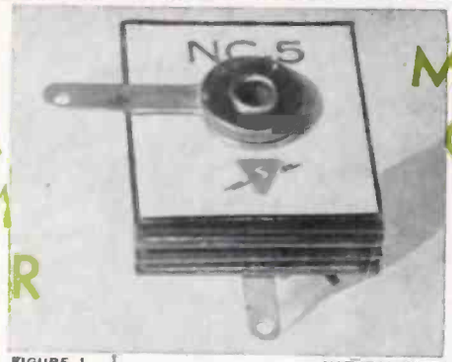


FIGURE 1 NATURAL SIZE

MORE HELP ON YOUR REPLACEMENT PROBLEMS

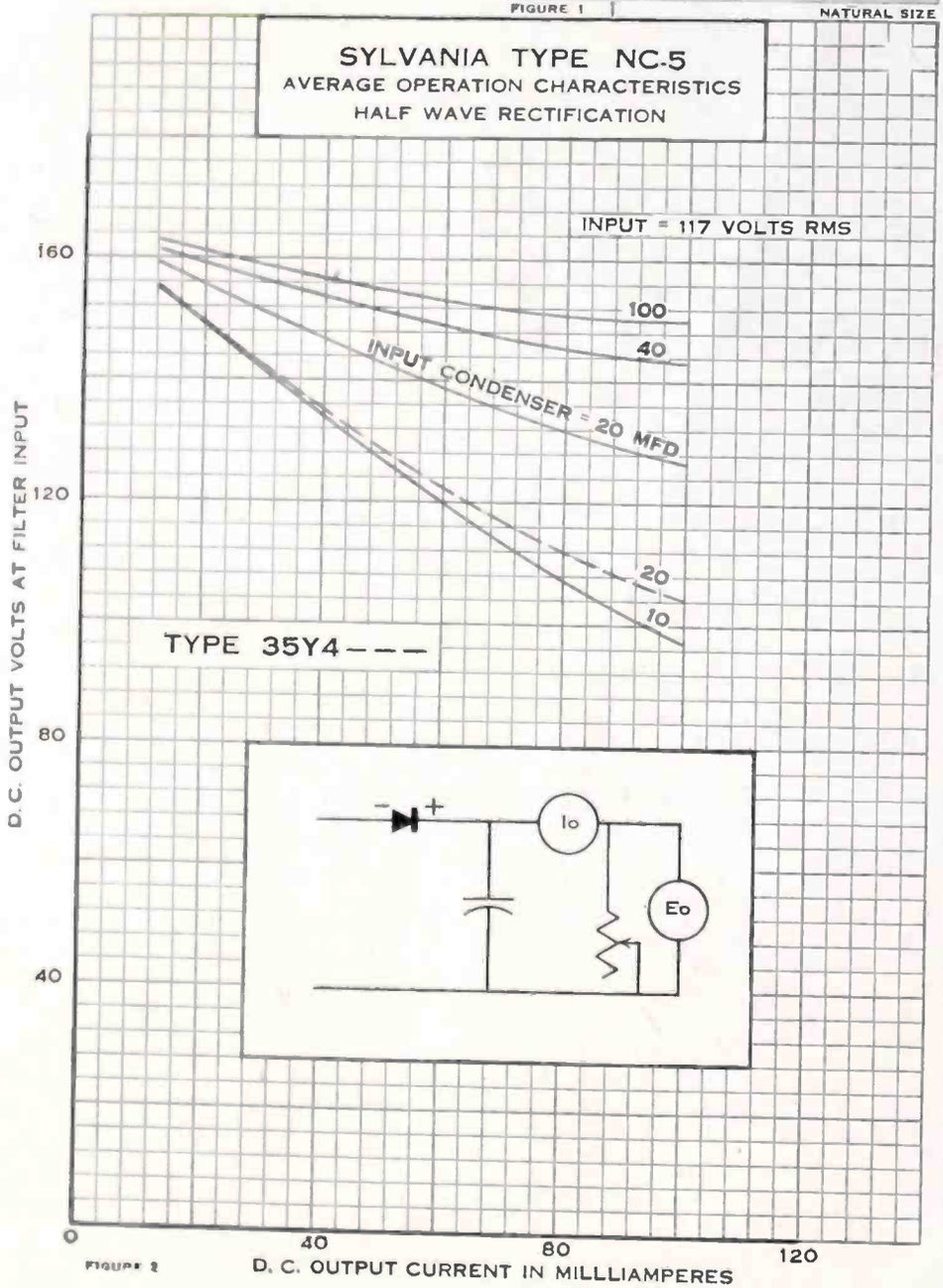


FIGURE 2

The present scarcity of the higher filament voltage rectifier tubes will make the announcement of the Sylvania type NC-5 Selenium Rectifier particularly interesting to servicemen. Figure 1 shows a picture of the complete unit. It mounts anywhere on the chassis by one bolt and requires no socket. The actual size is 1¼ inches square and 1 1/16 inches thick. Selenium rectifiers are similar in construction and performance to the copper-oxide disc rectifiers which have been familiar as battery chargers for years. When made for radio use 5 discs are used in series as the maximum operating voltage is only about 76 volts per disc. This is the factor that so far has made their use as replacements for type 80 and similar tubes too expensive.

Characteristics

The typical load curve for the Sylvania type NC-5 Selenium rectifier is shown in Figure 2. For comparison the load curve for a Sylvania type 35Z3 has been shown dotted. Note that for the same filter capacity the selenium rectifier gives about 20 volts more output. This higher voltage is obtained because the thin film in which rectification takes place has much less resistance than the smallest practicable spacing that could be used in a vacuum tube.

Ratings

Maximum applied voltage rms AC (design center)	117 Volts
Maximum inverse Voltage	380 Volts
Maximum peak current	1200 ma.
Rectifier Drop (Approx.)	5 Volts
Maximum DC output	100 ma.

When the rectified current is examined by means of an oscillo-

(*Continued on page T-31*)

Sylvania Type 7R7

RESISTANCE COUPLED AMPLIFIER DATA

Self Bias Operation

	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.2			0.47		0.1		0.27			0.47	
Rc_2	0.39		1.0			1.8		0.39		1.0			1.8	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	1200	1200	2700	2700	2700	4700	4700	470	470	1000	1000	1200	1800	1800
Ib	0.61	0.61	0.271	0.271	0.271	0.163	0.163	1.75	1.75	0.75	0.75	0.74	0.44	0.44
Ic_2	0.173	0.173	0.076	0.076	0.076	0.044	0.044	0.49	0.49	0.212	0.212	0.207	0.121	0.121
Ec_1	−0.94	−0.94	−0.938	−0.938	−0.938	−0.974	−0.974	−1.05	−1.05	−0.962	−0.962	−1.14	−1.01	−1.01
Ec_2	32.5	32.5	23.5	23.5	23.5	20.5	20.5	59	59	38	38	43	32.1	32.1
Eb	39	39	26.9	26.9	26.9	23.4	23.4	75	75	47.5	47.5	50	43	43
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	7.8	8.9	8.0	10.2	12.2	9.6	12.5	13.6	15.5	15.4	19.8	22.0	19.5	25.5
Gain	78	89	80	102	122	96	125	136	155	154	198	220	195	255
% Distortion	4.6	4.3	5.0	3.8	3.0	5.2	3.9	2.2	2.1	2.8	2.1	2.0	3.0	3.1
Esig (1)	0.11	0.11	0.1	0.1	0.1	0.1	0.1	0.22	0.22	0.15	0.15	0.2	0.14	0.14
Eout	8.55	9.8	8.0	10.2	12.2	9.6	12.5	29	33	22.5	28.0	41.5	26.4	34.5
Gain	77.8	89	80	102	122	96	129	132	150	150	187	207.5	189	246.5
% Distortion	5.1	4.6	5.0	3.8	3.0	5.2	3.9	4.8	4.3	4.5	3.8	5.0	4.7	4.4

Note (1). For self bias operation this is taken at the grid current point with less than ½ microampere grid current.

SYMBOLS USED

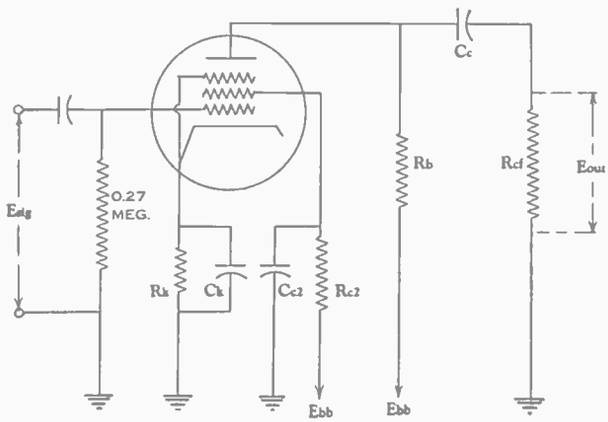
Symbol	Function	Unit	Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms	Esig	Input Signal	R-M-S Volts
Rcf	Grid Resistor of following tube	Megohms	Eout	Output to following grid	R-M-S Volts
Rk	Cathode Bias Resistor	Ohms	Ib	Plate Current	Ma.
Ebb	Plate Supply Voltage	Volts	Ic_2	Screen Grid Current	Ma.
Eb	Plate Voltage at plate	Volts	Ck	Cathode by-pass Condenser	mmf.
Ec_1	Grid to Cathode Voltage	Volts	Cc	Coupling Condenser	mmf.
Ec_2	Screen Grid Voltage at screen	Volts	Cc_2	Screen by-pass Condenser	mfd.

Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

$$\text{For low frequency limit} = f_1 \quad Cc = \frac{1.6 \times 10^6}{f_1\ Rcf} \text{ mfd.}$$

$$Ck = \frac{1.6 \times 10^6}{f_1\ Rk} \text{ mfd.}$$

Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.



SELENIUM RECTIFIER (*Continued*)

scope it can be seen that the reverse current is very small, probably about 3% of the forward current value, and becomes even lower after a few hours' use.

Life

These units show a gradual improvement in rectification efficiency for the first few hundred hours and from then on the performance seems to be perfectly flat for 10,000 hours or more. They can be considered good for the life of the radio unless accidents happen. Failure of the first filter condenser or other accidental short will damage the selenium rectifier just as much as a tube in a similar situation. They are perhaps a little more tolerant of occasional short overloads than a tube, but are more critical with regard to the temperature of the space in which they operate. Confinement in too small a space which results in a temperature about 75°C. (168°F.) will cause very short life. When bolted under a typical small chassis the metal conducts the heat away sufficiently to keep the temperature down to 50°C.

Advantages

When used in sets properly designed to take full advantage of the good features of the selenium rectifier the outstanding improvement will be the increased volume obtainable by reason of the greater voltage available to the output tube. It may be some months before sets using these as initial equipment are available since most of the standard tube line-ups included the rectifier heater voltage as a considerable portion of the series heater string. With the new rectifier, set designers will probably completely rearrange the tube complement rather than use a dropping resistor in place of the rectifier heater. In the type of AC-DC sets which used a 117 volt rectifier and battery type tubes in series, very few design changes will be required. Figure 3 shows a typical example of this. Another minor advantage is that in circuits using battery tubes the radio will start to play the instant it is turned on.

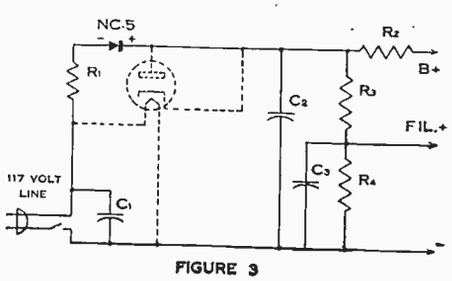


FIGURE 3

Use as a Substitute

Figures 3 and 4 show the changes required when using the Sylvania type NC-5 as a substitute for a rectifier tube.

In Figure 3 the heater circuit of the former 117 volt tube can be completely removed and the + side of the selenium rectifier connected to the cathode terminal and the − side to the plate terminal. It is important to increase the value of the resistor R1 to restore the voltage on the tube filaments to the proper value. It would be inadvisable in this case to connect the resistor in such a place as to use additional plate voltage since the tubes are already being operated at the maximum rated voltage. The added resistance should be about 25 to 30 ohms but may require adjusting slightly for different sets. The best way of making this adjustment is to use a 1000 ohm-per-volt meter to read the voltage across a 1.4 volt tube when the line voltage is exactly 117 volts. Adjust the resistance to get 1.3 volts under this standard condition.

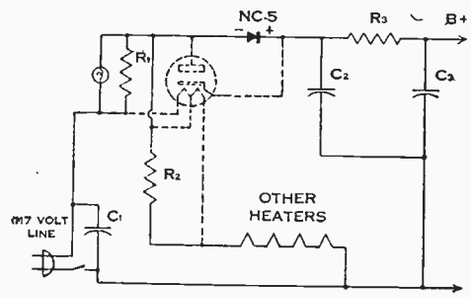


FIGURE 4

Figure 4 shows the changes required when using the Sylvania type NC-5 as a replacement for a 35Z5 or 35Y4 rectifier tube. The important item here is R2 which must replace the rectifier tube heater in the series string. Be sure to place this so as not to overheat other parts as it will dissipate considerable heat. Table I gives the values of R2 recommended for the most common rectifier tubes.

TABLE I

Type	Heater Current	R2 Ohms	Watts	R1 Ohms
25Z5	.300	85	15	Not required
25Z6	.300	85	15	Not required
35W4	.150	200	10	10 to 25
35Y4	.150	200	10	10 to 25
35Z3	0.150	230	10	Not required
35Z4GT	0.15	230	10	Not required
35Z5GT	0.15	200	10	10 to 25
45Z5GT	0.15	270	10	10 to 25
50Y6GT	0.15	330	15	Not required
50Z7GT	0.15	300	15	10 to 25

The values given for R1 are for use with one type 47 panel lamp and a total B supply drain of 60 ma. A lower value will be required if the drain is higher than this.

In using this substitution we are allowing the added efficiency of the selenium rectifier to be used in increasing the available plate voltage. This increase of approximately 20 volts may be more than the filter condenser can stand, particularly as the no-load voltage will be applied until the cathode type tubes warm up. The higher voltage may throw the set into oscillation which may need to be taken out by a little improvement in the screen by-passing by adding a screen dropping resistor. In most cases however the customer will be very pleased with the increased sensitivity obtained.

For use in the few sets where voltage doubling is employed two units will be required for replacement, each connected as explained above.

The possibility of using this to assist in substitutions for the hard-to-get rectifier-pentodes should not be overlooked. The type NC-5 can be tucked into some odd corner and the socket connections changed to accommodate any available output tube which will fit into the series string. Instructions for replacing the rectifier section will be the same as outlined above and output pentode changes are reasonably familiar to most servicemen today.

Precautions

Like most devices there are some disadvantages and certain precautions should be observed in using selenium rectifiers as substitutions. Probably the most important of these is that until the set manufacturers and the underwriters decide whether the peak current limiting resistor is sufficient as a "safety valve" to prevent fires it would be well to add a fuse in the side of the line which connects to the chassis. When tubes are used the cathode tab is generally the weakest link and acts as a fuse in preventing fires starting from shorted radios. The selenium rectifier is so rugged that even when it fails it still would carry more current than the wiring.

(*Continued on page 32-T*)

SELENIUM RECTIFIERS
Continued

Another precaution is to mount the unit rigidly and far enough away from other parts and wires that it will not touch them. The metal plates must not be allowed to short to anything and must have reasonably free ventilation. They may be mounted in a tube socket if desired but do not wind them with tape. In this case we suggest a perforated shield can surrounding the unit.

In any case it would be advisable to check the first filter condenser to be sure it is not going to fail as soon as the radio leaves the shop.

The Sylvania Type NC-5 Selenium Rectifier can be obtained through your Sylvania Distributor.

ADDITIONS AND CORRECTIONS FOR SYLVANIA TUBE TESTER CHART

These testers have now been on the market long enough that most of the initial errors have been found. The chart settings on the following types should be changed. The underlined figures are those which were incorrect.

TYPE	A	B	C	D	E	F	G	TEST
1LE3	1.4	0	–	0	1	6	17	V
1A7	1.4	0	–	0	1	039	30	V
					5	034	30	V
25Z5	25	0	–	0	1	—	18	Y
					6	—	18	Y
25Z6	25	0	–	0	1	—	18	Y
					3	—	18	Y
35W4	35	0	6	0	4	—	18	Y
	(added line)				2	4	—	18	Y
35Y4	35	0	4	0	1	—	18	X
	(added line)				4	1	—	18	X
35Z3	35	0	2	0	3	—	18	Y
	(added line)				6	3	—	18	Y
40Z5	50	0	2	0	3	—	18	Y
	(added line)				6	3	—	18	Y
The following new type may be added:								
2050	6.3	0	–	0	1	46	17	W

The following new type may be added: From the experience gained and users comments the following suggestions are being passed on to all our readers:

1. Follow operating instructions closely—READ THE BOOK FIRST to avoid confusion and blown protective fuses. Follow the prescribed testing sequence.
2. Certain tubes, such as cathode rectifiers, may indicate on GOOD part of scale when first tested but meter needle will drift from first position to the left. Frequently the needle will come to rest at different points on the scale. A tube which causes this is BAD.
3. If meter needle does not move upon first putting the instrument into operation, check line fuse or loose 1LE3 tube by removing panel from cabinet.
4. Many replacement parts are standard and can best be obtained from distributors. For example, the protective line fuse is a Buss, Littlefuse, or equal-type 3AG, 250 volt, ½ amp.; the neon shorts indicator is Westinghouse, or equal-type NE45.
5. In cold, dry climates the meter needle may come to rest up scale when instrument is turned off. This is due to static collecting on the meter glass. A slightly damp cloth will remove the static charge.

SERVICE HINTS

Alignment Suggestion

Any radio can be "hopped-up" considerably by placing the antenna wire or loop near a fluorescent tube and setting the gang to a non-station spot around 600 KC. Turn the volume well up and adjust the IF trimmers and LF padder for maximum noise. Shift the gang to a non-station spot around 1400 KC and trim the RF trimmers, only, for maximum noise. It is necessary that the IF and HF oscillator frequencies be approximately correct before employing the above stunt. Philip Rosenblatt, Hoboken, N. J.

* * *

Improved Test Prod

The common type of phono needle test prod is often too bulky for work on small sets. It is difficult to reach a terminal without touching others nearby. To prevent this trouble replace the needle with a piece of stiff wire about 2½" long pointed at the end. Cover all but the point with spaghetti, cemented in place. This prod will reach almost any terminal you can see and may be bent if necessary.—John M. Kilroy, Dorchester, Mass.

* * *

Locating Noisy Condensers: On several occasions, I have found arcing condensers to be the cause of rumble sounds and bad tone quality in radio operations. Procedure—disconnect one side of voice coil on speaker (Editors Note: It is best to substitute a 10 ohms resistor for the voice coil to prevent arcs in the output transformer.) then turn radio on. Turn volume up and listen for arcing sounds. Other arcing parts may be detected by this same method.—Charles L. Fryar, Euclid 19, Ohio.

More Service Hints Needed

Servicemen tell us that our "Service Hints" page is one of the most popular features of Sylvania News. Unfortunately the editors cannot write these, that's up to you, so send in those service hints you haven't got around to yet. Tube awards for accepted hints were resumed at the first of the year, but still they are not coming in fast enough. We can't promise to supply any scarce tube you request but there are small quantities available of a number of hard-to-get types.

* * *

Soldering Suggestion

We all have had trouble trying to solder a new wire, or to replace wires in a soldering lug when there are already several wires in the lug. By using an ice-pick and shoving it through the hole in the terminal while the solder is hot and holding it there until the solder is cool, you have a nice round hole to put a couple more wires in.—J. H. Moore, Youngstown 9, Ohio.

* * *

Tube Substitution

For emergency repair, a 5T4, 5W4 or 5Y3G can be substituted for an 80 by the following method.

Cut off all pins on the substitute tube except pins 2, 4, 6 and 8. Cut off all four pins of the defective 80 taking care not to damage them. Slip the two large pins from the 80 over pins 2 and 4, and the two small ones over pins 4 and 6. After carefully aligning with the octal pins, solder securely taking care that they extend about ⅜" beyond the octal key. If carefully done, the tube will fit nicely in the old socket. —Jerome Hamerling, New York 60, New York.

* * *

Zenith 10S669: Owner replaced all tubes. Set whistles over entire dial, but no reception. If metal 6K7 is being used, do not check set for open bypass or filter condensers. Look at 6K7 socket, no connection has been provided for number one pin leaving tube unshielded. Loop stiff wire on number one tube prong and solder other end to chassis.—Daniel Nardo, Baden, Pennsylvania.

SHOPS O' THE MONTH

For Good Service—A "Will" to Do a Good Job

"Extra services" gave Don LaGessee this successful looking shop

Of all the ways to get ahead in the radio servicing business, none is so important as "go-get-it." It means energy, ambition and a love for your work. We picked the following as Shops O' The Month, not because they were large or elaborate but because they had the "will" to do a better servicing job.

Don LaGessee of Garden City, Kansas branched out into service for himself back in 1939. Just plain service was not good enough for Don. For those "extra services" are what counts to a customer. So Don adopted the policy of doing every thing he possibly could on each set that came into his shop. Every set is cleaned on the inside and out, missing screws and knobs are replaced, scratches are removed. When a set is delivered, ground and aerial connections are checked. The delivery service is free. And these plus-services cost next to nothing.

Don launched his service-sales business in 1945. Now he has a record department as well. He was told a record department would attract the bobby-sox trade. It did. But what is more, they went home and told their parents about the shop. So now the whole family trades there.

Most interesting of Don's ideas is his drive-in radio repair service. While you wait, you may have a radio, radio aerial, noise suppressor or condenser installed in your car. Or have your car radio's minor aches and pains attented to.

Pre-fabricated Servicing

Mr. K. Seymour of Los Angeles, California is a "GI" back from the wars. Both he and his wife were in the radio servicing business in Chicago in pre-war days.

When Mr. Seymour returned, he found he couldn't just up and start a business. He had to find a place to set up shop. But that was next to impossible. That would have been the end of the idea for some. But Seymour erected a pre-fabricated aluminum building in which to do his servicing. He calls it the O-Kay Radio Shop.

That's what we mean by "go-get-it."

UNSNARL YOUR BUSINESS

ANTENNA SPOOLS SERVE DUAL PURPOSE

If your customer is ensnarled in his radio antenna—if there's a radio serviceman who believes he will benefit having his name in his customer's home—here's his chance.

Sylvania announces its new antenna spool, available to all servicemen through their Sylvania distributors.

Purpose: (1) to get antennas, permanently attached to sets, out

of the way while the radio is being serviced. (2) By leaving an antenna wound around this imprinted spool when repaired sets have been returned to their owners, customers will be reminded to come to YOU for complete radio service.

Prices complete with your imprint are as follows:

100	$1.25
250	2.50
500	4.00

BRAINSTORM DEPARTMENT

Kirtley Ervin Awarded Advertising Material

Kirtley W. Ervin of Middletown. Ohio submitted the following idea to the Sylvania News, an idea streamlining his radio repair business.

"I have prepared a number of flexible test leads equipped at both ends with insulated alligator clips." Mr. Ervin writes, "These leads differ in length and color to facilitate connections.

"When it is necessary to substitute parts in checking speakers or output transformers, it is simple to merely clip the leads onto the set being tested and to the replacement without taking them out of the cabinet. The leads may also be used to test external power connections and filter replacements."

Mr. Ervin said: "I have been using this idea for several years. I believe it has more than repaid me in time saved and money earned."

Mr. Ervin has earned five more dollars with his idea—Sylvania Sales Promotion items to help sell his servicing.

DID YOU KNOW . . . .

. . . that there now is a gauge to measure vacuum pressures down to 1/100,000,000,000th of a pound per square inch? This gauge will improve the efficiency and longevity of radio, television and other electronic tubes.

. . . that the proximity fuse used in radio-controlled shells, has a tiny generator spinning at 100,000 revolutions per minute? The tiny tube used in the fuse was developed by Sylvania Electric and has been called the second most important weapon of the war!

"RADIO WEEK" PLANNED

Of interest to the radio world is National Radio Week, planned for the week of November 24th to November 30th. An extensive program has been outlined for the week, including a nationwide check-up of war-weary sets.

THE NELSON SYSTEM

A System And Years Of Hard Work

The Nelson Radio and Supply Company, Sylvania Distributor, has a new home—451 St. Louis Street, Mobile, Alabama. The business was founded some twenty-three years ago by Eben Nelson and was so successful they have been able to move to a better location . . . . and an attractive store it is (see cut).

A degree of that success was due to years of hard work. A part to Mr. Nelson's system. The most important element of the system is the method of pricing. Every article on the floor (there is a self-service plan) is labeled with its retail selling and its net selling price. This method eliminates the cumbersome catalogue system.

Everything is labeled right down to the lowly fuse. "It might appear to be a tedious and costly job," says Mr. Nelson. "But the filling out of tags is done during the times we are not so busy. Now ten customers can be taken care of where only one could have been waited on before".

Feature No. 2 of Mr. Nelson's system is its self-service department. It is used for all types of radio parts, accessories, and test equipment. The self-service plan has tripled floor sales.

Mr. Nelson has also added a large parking space for the convenience of his customers.

All ambitions are lawful except those which climb upward on the miseries and credulities of mankind.

—Joseph Conrad,
A Personal Record

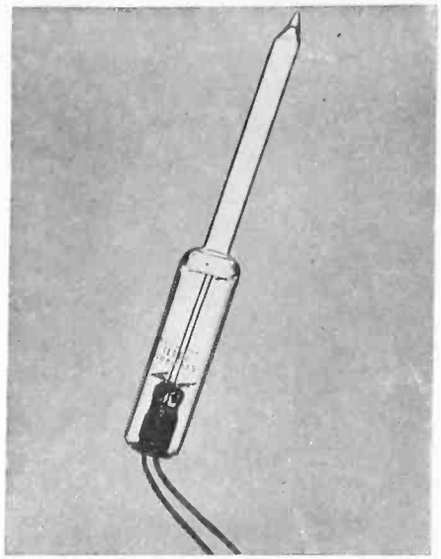
Order is Heav'n's first law: and this confest, some are and must be greater than the rest.

—Pope, Essay on Man, IV

A look into the Nelson Radio and Supply Company's new home

SCRAPBOOK OF ELECTRONIC PRODUCTS

Pirani Tubes



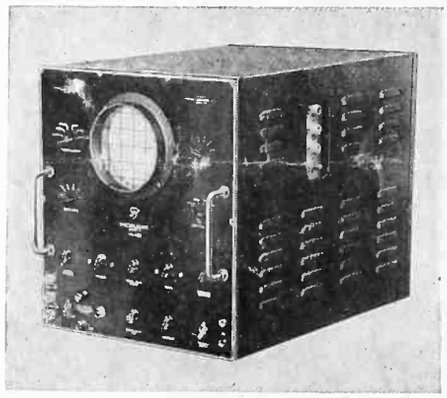
Pirani tubes are now available from Sylvania's Electronic division for use in leak detectors, evacuating apparatus and automatic recording equipment. The tube permits a rapid, continuous, direct reading of low gas pressures by virtue of the high temperature coefficient of resistance of its tungsten filaments. A charge in gas pressure induces a change in the tube's thermal conductivity, filament temperature and resistance. Measurement of filament resistance, calibrated in terms of individual gas pressures, is indicated on an 0-1 milliammeter placed in a bridge circuit. Matched pairs of Pirani tubes are recommended for greater accuracy. One tube is sealed directly into the evacuating system while the second, or compensating tube, is left intact, opened to the surrounding air or filled with a specific gas to a standard pressure. Tubes are usually mounted in close proximity to provide the same ambient and the installation is usually carefully shielded from radiant heat or air currents.

Readings may be obtained with a plus or minus accuracy of 5% within a pressure range of one to one thousand microns. The tubes are supplied in nonex glass envelopes with tabulation for direct sealing into the apparatus. Overall length of the tube is approximately eight inches. They are designed to operate at 1.5 volts and 100 milliamperes. Cold resistance of the filament is 6.6 ohms. Hot resistance at 100 milliamperes in an evacuated tube ranges from 15.5 to 17.0 ohms.

Synchroscope

The Sylvania Synchroscope has been designed for the visual examination of televistic periodic wave forms, pulse time, modulation, sonic depthfinders, geophysical exploration and Loran equipment. It is possible to investigate the amplitude, shape and duration of video impulses ranging from a fraction to several hundred microseconds with the instrument. R-f wave forms may be studied when the synchroscope is used with a television amplifier and r-f envelope viewer.

Many combinations of trigger and sweep pulses may be produced to



speed synchronizing pulses to a variety of external equipments at pulse repetition frequencies up to several thousand per second. Synchronized voltage waveforms are produced on the screen of the cathode ray tube for visual study.

Sweep speeds of 0.01, 0.05, 0.2, 1, 2 and 5 inches per microsecond with a minimum sweep amplitude of 4 inches on a 5 inch cathode ray tube are provided. The sweep may be started with external positive or negative signal; delayed up to 90 microseconds from internal trigger; or the sweep repetition frequency may be determined by internal or external trigger.

Internal trigger output characteristics provide a repetition frequency of 500, 1000, 2000, and 5000 p.p.s.: a positive pulse reaching 200 volts minimum in 0.3 microseconds, adjustable in time from 75 microseconds before to 25 microseconds after the start of the sweep.

The synchroscope is rated at 200 watts, 105-125 volts, 50-60 cycle a-c and is supplied with or without an r-f detector and video amplifier.

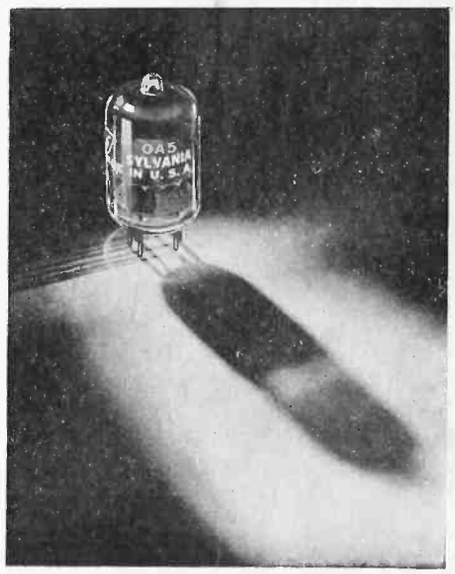
The instrument includes a five inch cathode ray oscilloscope, trigger generator for synchronization, space for the addition of a video amplifier and r-f envelope viewer, adjustable time delay phasing circuits, and seven input connectors and a selector switch for rapid viewing of separate external circuits.

OA5 Cold-Cathode Relay Tube

Leon Flanders of Sylvania's Electronic Division in Boston, writes regarding the new OA5 Cold-Cathode Relay Tube:

"The Type OA5 Cold-Cathode Relay Tube (formerly Type X-7027), has been designed by Sylvania for the triggering of the SN4 and 1D21 Strobotrons and the Sylvania Type R4330 and R4340 Flash Tube. The OA5 has been built into the Wabash Electroflash units. Besides furnishing a positive action, it eliminates the possibility of shock to the user and also reduces corroding of switch contacts by sparking, because of its very low trigger grid current requirements. Many additional relay applications are expected to develop.

(Continued on next page G-32)



SCRAPBOOK OF ELECTRONIC PRODUCTS

(*Continued from page G-31*)

The tube is a 1⅝" by ¾", five-element, internally triggered affair with a cathode construction similar to the SN4 and the 1D21 Strobotron tubes, but improved for relay or switching applications. The two latter types function as relay and stroboscopic tubes. The light from the arc may be adjusted in frequency to synchronize with mechanical motion. The OA5 however, cannot be used for stroboscopic work because of insufficient light-output. Yet like the strobotron tubes, it operates by conducting large peak currents occurring in pulses of relatively short duration so that the average current is low.

Salient features:

(1) Tube element is such that relatively stable electrical characteristics are maintained throughout the life of the tube. This precision firing is one of its important new features.

(2) Trigger grid current required to fire the tube has been reduced to a new low (40 microamperes). Thus, it is possible to trigger the tube from a photo tube or electric eye with out intervening amplifiers.

(3) The time lag in the firing of the arc after the triggering pulse hits the grid, has been reduced to a few millionths of a second.

(4) The anode operating potential runs as high as 1000 volts DC."

PRICE CONTROL OFF ALL TELEVISION SETS

OPA announced, September 13th, that price controls would be removed from television sets in combination with radio sets. Television sets not combined with radios had previously been removed from the OPA's jurisdiction.

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Manufacturers of Sylvania Radio Tubes and Electronic Devices; Sylvania Incandescent Lamp Bulbs, Fluorescent Lamps and Equipment.
Vol. 13, No. 8 OCTOBER, 1946

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HENRY JOHNSON SPEAKS ON SALES RESEARCH

Henry C. L. Johnson, Advertising Manager of the Radio, Electronics, International and Wabash Divisions of Sylvania, speaking before the the American Management Association in New York City, explained the use of sales research in advertising and sales promotion.

Research has always been an important element of Sylvania products. In addition to the extensive technical research carried on in its laboratories day by day, year by year, careful market analyses are made by its Sales Research Department.

Market potentials, consumer attitudes and trends are investigated in light of their relation to radio and television sets, radio tubes and parts.

This meticulous study of markets in which Sylvania products are to be sold, scientifically guarantees a sure footing for distributors, dealers and servicemen who sell Sylvania to the public.

ESLER AT BIKINI

Rochester's Fred Esler, one of Sylvania's outstanding radio dealers, participated in the US Navy's last atom bomb experiments at Bikini Atoll. Esler was in charge of the operation and maintenance of radiation instruments. These instruments were used to determine the degree of radio activity in the explosion area and to warn inspection parties of hyper-activity.

During the war, Mr. Esler's work in the field of electronics, contributed to the development of a device at the University of Rochester to check the muscular reaction of poliomyelitis victims.

ON THE COVER

Jack Benny, jocular jokester, and Fred Allen, master buffon, have wiggled back into their jesters' gloves—for their summer vacations are over. September 22nd, Jack returned to the air over NBC's network, Sunday, 7:00 P.M. EST. It will be his fifteenth year on the air and his thirty-fifth in show business.

Fred Allen and his Alley returned Sunday, October 6th at 8:30 P.M.

SYLVANIA NEWS

NOVEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 9

In This Issue:

COMMENTS . .
By BOB ALMY

As everyone knows, radio sets, component parts and radio tubes are no longer subject to OPA price control. Radio tube prices at distributor, dealer and consumer levels were increased approximately 14% by the OPA effective October 28, which was just prior to the issuance of OPA decontrol order.

Now the responsibility for establishing and maintaining a proper price structure rests with the manufacturers and the industry. As discussed in previous issues of Sylvania News certain adjustments are indicated—some of which will probably be made over the next few months.

It is conceded and only logical that list prices should bear an approximately uniform relationship to manufacturing costs. Then, it follows that if dealers and distributor prices are based on list prices, the prices at all distribution levels would be consistent with the cost of manufacture. Production costs are to a large extent determined by the quantity produced, which, of course, depends on the sales demand. Naturally if a tube ean be produced at an efficient rate day in and day out, lower costs are obtained.

Today's prices for replacement types are based on pre-war price schedules. The current demand is such that many types, popular pre-war for replacement or original equipment, are not now required in large or efficient production quantities. By the same token other new types have come to the front. For example we are now producing large quantities of lock-in types for original equipment, which will become heavy volume replacement types later. Sales demand changes gradually but consistently.

Trade reaction to the October 28 tube price schedule increase has been mixed. Many retailers share the opinion that list prices on many tube types are too high compared to the original cost of radio sets using these types. Now that we have had a few weeks' experience, we will welcome comment from Sylvania News readers. The concensus of opinion to date seems to be that some list prices are too high and others too low, and that adjustments would be desirable.

TELEVISION DEVELOPMENTS

Brilliance of Color in Television Images Increased Eleven Times

By employing a new set of color filters and increasing the number of frames per second, Dr. Goldmark reports that the potential brilliance of color television pictures has been multiplied eleven times. The new filters permit an increase in illumination of two and one-half times—increasing the color frame rate from forty to forty-eight augments the intensity of illumination four and one-half times.

Dr. Goldmark of C.B.S. speaking before the Electronics Conference in Chicago, said that color fidelity of the system surpasses present photographic means of color reproduction.

U H F Proves To Be Transmission Medium For Video Broadcasts

Seven months of field tests by the Columbia Broadcasting Company have supported the fact that ultra-high frequencies provide a sound transmission medium for television broadcasts. The report indicated that 10 kilowatts provide satisfactory color television for a radius of 50 miles. Long distance tests (up to 191 miles) were conducted with a pulse transmitter on 700 megacycles, utilizing a highly directional antenna.

William Lodge, reporting on C.B.S.'s color television research, said that utilization of u h f for television broadcasting would permit ghost-free reception in 98 to 99% of homes having a signal of usable intensity. Furthermore, u h f bands are virtually free of man-made interference and completely free of natural static.

The u h f field tests employed a new type of broadcast coverage, in place of the original field intensity contour maps.

C.B.S. has petitioned the F.C.C. for authorization of commercial u h f channels when there is more space to permit further color television development.

Electronic Color Television

October 30th—a flickerless, all-electronic television system was demonstrated publicly for the first time by the Radio Corporation of America. The system is a complete departure from the mechanical method involving rotating disks and other moving parts.

By the use of a simple, inexpensive radio-frequency converter, present-day television sets will be able to receive color broadcasts as well as black and white.

In the demonstration, a light beam was focused through a color slide television camera. A system of mirrors and photo-electric cells separated the beam of light into its component colors. The signals (red, blue and green) were received by a Trinoscope (three kinescopes) which projects the compositely colored image.

Increased Screen Size For Video

Word comes from Switzerland—television pictures of any desired size are now a theoretical possibility, thanks to the work of Prof. Dr. F. Fischer of the Swiss Federal Institute of Technology. A larger screen system may be realized by controlling a strong beam of light by the modulated ray.

The new screen system is based on a point-to-point deformation of the surface of a stratum of liquid by means of electrostatic forces. The light passes through the liquid and is deflected by the deformed points on its surface—the resulting faces of light are made visible by projection. A charging of the liquid's surface by cathode rays is necessary for the deformation.

SYLVANIA NEWS

MERCHANDISING SECTION

NOVEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 9

CREDIT....AND ITS DISADVANTAGES

IS THE "GOOD WILL" WORTH THE RISK?

"Some sigh for the Glories of This World; and some
Sigh for the Prophet's Paradise to come;
Ah, take the Cash, and let the Credit go,
Nor heed the rumble of a distant Drum!" —OMAR KHAYYAM

The old bard wasn't so far wrong, penning his verse, lo, those many years ago. For the same is true today. Radio servicemen can eliminate their losses due to bad debts, the costs of collecting back bills and inroads on their working capital by conducting their business on a cash basis. The credit is better left alone.

Credit is a problem—a definite business risk—a headache to be avoided if business can possibly be conducted on a cash and carry basis.

More is said about the trials and tribulations of collecting bad debts than about the advantages of a credit system. And necessarily so.

For Risk Is Greater Than The "Good Will"

Theoretically, loss due to bad debts could be kept at a minimum. Actually, even with an efficient policy of collection, losses may eat up as much as 1% of your gross profits. And that may be as much as 20% of your net profit. Radio serviceman, beware!

Charge accounts are a convenience to shoppers, but not to you on whom falls the burden of meeting expenses.

In small doses, it will attract a "repeat trade." But charge accounts also make for "repeated," bills unpaid.

Credit reduces the price obstacle. But only for the moment. When the time comes to pay the bill, the obstacle is there again, big as life—even larger than it was before because the benefits of your repair job are not so tangible now. The customer probably has forgotten what it was like to have a set in the house that wouldn't work.

Credit is not needed to impart a sense of confidence to the customer for your work. That comes with good servicing. Only then will the neighborhood feel you're there to stay.

In some cases, a credit system may be necessary, because of a special marketing area, sales procedures or customers, or credit policies of competitive shops. If so, here are some things to consider:

Needed: A Fixed Policy

Most important element of a credit system from a business standpoint is a fixed policy, set to obtain maximum sales at a minimum loss. It is the tendency for ambitious, good-natured radio servicemen to extend credit beyond the realm of good judgment. But remember—a service job isn't sold until it's paid for. As with most things, moderation is the key to success . . . be credit-lenient and you'll lose money; too harsh and you'll foster needless ill-will.

The Risk

Of course, any risk will entail some loss. In this case, it will probably be about one half of one per cent but should be no more than one per cent of a radio serviceman's gross income. In addition, there will be the expenses of bookkeeping and collecting.

A credit department, whether that be you or your Credit and Collection Dept., should function in the prevention of bad credit, and in the collecting of debts if and when they do arise. Prevention will mean weighing the risk of each account before the credit is granted. Points to be considered:

(1) No open credit.

(2) Ability to pay. Such information may be obtained from the customer's references, other businesses in the neighborhood, or from the individual's bank.

(3) But even more important is Willingness to pay! There are well-to-do families who through carelessness or miserliness, fail to meet their obligations. From neighborhood stores or the individual's bank, it is wise to find out how a prospective credit account has met previous obligations.

(4) Other points to be considered: does he or she live in the neighborhood, how long have they lived there, do they own property there? Leniency must also be tempered according to the amount of capital you are able to extend in the form of credit; and the credit policies of neighboring stores.

For collection, promptness, regularity, and tact are cardinal virtues . . . promptness and regularity to appear determined and efficient; tact, that you may keep your debtor's business. Remember: while collecting bills, you're still selling.

Tardy Payments

Tardy payments accomplish the same poor results as slow stock turnover. It enforces a low return on your invested dollar because of the risk involved and the possible .5% to 1% loss from debts outstanding. Debts outstanding tie up a portion of your working capital. Don't forget—the longer a bill remains unpaid, the less apt you are to collect. The more punctually a bill is paid, the sooner that customer will be in a position to buy more servicing.

In order to collect your bills promptly, specific terms of payment are essential. It is wrong to assume customers will pay their bills at the end of each month unless instructed specifically to do so. Set a date for payment or the bills may be coming in at any time; or not at all.

(Continued on page M-36)

THE FOUR-WHEELED PILGRIM

For ambitious, businesslike business men, inefficiency is a distasteful thing. It was for efficiency's sake that Pilgrim Distributors Co. obtained a delivery truck to replace the parcel delivery service on which they had been depending.

Their parcel delivery service, because they serve a number of companies, could not deliver Pilgrim's dealer-orders for some time after they were picked up. "So," said Mr. Oliver of Pilgrim, "we made arrangements on a contract basis, for the exclusive use of a truck and driver to cover all points in Chicago and a nearby town, all in one day.

"In actual practice, the truck covers the north side of Chicago one day, the south side, the next. Orders given our salesmen by dealers in either section of the city can be delivered the next day with our new set up . . . nary a complaint have we had regarding a delayed order since we've had our own delivery truck."

Servicemen as well, can take a tip from this distributor and operate a radio service delivery truck. Minor service repair jobs can be handled in the truck giving your customers "on-the-spot" service. At the same time, the truck can be used for delivering shop-repaired sets and new merchandise.

RADIO SERVICING IN THE HOME

Servicing Calls Are Your Opportunity To Guarantee Future Business

Mrs. American Housewife knows little or nothing about radio servicing techniques. She, therefore, will probably judge your servicing by the appearance of you and your shop, and the way in which you conduct your work when servicing a set in her home. Personal salesmanship will, for a large part, determine the acceptance of your business by your neighborhood.

Mrs. Housewife's front room is the front line of radio servicing. There rests the success or failure of your business. Remember that, the next time you call on a customer. That call is the opportunity to guarantee service jobs for the future. Make the best of it!

You arrive at Mrs. Housewife's home to repair her radio: nursing the ailing set back into a receptive mood is half the job. The other half is personal salesmanship.

Present a neat, businesslike appearance, both in your dress and with your tools. Remember if you are selling service your customers look at the way their service is packaged. Attractive jackets or coats, the kind that give you a trim professional look and inspire customer confidence are professional touches that cost little, but pay big dividends. Your tool kit should also be attractive—keep it clean and neat inside and out. You're a professional man—look like one.

Offer your customer all the "plus services" that you are able. Ask the housewife for newspapers to

(Continued on page M-35)

SYLVANIA NEWS

TECHNICAL SECTION

A. V. BALDWIN, *Technical Editor*

NOVEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 9

ANNOUNCING SYLVANIA 3" OSCILLOSCOPE NEW SERVICE INSTRUMENT

One of the most useful instruments in any service shop is an oscilloscope, and of the several possible sizes probably the three inch is the most popular. Sizes smaller than the three inch are extremely convenient for portable work but the pattern obtainable is a little small for most purposes. The five inch and larger types are certainly best for laboratory and precision work, but are more expensive and bulky than many serviceman would like.

Figure 1 shows the Sylvania Type 131 oscilloscope designed for servicemen and now added to the fast growing line of Sylvania service instruments. Previously announced were the type 134 Polymeter (Sept. Sylvania News) and the type 139 and 140 Tube Testers (August News).

Figure 2 shows the complete schematic diagram. The heart of the instrument is of course the Sylvania type 3AP1 Cathode Ray tube. The saw tooth oscillator uses the well-known type 884. Two type 7C7's are used for the horizontal and vertical amplifiers, and the high voltage is supplied by a type 5Y3GT. Amplifier voltages are supplied by a type 7Y4.

The sweep circuit covers the range of 15 cycles to 40,000 cycles per second with 5 steps on the selector switch. Provision is also made for external synchronizing when desired. The amplifier response is uniform within 3 db. from 10 cycles to 100 kilocycles and has a sensitivity sufficient to cause a one inch total deflection with a maximum of 0.5 volts rms input. When the amplifiers are disconnected by turning the gain switches to the lowest position the deflection plates are connected directly to the input giving a sensitivity of approximately 19 volts rms per inch peak to peak.

Since the circuit cut was prepared a change has been found advisable in R17 in order to allow a factory adjustment of the low frequency sweep. Resistor R17 becomes a 400 ohm potentiometer with a 750 ohm fixed resistor between it and ground.

The instrument is equipped with a removable transparent scale and a hood is provided to reduce the effect of room lighting on the screen visibility.

All the controls, including those for beam centering are on the front panel and the interior layout is specially designed to permit ready access to any part for replacement if it should ever be necessary.

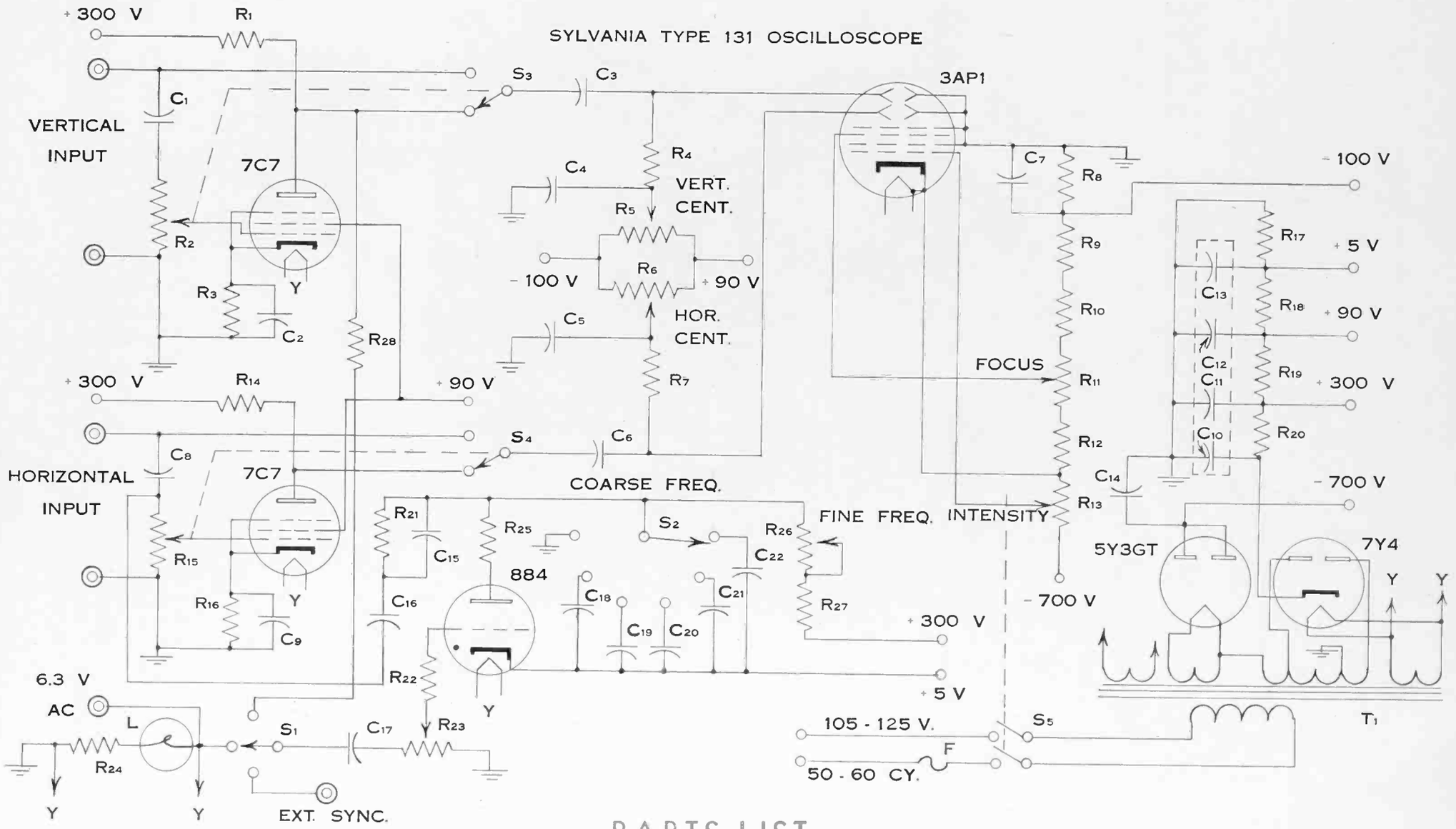
Specific operating instructions will not be repeated here as they are familiar to most servicemen and are given in the instruction book included with the instrument. Suggested hook-ups for use in checking or adjusting audio amplifiers, receiver alignment, filter circuits and hum analysis are also included in the instruction book.

Radio amaters and experimenters will also be interested in other uses such as modulation measure-

(*Continued on page T-36*)

FIGURE 1

COMPLETE SCHEMATIC CIRCUIT



PARTS LIST

SYMBOL	DESCRIPTION	RATING	% TOL.
C1	Condenser, Tubular Paper	0.25 μf., 600 V.	+30, −20
C2	Condenser, Tubular Paper	0.004 μf., 400 V.	+20, −10
C3	Condenser, Tubular Paper	0.1 μf., 400 V.	+30, −20
C4	Condenser, Tubular Paper	0.01 μf., 400 V.	+30, −20
C5	Same as C4		
C6	Same as C3		

SYMBOL	DESCRIPTION	RATING	% TOL.
C7	Same as C1		
C8	Same as C1		
C9	Same as C2		
C10	Condenser, Can Type Electrolytic	10 μfd., 450 V.	
C11	Condenser, Can Type Electrolytic	10 μfd., 450 V.	
C12	Condenser, Can Type Electrolytic	10 μfd., 450 V.	
C13	Condenser, Can Type Electrolytic	20 μfd., 25 V.	

PARTS LIST (Continued)

SYMBOL	DESCRIPTION	RATING	% TOL.
C14	Condenser, Can Type Paper	1.0 μf., 1000 V.	
C15	Condenser, Mica	10 μμf., 500 V.	±10
C16	Condenser, Tubular Paper	0.5 μf., 400 V.	+30, −20
C17	Same as C3		
C18	Condenser, Tubular Paper	0.25 μf., 400 V.	±20
C19	Condenser, Tubular Paper	0.04 μf., 400 V.	±20
C20	Condenser, Tubular Paper	0.008 μf., 400 V.	±20
C21	Condenser, Mica	1000 μμf., 500 V.	±10
C22	Condenser, Mica	220 μμf., 500 V.	±10
F	Fuse, Type 3AG	1 ampere	
L	Lamp—Incandescent Bayonet	6-8V., 0.15 A.	
R1	Resistor—Composition	82,000 ohms, ½ W.	±10
R2	Resistor—Variable, linear taper	1 meg., ⅓ W.	±20
R3	Resistor—Composition	820 ohms, ½ W.	±10
R4	Resistor—Composition	2.2 meg., ½ W.	±10
R5	Resistor—Variable, linear taper	3 meg., ⅓ W.	±20
R6	Same as R5		
R7	Same as R4		
R8	Resistor—Composition	0.15 meg., ½ W.	±10
R9	Resistor—Composition	0.1 meg., ½ W.	±10
R10	Same as R8		
R11	Resistor—Variable, linear taper	0.15 meg., ⅓ W.	±20
R12	Resistor—Composition	68,000 ohms, ½ W.	±10
R13	Resistor—Variable, linear taper	35,000 ohms, ⅓ W.	±20
R14	Same as R1		
R15	Same as R2		
R16	Same as R3: See article for change		
R17	Resistor—Composition	15,000 ohms, 1 W.	±10
R18	Resistor—Composition	33,000 ohms, 2W.	±10
R19	Resistor—Wire wound	3000 ohms, 10 W.	±5
R20	Same as R4		
R21	Resistor—Composition	27,000 ohms, ½ W.	±10
R22	Resistor—Variable, Audio taper	50,000 ohms, ½ W.	±20
R23	Resistor—Composition	33 ohms, ½ W.	±10
R24	Resistor—Composition	390 ohms, ½ W.	±10
R25	Resistor—Variable, linear taper	4 meg., ½ W.	±20
R26	Resistor—Composition	0.39 meg., ½ W.	±10
R27	Resistor—Composition	1.0 meg., ½ W.	±10
R28	Switch—Rotary, S.P. 3T Non-shorting		
S1	Switch—Rotary, S.P. 6T Non-shorting		
S2	Switch—Variable Resistor Mounting S.P. 2T		
S3	Switch—Variable Resistor Mounting S.P. 2T		
S4	Switch—Variable Resistor Mounting 2P. S.T.		
S5			

MORE DATA ON EUROPEAN TUBES

Requests for information on the proper Sylvania tubes to be used as substitutions for European types are still a fair percentage of our mail. The following list is in addition to those previously published in the December 1945 and the March-April 1946 issues. Reference is made to the base figures shown in the December issue. Those of you who were not on our mailing list at that time may obtain a copy of this issue on request.

TABLE I

Type	Base Figure	1	2	3	4	5	6	7	8	Notes
ABC1	4	H	S	P	NC	Dp	Dp	K	H	(2)
ABL1	4	H	NC	P	Gs	Dp	Dp	K+S	H	(2)
AB1	1	H	P	H	S					(9) K in center
ACH1	7 Pin	H	K+S	P	Go	Ga	Gs	H		(2)
AC6/Pen	7 Pin	H	K	Gs	S	P	Su	H		(2)
AF3	4	H	S	P	Gs	NC	Su	K	H	(2)
AF7	4	H	S	P	Gs	NC	Su	K	H	(2)
AK1	7 Pin	H	K+S	P	Ga	G1	Gs	H		(2)
AK2	4	H	S	P	Gs	Go	Ga	K	H	(2)
AL3	4	H	NC	P	Gs	G	NC	K	H	
AL4	4	H	NC	P	Gs	G	NC	K	H	
AM2	4	H	NC	P	T	G	tie to K	K	H	
AX1	1	F	P	F	P		tie			
AZ1	4	F	NC	P	NC	NC	P	NC	F	
B409	1	F	P	F	G					
B443/S	1	F	P	F	G					Gs in center
CBC1	4	H	S	P	NC	Dp	Dp	K	H	(2)
CB2	5 Pin	H	S	P	K+S	H				
CF7	4	H	S	P	Gs	NC	Su	K	H	(2)
CK1	4	H	S	P	Gs	Go	Ga	K	H	(2)
CL2	4	H	NC	P	Gs	NC	NC	K+Su	H	(2)
CL4	4	H	NC	P	Gs	NC	NC	K+Su	H	(2)
CY1	4	H	NC	P	NC	NC	NC	K	H	
DAC21	2	F	S	P	NC	NC	Dp	NC	F	(2)
DBC21	2	F	S	P	NC	Dp	Dp	NC	F	(2)
DF21	2	F	S	P	Gs	NC	Su	NC	F	(2)
DF22	2	F	S	P	Gs	NC	Su	NC	F	(2)
DK21	2	F	S	P	Go	Gs	NC	Ga	F	(2)
DLL21	2	Fc	Gt1	Pt1	Gs	Gt2	Pt2	F	F	
DL21	2	F	NC	P	Gs	G	NC	NC	F	
D1	Not Given									
EBF2	4	H	S	P	Gs	Dp	Dp	K	H	(2)
EBL1	4	H	NC	P	Gs	Dp	Dp	K+S	H	(2)
EBL21	2	H	P	G	Gs	Dp	Dp	K+Su	H	
ECH21	2	H	P	Ga	Go	Gs	G	InjG	H	(6)
EFM11	3	NC	RC	P	G	K	T	H	H	
EF8	4	H	S	P	G3	G2	G4	K	H	(2)
EL2	4	H	NC	P	Gs	NC	NC	K	H	(2)
EM1	4	H	NC	P	T	G	NC	K	H	
EZ2	4	H	NC	P	NC	NC	P	K	H	
E443H	1	F	P	F	G					Gs in center
E446	1	H	Gs	H	G					(9) K in center
E449	7 Pin	H	K+S	P	G4	G3	G2	H		(2)
HL41DD	2	H	K	P	NC	Dp	S	Dp	H	(2)
KTW61	2	S	H	P	Gs	Su	NC	H	K	(2)
Pen 45	2	H	K	P	Gs	G	S	NC	H	
SP41	2	H	K	P	Gs	Su	S	NC	H	(2)
SP42	2	H	K	P	Gs	Su	S	NC	H	(2)
T41	2	H	K	P	NC	G	S	NC	H	
UU4	1	H	P	H+K	P					
U21	1	H	NC	H+K	NC					(9)
U2020	4			F			F			
VP41	2	H	K	P	Gs	Su	S	NC	H	(2)
X65	2	NC	H	P	Gs	Go	Ga	H	K	(2)
Y61/Y63	2	NC	H	P	G	RC	T	H	K	
431U	1	H	P	H+K	P					
225DU	7 Pin	F1	F1	P1	NC	P2	F2	F2		

Notes:
(2) Cap connected to grid.
(6) Cathode connected to locking lug.
(9) Cap is connected to plate.

Abbreviations.
Dp—Diode Plate
G—Control Grid
H—Heater
K—Cathode
Su—Suppressor Grid
InjG—Injector Grid
F—Filament
Ga—Oscillator Anode
NC—No Connection
T—Target
S—Shell
Fc—Filament Center
Go—Oscillator Grid
Gs—Screen Grid
P—Plate
T1, 2—Triode 1 or Triode 2

Pin numbering system used in above table and in figures is arbitrarily taken similar to the RMA system used in this country. It is probably different from any European system which may appear on either the socket or the tubes.

This information has been compiled from various sources and while we believe it is correct, we can accept no responsibility for errors.

CORRECTION

A mistake slipped into the article on Selenium rectifiers last month. In the first paragraph the maximum operating voltage is stated as 76 volts per disc. The correct figure of course is 26 volts per disc since 5 times this gives 130 volts the rated maximum voltage for A. C. lines.

EUROPEAN TUBE DATA *Cont'd.*

Required Type	Filament Volts	Filament Current	Suggested Replacement	Rewire Socket D	Change Socket E	Realign F	Add Top Cap Connection G	Remove Cap Connection H	Change Bias or Plate Volts K	Notes (1)
ABC1	4.0	0.65	7B6	D	..	..	G	..	..	(2)
			7C6	D	..	..	G	..	..	(2)
			7E6	D	..	..	G	..	..	(2)
ABL1	4.0	2.25	7C5 + duodiode or change complement to make a duodiode available from another substitution.							(2)
AB1	4.0	0.65	7A6	..	E	..	..	H	..	(2)
			6H6GT	..	E	..	..	H	..	(2)
ACH1	4.0	1.0	6J8G	..	E	F	..	..	..	(2)
			7J7	D	..	F	..	H	..	(2)
			7S7	D	..	F	..	H	..	(2)
AC6/Pen	4.0	1.75	42	..	E	..	..	H	..	(2)
			2A5	..	E	..	..	H	..	(11)
			7C5	..	E	..	..	H	..	(2)
AF3	4.0	0.65	7A7	D	..	F	G	..	..	(2)
			7B7	D	..	F	G	..	..	(2)
AF7	4.0	0.65	7C7	D	..	F	G	..	..	(2)
			6J7G	..	E	F	..	..	..	(2)
AK1	4.0	0.65	2A7	..	E	F	..	..	..	(11)
			6A7	..	E	F	..	..	..	(2)
			7A8	..	E	F	G	..	..	(2)
AK2	4.0	0.65	7J7	D	..	F	G	..	..	(2)
			6J8G	..	E	F	..	..	..	(2)
			7A8	D	..	F	G	..	..	(2)
			2A7	..	E	F	..	..	..	(11)
AL3	4.0	1.85	42	..	E	..	..	..	..	(2)
			6F6	..	E	..	..	..	..	(2)
			7B5	D	..	..	..	..	..	(2)
			2A5	..	E	..	..	..	..	(11)
AL4	4.0	1.75	7C5	..	E	..	..	..	..	(2)
			6V6GT	..	E	..	..	..	..	(2)
4AM2	4.0	0.32	2E5	..	F	..	..	..	..	(11)
			6E5	..	E	..	..	..	..	(2)
			6U5	..	E	..	..	..	..	(2)
AX1	4.0	2.0	80	..	E	..	..	..	..	(2)
			5Y3G	..	E	..	..	..	..	(2)
AZ1	4.0	1.1	80	..	E	..	..	..	..	(2)
			5Y3G	..	E	..	..	..	..	(2)
B409	4.0	0.15	49	..	E	..	..	..	..	(11)
			112A	..	E	..	..	..	..	(2)
B443/S	4.0	0.15	1J5G	..	E	..	..	..	..	...
			1G5G	..	E	..	..	..	..	...
CBC1	13.0	0.20	14E6	D	..	..	..	H	..	...
			6R7GT	..	E	..	..	..	..	...
			6SR7	..	E	..	..	H	..	...
CB2	13.0	0.20	7A6	..	E	..	..	..	..	...
			6H6	..	E	..	..	..	..	...
CF7	13.0	0.20	14C7	..	E	F	..	H	..	...
			12J7GT	..	E	F	..	..	..	..
CK1	13.0	0.20	14B8	D	..	F	..	H	..	...
			12A8GT	..	E	F	..	..	..	...
			14J7	D	..	F	..	H	..	...
CL2	24.0	0.20	35A5	..	E	..	G	..	..	...
			35L6GT	..	E	..	G	..	..	...
CL4	30.0	0.20	35A5	..	E	..	..	H	K	...
			35L6GT	..	E	..	..	H	K	...
CY1	20.0	0.20	35Z3	..	E	..	..	..	..	...
			35Z5GT	..	E	..	..	..	..	...
DAC21	1.4	0.025	1LH4	D	..	..	..	H	..	...
DBC21	1.4	0.05	1N5G	..	E	Use as triode for Transformer coupling				
			1LN5	D		Use as pentode for Resistance coupling				
DF21	1.4	0.025	1LN5	D	..	F	..	H	..	...
			1LC5	D	..	F	..	H	..	...
DF22	1.4	0.05	1N5GT	..	E	F	..	..	..	...
			1LN5	D	..	F	..	H	..	...
DK21	1.4	0.05	1LA6	D	..	F	..	H	..	(4)
			1A7GT	..	E	F	..	..	..	(4)
DLL21	1.4	0.10	None	..	..	..	..	..	..	...
			Use two tvpes 1C5G or 1A5G Change circuit to use one output pentode.							
DL21	1.4	0.05	1LA4	D	..	..	..	..	..	...
D1	4.0	0.20	2W3GT	..	E	..	..	..	..	(11)
			2V3G	..	E	..	..	..	..	(11)
			2X2	..	E	..	..	..	..	(11)
			2Z2	..	E	..	..	..	..	(11)
EBF2	6.3	0.20	7R7	..	E	..	..	H	Parallel Heaters	
			14R7	..	E	..	..	H	Series Heaters	
EBL1	6.3	1.50	7C5 + duodiode or change complement to make a duodiode available from another substitution.							
EBL21	6.3	0.90	Same as EBL1	..	..	..	..	..	..	...
ECH21	6.3	0.33	7S7	D	..	F	..	..	..	(8)
			7J7	D	..	F	..	..	..	...
EFM11	6.3	0.20	6N5	..	E	..	..	..	..	(10)
EF8	6.3	0.20	None	..	..	..	..	..	..	...
			Recommend change in circuit to use 7A8, 6A8G, etc.							
EL2	6.3	0.20	7B5	..	E	..	..	H	..	...
			6K6	..	E	..	..	H	..	...
			6F6	..	E	..	..	H	..	...
EM1	6.3	0.20	6N5	..	E	..	..	..	..	...
EZ2	6.3	0.40	7Y4	..	E	..	..	..	..	...
			6X5GT	..	E	..	..	..	..	...
E443H	4.0	1.1	47	..	E	..	..	..	..	(11)
			42	..	E	..	..	..	..	(2)
			2A5	..	E	..	..	..	..	(11)
E446	4.0	1.1	57	..	E	F	..	..	..	(11)
			(Note: Cap is plate connection)							
			77	..	E	F	..	..	..	(2)
E449	4.0	1.2	None	..	..	..	..	..	..	...
			Recommend change in circuit to use 7B7 or 7A7							(2)
HL41DD	4.0	0.65	7E6	D	..	F	..	H	..	(2)
			6R7G	D	..	F	..	..	..	(2)
KTW61	6.3	0.30	6SK7GT	D	..	F	..	H	..	..
			6K7GT	D	..	F	..	..	..	...
			7A7	..	F	F	..	H	..	...
Pen 45	4.0	1.75	46	..	E	..	..	..	..	(11)
			47	..	E	..	..	..	..	(11)
			6V6	..	E	..	..	..	..	(2)
			7C5	D	..	..	..	..	..	(2)
SP41	4.0	0.65	7V7	D	..	F	..	H	..	(2)
			7W7	D	..	F	..	H	..	(2)
SP42	4.0	0.95	7V7	D	..	F	..	H	..	(2)
			7W7	D	..	F	..	H	..	(2)
T41	4.0	1.5	884	..	E	F	..	..	..	(2)
			885	..	E	F	..	..		(11)
UU4	4.0	2.2	80	..	E	..	..	..	..	(2)
			5Y3G	..	E	..	..	..	..	(2)
U21	2.0	1.65	2X2	..	E	..	..	..	..	...
U2020	110-125	0.200	Ballast Tube; See December 1945 Sylvania News.							
VP41	4.0	0.65	7H7	D	..	F	..	..	.	(2)
			7AH7	D	..	F	..	..	..	(2)
X65	6.3	0.30	6J8G	D	..	F	..	..	..	..
			7J7	..	E	F	..	H	..	...
Y61/Y63	6.3	0.30	6E5	D	..	..	..	..	..	(10)
			6G5	D	..	..	..	..	..	..
43IU	4.0	2.5	80	..	E	..	..	..	..	(2)
			5Y3G	..	E	..	..	..	..	(2)
225DU	4.0	0.5	Two 2W3	..	E	..	..	..	..	(11)

Notes

(2) The filament of the suggested type may not be hot enough to work properly unless the primary taps permit adjustment to the correct voltage.

(4) Filament type triode-hexode converters are not made here. The suggested converters should work with the same coils.

(8) The European tube has the injector grid of the hexode brought out separately. Connect this to the oscillator grid when replacing with the recommended substitute.

(10) Change circuit to standard American practice. Ray control is internally connected in our tubes.

INTERCHANGEABLE TYPES

RE134	Same as B409
RES164	Same as B443S
RES964	Same as E443H
RENS1234	Same as E449
M/S Pen	Same as E446
4H2	Same as AF3
4V1	Same as ABC1
4E1	Same as AL4
14ONG	Same as AZ1

SYLVANIA TYPE 131 OSCILLOSCOPE

(*Continued from page T-33*)

ments, wave form analysis and frequency determination. Many other uses may also be found and as these applications become important to servicemen we will try to have detailed articles on the subject in the "News." Suggestions from servicemen on particular problems would be welcomed and if it seems that enough readers are interested we hope we can arrange for an article on the subject.

The type 131 oscilloscope is the latest addition to Sylvania's expanding line of test equipment. It is now available at your Sylvania distributor's.

A few references are listed below for those who wish to go into a more detailed study of certain problems: Guide to Cathode-Ray Patterns—Merwyn Bly; Measurements in Radio Engineering—F. E. Terman; Photographing Patterns on Cathode Ray Tubes—Electronics, Feb. '44; Industrial Applications of the Oscilloscope—Radio News, Nov. 1943; The Cathode Ray Tube at Work—John Rider.

RADIO SERVICING IN THE HOME

(*Continued from page M-34*)

put under your work . . . she'll appreciate your thoughtfulness. Fix scratches and broken knobs and give the doctored set a thorough cleaning. Wind the aerial around a Sylvania antenna spool while you're servicing the set—to get it out of the way, and leave it there as a reminder to call you when it comes time for more servicing work.

Before you leave, take time out to explain the parts replaced, the servicing needed. Inform your customers you have replaced old tubes with **Sylvania** tubes . . . quality manufactured to allow the best possible reception. People appreciate itemized service charges. At the same time, they feel as though they were being let in on professional secrets. Convince your customer that a complete change of tubes is

necessary for the best reception. Ask your customer if she has any

(*Continued on page M-36*)

SHOP O' THE MONTH

McLaughlin Quality

At one time, Pete McLaughlin, 1115 Chanslor Ave., Richmond, Calif. was interested in radio only as a hobby. Pete was a layout man in private industry—he tinkered with radios at night.

When war-service disabilities compelled him to retire from industry, he entered the radio servicing game, with his hobby, and a vocational course in wireless to go on. Now he has one of the finest test benches in northern California.

His twelve-foot service bench is covered with light-green marbelized linoleum. The soft-green is easy on the eyes, particularly when working with small radio parts. The fluorescent fixtures are directed at the panel --the light is reflected indirectly to the bench eliminating all shadows. The panel is designed to hold a library of service manuals, and can be expanded to hold a growing library.

"Quality tests made after a set has been serviced, scratched cabinets repaired and polished is as important to us as the actual repair work," Pete said. "We concentrate on quality. And rightly so. For it's the extra services that help put a radio service shop on the map."

"Let us not concern ourselves about how other men do their duty, but concern ourselves about how we shall do ours."

—LYMAN ABBOTT

The secret to success: ". . . the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not."

—HUXLEY

"RADIO OUTLETS"

For Better Home Reception

Where advertising, and money in the pocket is concerned, a job half done is worse than no job at all.

Where radio servicemen are concerned, this means that "just servicing" a set is only half a service job.

In delivering a serviced set to its owner, it will make for better radio reception—and more service jobs—if you'll help your customer consider better reception, locations and future radio improvements for his home.

For a radio with a built-in aerial, there is no need for a ground connection . . . only for a power outlet. This is generally true of small table models.

For most sets, fair reception may be obtained by merely throwing the antenna out on the floor near the set. But your repair job will appear at its best advantage if perfect reception is achieved with an aerial leading to the outdoors and a ground connection.

Such an arrangement is made possible by a "radio outlet," generally composed of two power outlets, and outlets for both the ground and the aerial. (Care should be exercised in locating outlets where a radio is most apt to be placed.) These four outlets are combined in an ordinary electrical wiring box.

In its "Communications" circular, the University of Illinois proffers two suggestions regarding antenna lead-ins. (1) An outside antenna should have a lightening arrester where the antenna enters the house. (2) A non-metallic raceway for the antenna should be installed, if possible, to provide for radio and television advances.

Such considerations make for better reception—and better servicing.

ON THE COVER

Deft, steady feminine hands hold a lock-in tube mount in place while fangs of the electric spot welder join element leads to tube base pins. This is one of the many exacting operations that contributes to the sturdy, rugged Sylvania lock-in tube construction.

FOR BIGGER, BETTER BUSINESS....

THREE NEW SALES PROMOTION POST CARDS

For Bigger, Better, Business, here's Sylvania's three new post cards proclaiming, "We'll Do Your Radio Housecleaning Job . . . Remember This Telephone Number . . . Call Us If You Want Fresh Tone-Beauty From Your Radio."

People forget where they had their radios repaired. New families move into your neighborhood. Here's two of many reasons why you **mustn't** stop advertising. Sylvania's post cards sent to the "radio homes" in your neighborhood can keep a never-ending march of profit-dollars across your counter. These three silent salesmen printed in bright colors on government stamped postal cards, have a profit-word to say in your behalf. Give them a chance! Order the cards from your Sylvania distributor, The price is $1.00 per hundred, complete with your imprint. You pay only the cost of postage.

RADIO SERVICING IN THE HOME

(Continued from page M-35)

other electrical appliances on the blink. Offer specific examples: how's the electric iron working; is its cord in good shape? How's the toaster, roaster, lamp cords, etc.? Offer to fix them for her. Perhaps you can arrange with the electrical appliance stores in your neighborhood to mention their name where new appliances are needed. For each appliance sold in this way, a commission for you.

Paste the following list in the top of your service kit. They're important rules for good home servicing. Thereby hangs a sale!

REMEMBER:

1. Be neat, businesslike, friendly.
2. Ask for newspaper to put under your work.
3. Wind aerial around antenna spool.
4. Fix scratches and broken knobs.
5. Give the set a thorough cleaning.
6. Explain parts replaced, repairs made.
7. Inquire if other appliances need repairing.
8. Clean up the mess you've made.

"Two men look out through the same bars: one sees the mud, and one the stars." —LANGBRIDGE, "A Cluster of Quiet Thoughts"

CREDIT....

(Continued from page M-33)

If bills are not paid on time, begin your follow-up technique. In such cases, being firm is not bad business. For honest people will pay their bills with no resentment.

If two or three statements do not bring results, three letters at two week intervals should follow. Then a telephone call. Finally a personal call. If the bill still remains unpaid, turn the matter over to a collecting agency.

All the letters should be courteous. The second letter should carry a firm note—the third, a threat of litigation. And in all such matters: courtesy, promptness, regularity for the best results.

Payments by Check

When a check is submitted to you, and returned marked "insufficient funds," don't return the check to the signee. Losing this evidence of acknowledgement of the obligation, may delay payment indefinitely. Leave the check at the bank from whence it came. When funds are deposited to cover the check, the bank will certify it and return it to you.

A check given to you in part payment of a bill, need not be accepted unless there is tangible assurance that the bill will be paid in full some time in the future. A letter stating that the check enclosed (amount specified) is in part payment of the bill (date and amount), and that completion of payment will be carried out, is usually sufficient.

A check in part payment, marked "in full payment" carelessly accepted by you, releases the debtor from any further obligation.

Direct this article to the attention of your bookkeeper or to whomever you have delegated the job of credits and collections.

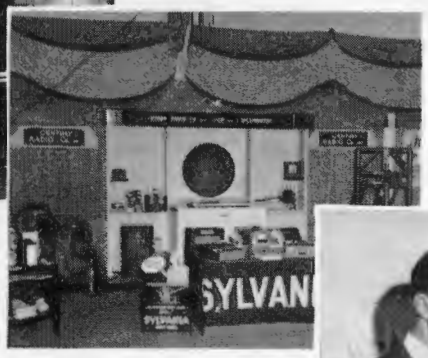
"The real sources of joy in this life are not the results of easy tasks, but of hard ones."

—SIR WILFRED GRENFEL

SYLVANIA PRODUCTS DISPLAYED IN THREE SHOWS IN CHICAGO AND THE EAST

Left: Wabash-Sylvania's display of electroflash units, superflash and superflood bulbs in New York's Museum of Science and Industry. Below: The radio tube and lamp exhibit.

Below: Sylvania's test equipment at the New Jersey State Fair, amid post-hole diggers, electrical milkers and such.



Below: Henry Johnson and George Conner, Advertising Manager and General Sales Manager for Electronics, respectively, put heads together for a confab at the Electronics Conference in Chicago.

During the autumn months, Sylvania exhibits were "in season." Sylvania's products were displayed at The Museum of Science and Industry in New York City, the New Jersey State Fair in Trenton and at the National Electronics Conference in Chicago.

In New York's Radio City, in addition to the regular Sylvania exhibit, was Wabash-Sylvania's collection of electroflash units, superflash and superflood products.

In Trenton, the Century Radio Company presented Sylvania's new polymeter, the counter and the portable tube testers for the first time in that area. The exhibit was held in Trenton's Commercial Exhibit Building.

The Edgewater Beach Hotel was the scene for The National Electronics Conference, October 3-5.

"RADIO PAGE"

Another use for the tiny T-3 proximity fuse tube as developed by Sylvania during the war has been reported. The tube's diameter

approximates that of a pencil and is only an inch and a half long.

A "radio - paging" service for doctors and businessmen has been authorized on an experimental basis by the F.C.C.

The receiver is about one and one-half times the size of a package of cigarettes, audible when held against the ear. Each receiver would have a code number. When it was broadcast, one need only call in to receive the message.

SYLVANIA ELECTRONIC PRODUCTS TO BE DISTRIBUTED IN CANADA

George Conner, General Sales Manager of Sylvania's Electronics Division, has announced that Stromberg-Carlson Ltd. of Canada will serve as Canadian distributor for Sylvania's industrial electronics tubes, laboratory equipment, and industrial and electronic devices for communication applications.

"This new distribution medium," said Mr. Conner, "will give Sylvania the opportunity to extend to Canadian industry, its electronic products as well as its research and development facilities."

TWO OUT OF FIVE WANT FM

The American Magazine reports that of the families planning to buy radio sets in the coming year, (American Magazine subscribers), two out of every five are looking forward to FM. These figures are limited to the 2,500,000 families who subscribe to the magazine.

According to a survey of a cross section of the American radio consumer public made by Sylvania's Sales Research Department, two out of every three persons planning the purchase of a radio, want FM.

41% of the families planning to buy radios, American Magazine said, considered FM a necessity. 63% of the prospective buyers would like combination radio-phonograph sets. Of the 2,500,000 families, only 18% owned combination sets. Those that planned to buy a console model were prepared to pay about $200 for it. 67% said they would

(*Continued on page G-36*)

PAUL ELLISON RETIRES AS CHAIRMAN OF BOARD OF ANA

Stresses Advertising As Public Information Medium

Mr. Paul Ellison, Director of Public Relations of Sylvania, is retiring as Chairman of the Board of the Association of National Advertisers.

Mr. Ellison, speaking before the Association's 37th anniversary convention at the Hotel Traymore, placed emphasis upon the increasingly important role of advertising as a medium for public information. It has a great effect on the day-to-day living habits of the ordinary citizen, Mr. Ellison averred.

"It is going to take all of our creative ingenuity to demonstrate before the world that competitive enterprise is not an archaic and decadent form of society"—he said, "that competition among individuals does work to elevate the lot of mankind."

DID YOU KNOW . . .

. . . that electronic manufacturers produce each year more than 100,000,000 electron tubes?

. . . that more electricity is used between the hours of 6 and 8 p.m. than is used in the other 22 hours of an average day?

. . . that in the United States 900 radio broadcasting stations daily serve more than 50,000,000 receiving sets? Sylvania's Sales Research Department reports that 83.3% of the 36,000,000 families in the U. S., have home radios, and that 41.5% have more than one set in their home.

. . . that there is a British-made radio set that has no dial? The set is built inside a plastic globe. The listener selects his program by plugging a line into points on a wall map. What next? Perhaps a set with the map of the universe for a dial . . . plug in the moon or mars . . . and the thing'll play "Stardust!"

. . . that television billboards may be a spectacle of the future?

FACTS AND FIGURES . .

Copper Production

The Bureau of Mines reports 55,699 short tons of copper produced in the month of August. This figure is slightly greater than the figure for July.

FM Output For 1946

Dr. W. R. G. Baker of General Electric speaking before the National Association of Broadcasters, stated that by the end of 1946, only 350,000 FM sets will have been produced. However, by the end of 1947, about 30% of all sets turned out would be equipped to receive FM. Dr. Baker reported that FM set production for the VJ-Day—September '46 period totaled 79,000 FM sets.

Charles Denny, acting chairman of the F.C.C., said there would be no further changes in frequency modulation wave lengths—that set manufacturers could now go ahead with confidence.

TWO OUT OF FIVE WANT FM

(*Continued from page G-35*)

buy television sets if they were marketed at a price they could afford.

According to the figures, there is an increasing demand for bedroom models. These are sets that will automatically turn on at the same time every morning, or that are built into bedside tables. A similar desire was expressed for kitchen models and sets in combination with other items of furniture. These figures coincide with Sylvania's plan for The Happy Radio Home—a radio in every room!

Sylvania, in its Home Radio Survey, reported that of the 20,150,000 families that planned to buy a radio set in the post-war period, 44.8% wanted radio-phonograph combination sets. 63.5% planned to purchase console models. And nearly 50% want television and will pay as much as $300 extra for it.

"I prefer the most unjust peace to the justest war that was ever waged."

—CICERO, "Letters to Atticus"

SYLVANIA NEWS
Published By
SYLVANIA ELECTRIC PRODUCTS INC.
Manufacturers of Sylvania Radio Tubes and Electronic Devices, Sylvania Incandescent Lamp Bulbs, Fluorescent Lamps and Equipment.
Vol. 13, No. 9 NOVEMBER, 1946
RETURN POSTAGE GUARANTEED

For:
Mr. Granville W. Arnold
139 Main St.
Emmaus, Pa.

POSTMASTER: If Addressee has moved, notify sender on Form 3547, postage for which is guaranteed. When Form 3547 is sent abandon this mailing. Return only if no correct address is available.

Sec. 562, P. L. & R.
U. S. POSTAGE
PAID
Emporium, Pa.
Permit No. 1

Emporium, Pennsylvania
P. O. Box 431

SYLVANIA NEWS

DECEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 10

Our Hopes and Fears for Future Years Are Met in These Tonight

COMMENTS BY BOB ALMY

Many more tubes have been delivered this year for domestic replacement use than was originally thought possible. The tube manufacturers have done a good job in alleviating the shortage condition which faced us at the beginning of the year. On the basis of incomplete figures, it is estimated that over 60,000,000 tubes will be delivered in 1946 for renewal use. This compares with 34,000,000 sold in 1941 and with 40,500,000 in 1945.

Total sales of receiving tubes by the manufacturers this year will approximate 200,000,000 which compares with 135,800,000 in 1941, the last normal year. These figures show that approximately 25% of total 1941 sales were absorbed for replacement, whereas in 1946 over 30% of total sales went into replacement channels.

We know that the figure of 60,000,000 replacement tubes sold by the manufacturers does not mean that this quantity was actually absorbed in the repair and maintenance of radio sets and electronic equipment. During the year distributor and dealer inventories have been accumulated of those types which have been available in free supply. In addition modest stocks are now held on a number of the high demand types which are still being allocated.

We are currently allocating to Sylvania Distributors approximately thirty types for which the supply is not adequate to meet the demand. This list changes each month. Types are dropped from allocation and placed on an available list as production catches up with demand. The list of allocated types is gradually decreasing. As we produce types for which a backlog of demand exists, these go through the cycle of allocation as long as necessary, then are listed as available. Because demand by type varies among the different sections of the country, we have made a practice of allocating larger quantities where needed. For example, more battery types have been offered to Sylvania Distributors who serve rural areas. Without question, our system of allocation has made for better and equitable distribution and this policy will be continued indefinitely.

Second Christmas

This December will be our second peacetime Christmas. For children, it'll be their second Christmas tree; their second Santa Claus. For the rest of us, it will be our second peacetime holiday.

There isn't much difference between the tiny tots gaping, wide-eyed, at Santa's presents, and you and I looking into our future.

For children, Christmas morning is the most wonderful moment of their lives. Time stands still in the glitter of the twinkling tree—the excitement of the presents. All the children can do is stand there, awed, not knowing where all the presents come from—or thinking about it.

You and I are like that. We're just like children. We're stunned by the newness and immensity of the responsibilities of peace this Christmas has brought. We're too surprised to move—even to think about what it all means.

Then comes the delight. Peace is here. "No more worries. No more responsibilities," we say. We haven't stopped to wonder where the blessing came from, or where it is taking us.

We have a whole new life ahead of us. An awesome future full of responsibilities. We've been like children not taking stock of them; forgetting, now that the newness of peace is wearing off, how important planning and a desire to be kind and gracious to other people, is to the years ahead.

Maybe Christmas is the best time to think about the future. For Christmas is a time for being happy, for planning, and for sensible optimism.

Our second Christmas is upon us . . . that wonderful feeling that comes with every December 25th. People are nicer to one another. They are kinder and more sentimental. People remember to enjoy being together. If people don't think of each other from here on in, there won't be another Christmas.

Cities are full of Christmas color. The tall buildings with their winking lights are like stately Christmas trees. And the dusk is red and green-tinted against the white falling snow.

And Christmas laughter drifts up from the street below.

Yes, this holiday is good for people. The coming year, if anything is to be made of it at all, will be built about a Christmas spirit—Thinking Of Other People!

For the radio serviceman, there'll be problems—in '47, in '48 and the year after that. That's not the bad part. There wouldn't be a challenge to business if there weren't problems. Reconversion wasn't meant to be accomplished in a day. There'll be problems. But they'll be serious only so long as each individual guy doesn't kick in to make peace everything we dreamed it could be.

Christmas is a good feeling because we stop to look ahead; and realize how much can be made out of the future—if we will!

Don't lose that feeling. We'll be needing it—for better business—and another Christmas.

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SYLVANIA NEWS

MERCHANDISING SECTION

DECEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 10

WHAT IS SALESMANSHIP?

COURTESY, A PART OF "SELLING LOGIC"

An important element of selling is the personality of the salesman. Personality is as important a part of selling logic as price, brand name, etc.

Personal salesmanship is important to radio servicemen . . . it's a part of good service. Without it, the best of servicing won't keep you in business. Being nice to people is the only way to attract their "repeat" business.

Caldwell-Clements Publishing Co. in their "1946 Profit Manual," list as the seven elements of a selling personality:

1. Character — good judgment and stability. It makes people believe in your other qualities.

2. Technical knowledge—knowing what the customers need in the way of servicing and what you can do for them.

3. Manner—self-confidence, good taste, being courteous.

4. Speech—knowing how to talk, what to talk about and when to stop talking.

5. Being neat and tidy.

6. The human touch—treating others as you would have them treat you.

7. Enthusiasm.

The following are suggested as qualities to consider in the developing of a pleasing personality:

Practising the Golden Rule
Making your efforts helpful to others
Doing something for somebody else
Being courteous
Talking distinctly; avoid mumbling
Being neat in dress, but not conspicuous
Talking about the other fellow's interest
Paying attention when someone else is talking
Not interrupting
Making your conversations informative and honest
Speaking well of others, always
Being dignified without being high hat
Learning to take a rebuff with a smile
Respecting the other fellow's viewpoint—and showing it.
Being persuasive without being combative
Delivering all that you promise
Serving others, despite the inconvenience
Keeping your temper and resentment to yourself

WATCH YOUR CREDIT RISKS

COLLECTIONS ON CHARGE ACCOUNTS HAVE DROPPED 4%

A closer watch on credit risks and limits has been urged for the future "because of the unsettled outlook for individual incomes." The opinion was expressed as a result of a survey conducted by the credit management division of The National Retail Dry Goods Association.

87% of the credit managers interviewed said they believed it would be well to watch credit risk and limits closely. Listed are the reasons for this attitude: less take-home pay, fewer assured incomes, less government pay, layoffs due to strikes, the increased cost of living, and the decreased purchasing power of the dollar.

It was reported, collections on charge accounts have decreased in 44% of the stores—the average drop was 4%. Similarly, "skips" were reported on the increase.

This survey supports the stand taken in the November issue of The Sylvania News, analyzing the disadvantages of a credit system. People are spending their savings rapidly, paying exorbitantly high prices for post-war luxuries. Cash reserves are being destroyed by strikes. The time may soon come when there will be no savings accounts to take care of those end-of-the month bills.

"I would rather be the first man here than the second in Rome."
—JULIUS CAESAR

"I heard the bells on Christmas Day
Their old familiar carols play,
And wild and sweet
The words repeat
Of peace on earth
Good will to men." —LONGFELLOW

— SHOP O' THE MONTH —

6 BROOKLYN AVENUE, FREEPORT, L. I.

Then *and* *Now*

Irving Tressler of 6 Brooklyn Avenue, Freeport, Long Island is a dealer in radios and electrical appliances as well as a serviceman. But, he, like so many in the field, realizing the importance of radio servicing to a community, gives as much time to servicing as he is able. One department complements the other.

Mr. Tessler keeps his service bench where customers can see it. They like to see what is happening to their sets. It gives them confidence in the job you're doing. When a set disappears into a dark, back room, they're apt to feel some bad tubes are being put into the set or a wire or two pulled loose.

Mr. Tessler keeps a neon light over his service department so that passers-by will know that here they can have sets repaired.

Mr. Tessler first set up shop in 1931. In 1944, he built a brand new place, complete with display room. The color scheme is soft and tastefully selected to accentuate the sets on display.

"I got my start back in 1931," Mr. Tessler said. "We handled Sylvania tubes then. We do to this day, for their quality is an essential part of our service."

SYLVANIA SHOWS ITS TELEVISION-LIVING ROOM TO THE PUBLIC

Sylvania introduced its "television-living room" to the public the last week in November with a cocktail party and a general get-together at 500 5th Avenue, New York City, The room, designed to permit one group of people to enjoy a television show while another reads or plays cards, is one in a series of rooms dramatizing the latest in flexible lighting developments.

Sylvania engineers designed a television set, the screen of which may be rotated in any direction. The television set (see picture) is built around the ten inch cathode ray receiving tube manufactured by Sylvania.

In the Auditorium Room is an impressive display of radio and electronic tubes.

SYLVANIA NEWS

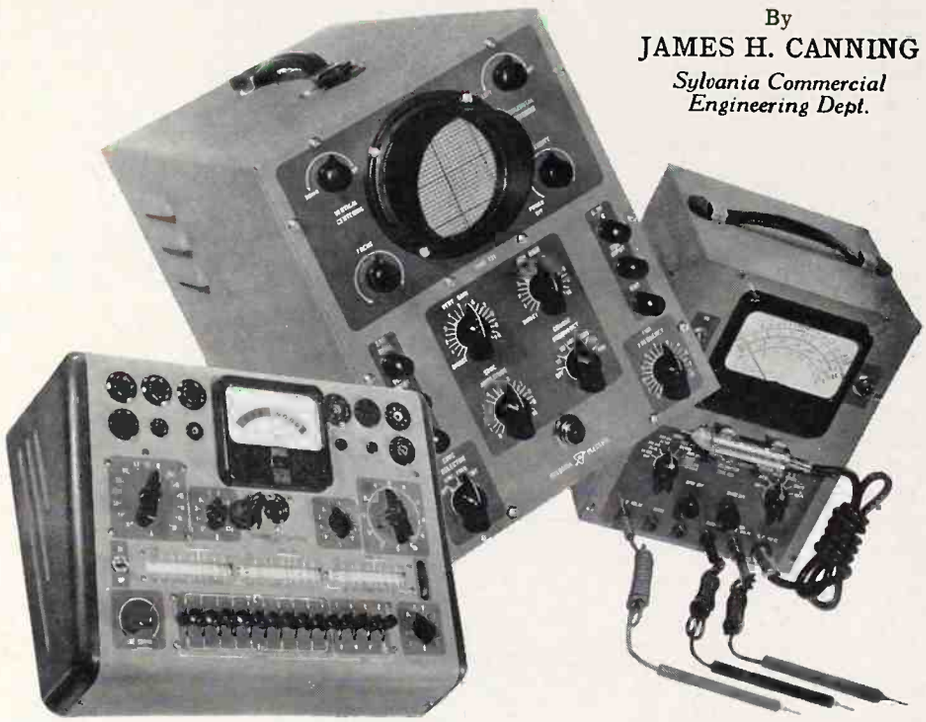
TECHNICAL SECTION

A. V. BALDWIN, *Technical Editor*

DECEMBER, 1946 EMPORIUM, PENNA. VOL. 13, NO. 10

GOOD SERVICEMEN NEED GOOD TEST EQUIPMENT

By
JAMES H. CANNING
Sylvania Commercial Engineering Dept.



Many of us can remember back to the days when radios were a sideline produced by novelty or switchboard apparatus manufacturers, and the incandescent lamp makers were just beginning to turn out a few radio tubes.

In those days radio servicing was a sideline too—often attempted, and usually successfully, by bright high school boys who had a Wm. B. Duck catalog and a copy of the Radio Edition of the "How to Make It" series!

In those days of TRF and regenerative detectors circuit constants were not critical, and as long as the batteries were up and the UV-201-A not burned out, you didn't have much trouble finding the defective part

Then cathode-type tubes, superhets, AVC, and high gain multi-element tubes began to appear and each brought performance up tremendously, but at the same time increased the pressure on the serviceman. Many dropped by the wayside, and the ones that stayed on were the progressives—the ones who didn't quit because their battery testing voltmeter wouldn't read AVC voltages! They learned about what was involved in a circuit, then obtained an instrument which would read properly in that circuit. This wasn't particularly easy, as there was little market for ammeters reading less than 5 amps, or voltmeters with high internal resistance. Manufacturers of instruments had not yet come to appreciate the possibilities of the service instrument field, and very few specifically designed instruments were available. Thousand ohm-per-volt voltmeters were sufficient for a long time, but it was found that such a meter couldn't furnish an accurate picture of what was happening in many cases, so the VT voltmeter and the cathode ray oscilloscope emerged from the laboratory, and began to appear on the serviceman's work bench.

The progressive serviceman's work bench, that is! It is true that many servicemen never took to every "new fangled contraption" that came out, and continued to do their service work with little more than a screw-driver and a voltmeter. True, many a radio can still be repaired with such simple equipment, particularly when in the hands of an experienced person—but what is his percentage of "cures," compared to that achieved by the well-equipped serviceman who really knows what is going on in each set? Without adequate instruments there must be a certain amount of guesswork, and therefore the number of cases completely cured is limited, due to the use of superficial remedies which do not reach the basic cause. There is no reason, however, why the well-equipped serviceman shouldn't closely approach 100% complete cures—because he knows!

Time Saved Increases Profits

From the standpoint of the profits of the radio repair shop, it is highly desirable to handle as many sets as possible per working day. This makes time an important factor. It is true that a trained ear plus a little judicious "grid-touching" and "resistor-feeling" identifies a number of common faults, but there are days when the common faults are the exception, and all the jobs that come in are the tough, time-consuming kind. At times like this it pays to be able to make an accurate analysis of the circuit constants, for the more facts obtained, the harder it is for any elusive trouble to stay elusive! As a result of this rapid isolation of the trouble, the day's output of repaired radios may be increased.

Intermittents

Even the bug-a-boo of intermittents may be reduced considerably by using adequate instruments. It is frequently true that the fault which causes the intermittent develops gradually, and there is a good chance that by comparison of voltage readings made at intervals on critical points on the set the

Good Servicemen Need Good Test Equipment *Continued*

offending circuit may be isolated quickly. This is much better than waiting for the trouble to show up, then trying to get readings while the condition exists. Of course, high resistance voltmeters must be used in all such cases, as upsetting the circuits to any considerable extent will usually affect the intermittent. The Sylvania polymeter with its high input resistance is particularly useful on sensitive circuits.

Increase Customer Goodwill

In the present highly competitive field of radio servicing it is desirable to be known for thoroughness, as well as prompt service. It was pointed out in the previous paragraph how good instruments helped get the sets done quickly, and now if the data obtained when the set was first checked is examined, and possibly a few other readings taken on critical circuits not previously covered, it is frequently possible to anticipate and prevent trouble which is impending in the form of a condenser or resistor "going out" gradually, or to replace a circuit element which has changed value to such an extent that the overall performance of the set is impaired, but which is not the immediate complaint. Often this can be done at little additional cost to the customer, and at considerably increased returns in good will and satisfaction. The use of a good oscilloscope such as the Sylvania Type 131 described last month is of great assistance in getting this overall picture.

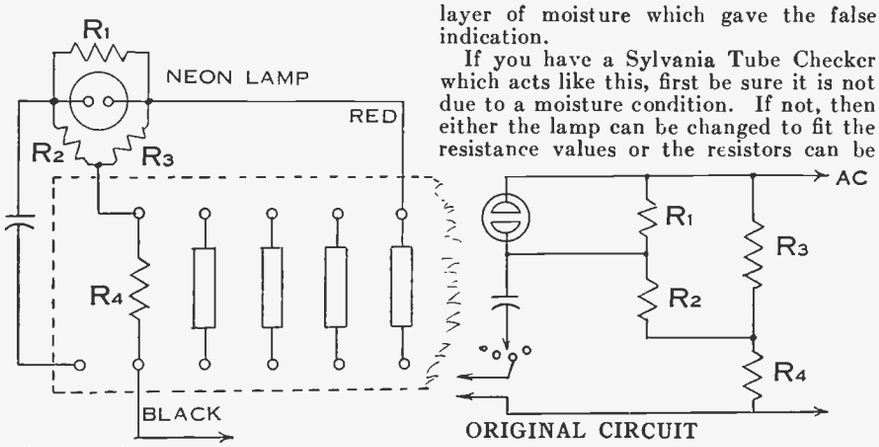
New Circuits

In view of the fact that many 1946 sets have been quite similar to the 1942 models, and mostly AC-DC circuits, the question of familiarization with new circuits has been of little importance since the war. Most of the circuits are "old friends" (or enemies!). However, we all know there is a backlog of circuits developed during and since the war, which are soon due to descend on us in all their novelty and complexity when the set manufacturers can get them rolling. Our "symptom experience" will be of little value then. It takes time for the new circuit-symptoms to become known, and their causes isolated. The only way to beat this time delay is to have adequate test instruments for making basic circuit analysis in terms of electrical units which can be compared with ratings and values indicated on published circuits, and tracing the values in error to their cause.

Experience and Facts

Experience will always speed up work, but there is no substitute for knowing the facts of the case, and these facts are only obtainable through the use of the proper test instruments. They make the difference between rule-of-thumb groping for the answer, and scientific radio servicing.

Supersensitivity of Sylvania Short Test Circuit



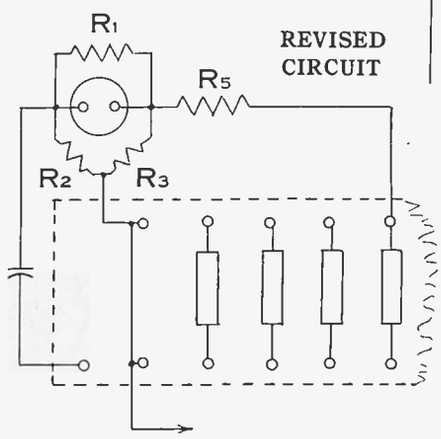
We have had a few complaints from users of the Sylvania Models 139 and 140 Tube Checker that in some cases the short indicator lights up on good tubes particularly in the No. 6 position which indicates heater-cathode shorts. An investigation of this trouble shows it to be due to the normal variations of the components used. Resistors are supposed to be within ± 10% of rated value but the starting voltage of the Neon lamps commercially available vary from 55 to 85 volts. The combination of these two variables may at times add to produce super-sensitivity.

A similar trouble is often found in our laboratory where grid currents of several microamperes may often be indicated when there is no tube in the circuit. In this case it was found to occur only on very humid days. The insulation of the sockets and wiring picked up a surface layer of moisture which gave the false indication.

If you have a Sylvania Tube Checker which acts like this, first be sure it is not due to a moisture condition. If not, then either the lamp can be changed to fit the resistance values or the resistors can be changed to fit the lamp you have. In the latter case we suggest the following circuit and values:

The original circuit was set up to give an indication on a leakage of two megohms or lower, but as explained the normal variations and changes due to aging may send the sensitivity up to 20 megohms or so. The recommended circuit below reduces the sensitivity to about ½ megohm which will be satisfactory for all radio applications.

For those who run into the moisture condition described above and those who would like a little more elaborate short checker circuit the 470,000 ohm resistor shunting the Neon lamp could be changed for a 1 megohm midget potentiometer. This setting could then be set for any desired sensitivity by inserting a 2 megohm resistor, for example, in a tube socket and using the lowest setting on the potentiometer to just light it.



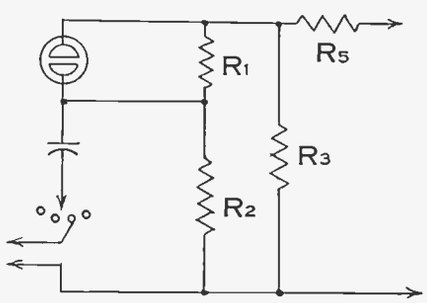
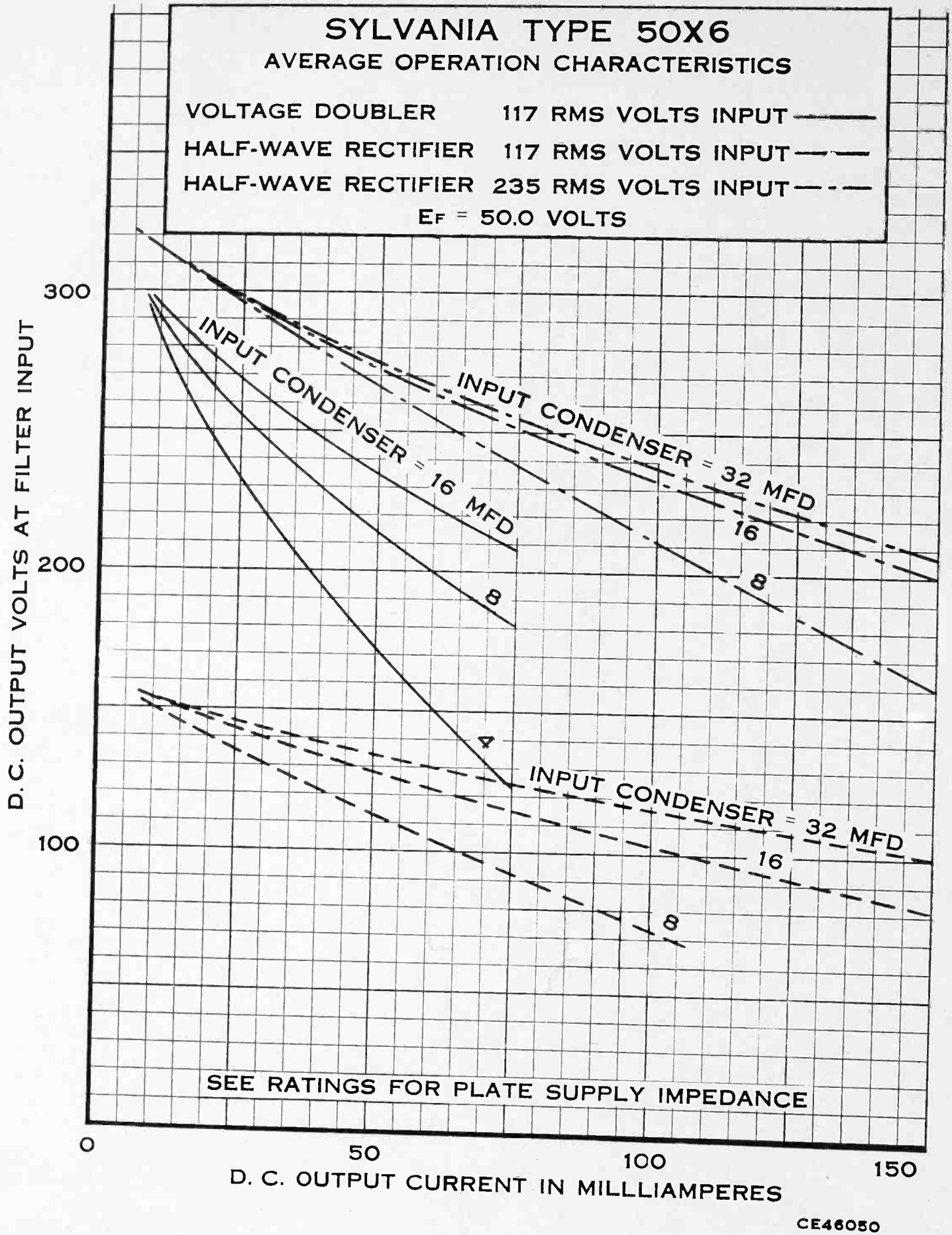


Table of Values

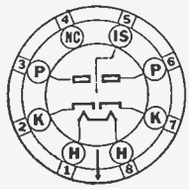
R1	470,000 Ohms
R2	470,000 Ohms
R3	82,000 Ohms
R4	8,200 Ohms
R5	18,000 Ohms


SYLVANIA TYPE 50X6
AVERAGE OPERATION CHARACTERISTICS
VOLTAGE DOUBLER 117 RMS VOLTS INPUT
HALF-WAVE RECTIFIER 117 RMS VOLTS INPUT
HALF-WAVE RECTIFIER 235 RMS VOLTS INPUT
EF = 50.0 VOLTS
300
200
100
0
D.C. OUTPUT VOLTS AT FILTER INPUT
INPUT CONDENSER = 32 MFD
16
8
INPUT CONDENSER = 16 MFD
8
4
INPUT CONDENSER = 32 MFD
16
8
SEE RATINGS FOR PLATE SUPPLY IMPEDANCE
50
100
150
D. C. OUTPUT CURRENT IN MILLLIAMPERES
CE46050

TWO NEW TUBES ANNOUNCED

Sylvania has recently announced a new tube in the lock-in series. This is a voltage doubler for use in AC-DC sets and is rated the same as type 50Y6GT. The load curve is shown on the preceding page.

SYLVANIA TYPE 50X6



7-AJ

Physical Specifications

Style	Lock-in
Base	Lock-in 8 pin
Diameter	1 3/16" Max.
Overall Length	3 5/8" Max.
Seated Height	2 5/8" Max.

Ratings and Characteristics

Heater Voltage AC or DC	50 Volts
Heater Current	0.150 Ampere
Max. Inverse Plate Voltage	700 Volts
Max. Peak Current Per Plate	450 Ma.
Max. DC Output Current Per Plate	75 Ma.
Max. Heater-Cathode Voltage	350 Volts
Tube Drop at 150 Ma. Per Plate	22 Volts

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

Single Section Half Wave Rectifier—Condenser Input Filter

Heater Voltage AC or DC	50	50	50 Volts
Heater Current	0.150	0.150	0.150 Ampere
Plate Supply Voltage AC RMS	117	150	235 Volts
Filter Input Condenser	16	16	16 mfd.
Minimum Total Effective Plate Supply Impedance	15	40	100 Ohms
D. C. Output Current	75	75	75Ma.

BOTH SECTIONS AS A VOLTAGE DOUBLER

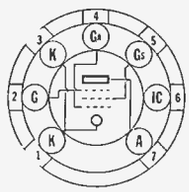
	Half Wave	Full Wave
Plate Supply Voltage AC RMS	117	117 Volts
Filter Input Condenser Per Plate	16	16 mfd.
Minimum Total Effective Plate Supply Impedance	30	15 Ohms
DC Output Current	75	75 Ma.

A new cold-cathode relay tube has just been announced by Sylvania. It is made in the miniature style bulb and was developed to give more reliable performance to the Electroflash described in Sylvania News for July 1946. The use of this tube also reduces the shock hazard and eliminates arcing at the switch contacts because of the low voltage and current requirements of its trigger grid.

For most applications the shield grid is left floating but it may be tied to the cathode through a 10 megohm resistor in order to increase considerably the hold-off voltage. This requires, however correspondingly higher values of triggering voltage.

Since one of the more important applications of this type is in the electroflash unit a circuit showing this use is given below. A data sheet is available for those interested in other applications.

SYLVANIA TYPE OA5



6-CB

Physical Specifications

Style	Miniature
Bulb	T 5½
Diameter	¾" Max.
Seated Height	1 3/8" Max.
Overall Length	1 5/8" Max.
Mounting Position	Any

Ratings

Minimum hold-off voltage DC (Note 1)	1500 Volts
Maximum keep-alive current	60 μa
Maximum anode operating voltage DC	1000 Volts
Minimum anode voltage DC (Note 2)	500 Volts
Minimum trigger grid firing voltage (Note 3)	+180 Volts
Minimum trigger grid pulse voltage (Note 3)	+50 Volts
Maximum trigger grid pulse current (Note 4)	40 μa
Maximum discharge capacitance	0.5 μfd
Maximum power input (Note 5)	1.0 Watt
Maximum repetition rate (Note 5)	
Minimum peak cathode current (Note 6)	10 Amperes
Ambient Temperature	-40 to 60° C.

Typical Operating Conditions

Anode Voltage	750 Volts
Trigger grid bias	+90 Volts
Trigger grid resistance	0.25 Megohm
Discharge condenser	0.25 μfd.
Keep-alive current (Iga)	50 μa.
Trigger pulse voltage	85 Volts

NOTE 1: The hold-off voltage is defined as that anode voltage at which the tube will fire without the application of a triggering pulse to the trigger grid. The value specified here is given for a trigger grid bias voltage of +90 volts and a keep-alive grid current of 50 μa.

NOTE 2: Operation with anode voltages as low as 350 volts is possible but requires considerably higher trigger pulse voltages.

NOTE 3: The trigger grid firing potential is defined as the minimum instantaneous grid potential required to fire the tube. This potential is the sum of the steady bias voltage and the trigger pulse voltage.

NOTE 4: Measured with a keep-alive grid current of 50μa. and +90 volts bias on the trigger grid.

NOTE 5: The maximum power is obtained from the equation $W = \frac{1}{2} CV^2f$ where C is the discharge capacitance in microfarads, V is the anode voltage in kilovolts and f the repetition rate of flashing in pulses per second.

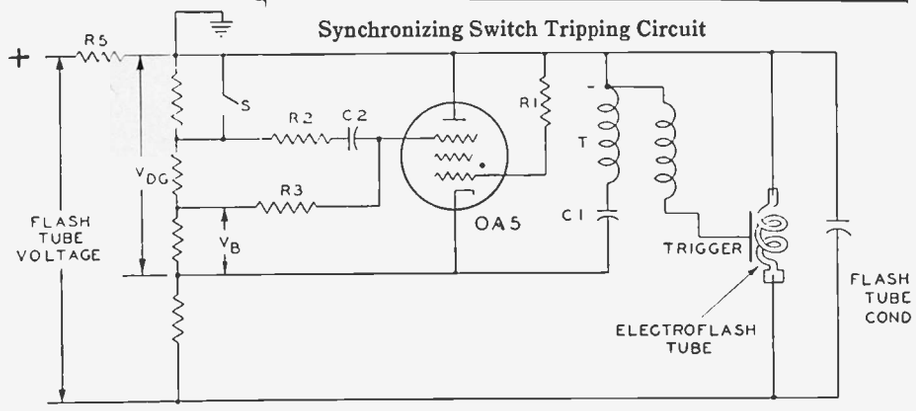
NOTE 6: Minimum peak current required to initiate arc.

Sylvania type OA5 is licensed under the tube patents of Edgerton, Germeshausen, and Grier, but no license is implied under their circuit patents.

NOTICE

We have received a large number of requests for the proper Sylvania Tube Checker settings for many of the smaller transmitting tubes, newly announced types and some very old types. These and all recent corrections are now being printed on a convenient card and will be sent to any owner of a Sylvania Checker on request. A postcard to Box 431, Emporium, Pa., will be sufficient.

Synchronizing Switch Tripping Circuit



BRAINSTORM DEPARTMENT

Another way To Replace "C" Containing Rings

In the September issue of The Sylvania News (Brainstorm Dept.), we ran a story on Jake Hoover of San Angelo, Texas and his tool to remove "C" containing rings from band switches, volume controls and dial drive assemblies.

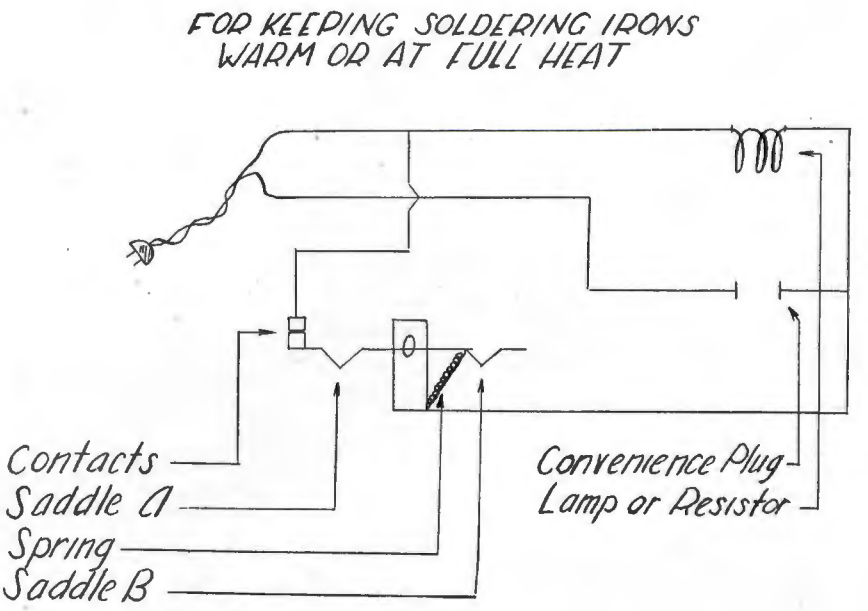
Here's even a simpler idea submitted by Mr. L. E. Bond of Buckhannon, West Virginia.

The tool is made from a five or six inch length of hack saw blade. The teeth are ground off. Then, starting back about an inch from the point, grind to a thirty degree angle. Dub the point back about 3/16ths of an inch (45 degree angle) and grind the blade at the point thin enough so that it will slip into the "C" ring slot. Wrap friction tape onto the upper part of the blade for a handle

Insert the point of the tool in the opening of the "C" ring and press downward and forward. The downward pressure prevents the ring from turning in the grove while the forward pressure opens the ring.

Soldering Pre-heat

Here is a variation on a preheating arrangement for soldering irons. The idea comes from Gerald Lanks, Instructor of Electronics, McKeesport Vocational School, McKeesport, Penna. It is an easy-to-build idea that cuts the cost of soldering in half.



Placing the soldering iron in saddle "B" (see cut) closes the contacts, placing the convenience outlet in a parallel circuit. The iron is at full-heat.

Placing the iron in saddle "A" opens the contacts, placing the lamp and iron in series, which keeps the iron warm but not at full-heat. This not only prolongs the life of the iron but saves time waiting for a cold iron to heat.

The lamp or resistor can be varied to allow any amount of current through the iron—thus any degree of heat.

DATE STAMPER USED TO NUMBER JOB RECORD CARDS

Here's another idea for numbering job record cards! Leslie Payne of Horsham, Canada writes in that he uses a regular date stamper for the job. He says that it takes a little time to rotate the center numbers for each card but that it is worth the expense saved. Mr. Payne is able to stamp the job number and the date at the same time.

He uses another date stamper to mark the ninety day guarantee on the back of the cards.

DO YOUR SERVICE STICKERS STICK?

If your Service Stickers or shipping labels don't stick, it is probably due to:

1. Too much water applied to the labels.

2. Dirty brushes in tape dispensers. Glue collects on the brushes resulting in the uneven distribution of moisture. Dispensers and brushes should be cleaned frequently with hot water.

3. Metal chassis that were not cleaned before the stickers were applied.—Clean chassis with alcohol to remove dirt and grime.

DISTRIBUTORS DELUXE

DE MAMBRO RADIO SUPPLY CO. HAS BRANCHES IN FOUR NEW ENGLAND CITIES

Pictured above, left to right are: Edwin DeGroat, Manager of the Sound Department; Edwin Pfiffner, Manager of the Amateur Department; Harvey Varnet, Sales Manager; and Anthony DeMambro, General Manager of the Providence store.

Mr. Joseph DeMambro founded his Radio and Supply Co., 1111 Commonwealth Avenue, Boston, in 1934—just the one store, with very little capital to go on. Since then, it has grown into an organization of seventy-eight people, with branches in four of the principle cities of New England—Boston and Worcester, Massachusetts; Providence, Rhode Island and Manchester, New Hampshire. Plans are afoot to open branches in other New England cities.

Above: the self-service island designed by Mr. DeMambro.

Mr. DeMambro feels that his self-service plan is largely responsible for the number of customers that pass through his store each day. Mr. DeMambro designed the display islands himself (see picture). Self-service promotes sales by suggestion—each item on display poses the question, "are you running low on this item?" Sales have increased as much as 50% in some branches, thanks to the system, Mr. DeMambro reports.

Below: the Sound and Amateur Studio. The studio is sound proofed with acoustical tile and double plate glass windows. Any unit may be demonstrated with any amplifier on display through a switching arrangement.

SEATTLE DISTRIBUTOR ADDS INDUSTRIAL AND ENGINEERING SALES DEPT.. TO STORE

To say that the Seattle Radio and Supply Co. is expanding would be an understatement. At their Seattle address, 2117 Second Avenue, Mr. Revees, President, and his Company have expanded, re-decorated and re-designed the former site into the attractive looking store that it is today. The Ham department has been enlarged and an Industrial and Engineering sales department added. The store front takes up four times as much of Second Avenue as when "Seattle" first opened.

Below: The latest in service counters.

Above: This is the main entrance to Seattle Radio. Note use of self-service and specialized displays. General offices are upstairs, with oriental theme in the railings and the color scheme—Chinese Red and Robins Egg Blue (! : Ed.).

Above: The new Industrial and Engineering Sales Department, latest addition to the Seattle Radio and Supply Company, Inc.

SYLVANIA ENGINEERS PRESENT PAPERS BEFORE ROCHESTER CONVENTION

Mr. H. Heins and Mr. M. Liimatainen of Sylvania's Electronics Division presented a paper before the IRE, RMA Rochester Convention entitled, "The Application Of Selenium Rectifiers To Radio Receiving Sets."

The selenium rectifier, the product of prodigious research in the field of metal rectifiers, possesses inherent advantages over other metallic rectifiers due to its wider operating temperature range and higher voltage characteristics. Among these are higher efficiency, lower weight and smaller size for a given requirement.

The low voltage limitations of the rectifier have been overcome. The purpose of the paper was to present some of the important properties of the new, high back-voltage rectifier in relation to radio receiver design.

"In spite of the present limitations of maximum operating temperature," the speakers said, "we feel that further research and development will lead to a rectifier which will overcome the present temperature limitation. It is our belief that selenium rectifiers will find widespread use in electronic and radio equipment and should eventually replace some vacuum tube rectifiers."

New Developments In Sub-Miniature Electronic Tubes

"The sub-miniature radio tube was born of World War II," Mr. Gehkre said, speaking before the convention, "for use in the proximity Fuse. The mechanical strength of the tube was paramount. The tiny tube was built to stand the tremendous shock encountered when fired out of a gun.

"Yet the electrical efficiency being important to the quality of the tube, Sylvania pushed work along that line as well.

"The commercial versions are designed to have a life expectancy of 500 hours or more."

Application of the tube to industrial uses has been an important part of the development. Applications have been made in the fields of aircraft radio and electronic equipment, small side impedence

(*Continued on page G-40*)

SCRAPBOOK OF ELECTRONIC PRODUCTS

POLYMETER BEING USED TO TEST RADIO AND ELECTRONIC CIRCUITS

Sylvania reports the use of its Polymeter for convenient and accurate measuring of a wide range of voltage, current and resistance values found in home radio receivers, FM and television sets, and many types of industrial electronic apparatus.

Designed particularly for accurate measurement of electrical conditions in circuit components operating with power, audio and radio frequencies up to 300 mc., the new instrument permits radio and electronic repairmen to quickly isolate condensers, coils and resistors when faults occur and check circuit operation after replacements are made. An unusually compact vacuum tube probe is provided for modern signal tracing technique. First to employ a tiny proximity fuse type tube, Sylvania has produced a midget, thumbsize probe utilizing the type 1247 proximity fuse type tube.

Features of the new type 134 Polymeter include balanced amplifier circuit practically independent of line voltage and normal amplifier tube changes; preset factory adjustments permitting correct zero setting for all ranges through one front panel adjustment; convenient range switch for correct multiplier values; five jacks for plug-in test-lead readings of a-c volts, d-c volts; ohms; amperes and milliamperes.

Measurement ranges of the Polymeter include; d-c volts, 0-3, 0–10, 0–30,0–100, 0–300, 0–1000; a-c volts a-f, 20–15,000 cps, 0–3, 0–10, 0–30, 0–100, 0–300; r-f volts, 10 kc.–300 mc., 0–3, 0–10, 0–30, 0–100, 0–300; d-c current, 0–3 ma., 0–10 ma., 0–30 ma., 0–100 ma., 0–300 ma. 0–1000 ma., 0–10 amperes; resistance, 0–1000 ohms, 0–10,000 ohms, 0–100,000 ohms, 0–1 megohms, 0–10 megohms, and 0–1000 megohms.

OA5 Trigger Tube Is Available

The Sylvania Type OA5 Trigger Tube (see October issue of The Sylvania News) is now obtainable from your Sylvania distributor.

The OA5, another product of Sylvania's Electronics Division, was designed for the Wabash Sylvania Electroflash. It is an inert-gas-filled internally-triggered cold cathode trigger tube designed for electronic relay and switching service that involves extremely high instantaneous peak currents.

Oscilloscope For Radio Servicing

The new oscilloscope, weighing only 18 lbs, is mounted in an attractive steel gray crackle finished cabinet measuring $10\frac{3}{4}''$ high, $8\frac{1}{8}''$ wide and $13\frac{3}{4}''$ deep. Signal frequency range from 15 to 40,000 cycles is provided with a five range selection control and a fine frequency control which permits close adjustment to any desired frequency. Visual study of wave form is provided by a 3'' cathode ray tube designed for 650 volt deflection plate operation.

Sweep circuit of Sylvania type 131 oscilloscope is built around a type 884 gas triode oscillator. Tube complement includes 3AP1 cathode ray tube; 5Y3GT/G rectifier; 7Y4 rectifier; two 7O7 amplifiers; and the 88 gas triode oscillator. The oscilloscope is rated at 105/125 volt; 50-60 cycle; 40 watt input.

FACTS & FIGURES . . .

October set production . . .

Radio set production for the month of October has been set at a new high over previous months—1,670,444 sets. This is 350,000 over September figures.

23,793 FM sets were produced as compared to the 17,541 produced in September.

National Radio Week . . .

The last week of November was set as National Radio Week, marking the 26th birthday of radio broadcasting. This was the week set aside to commemorate the contributions that radio broadcasting has made to the American way of life.

A book, "The First Quarter Century of American Broadcasting" was presented to President Truman, to RMA President Cosgrove and to chairmen of the boards of the radio networks.

"The real sources of joy in this life are not the results of easy tasks but of hard ones."

—Sir Wilfred Grenfel

DID YOU KNOW . . .

. . . that a three-inch length of the finer-than-hair filament wire used in electric lamps is strong enough to hold 200,000 times its own weight?

. . . that in England, the electronic tube is called a valve?

. . . that the electrical manufacturing industry uses fifty to sixty percent of all the copper mined in the United States?

. . . that there is now a method to eliminate the dead spots in radio communications, such as in railroad tunnels?

. . . that there is a new infra-red heat lamp manufactured by Sylvania Electric that relieves muscular aches and pains and performs many household drying chores?

. . . that there is an electric lamp that makes possible secret two-way conversations over an invisible infra-red light beam?

. . . that an atom is so tiny that there are 20,000,000,000,000,000,000,000,000 of them in an ounce of hydrogen?

H-F RADIO USED IN CAR-TO-CAR TELEPHONE SERVICE

Car-to-car telephone conversations have been made possible by the combining of h-f radio transmission with the "party line" of the telephone's earlier days. In the future, the Mobile Radio-Telephone Service may be installed in all automobiles, but for the present, limited output and the availability of only one radio channel, will hinder the wide-spread use of the units. The FCC has alloted the 152-163 megacycle band solely to the Mobile Radio-Telephone Service.

In its release, the Bell Telephone Co. stated that the new service would not delay production and installation of standard telephone equipment.

The service will require the installation of special radio gear and heavy-duty car battery and generator.

2E24 radio tubes are employed in the transmitter. In the receiver, ~~types 9001, 6AK5, 6AK6, 6AL5,~~ 6X5 are used.

According to the New York Herald Tribune, a preview of the new set-up was given to newspaper reporters. The car used in the demonstration had only a slender 18 inch antenna protruding from the roof to distinguish it from other cars. In the rear baggage compartment was a compact sending and receiving set, about the size of a medium-sized suit case. The telephone, a conventional hand set except for a button on the hand grip, was cradled under the dash board. While the car rolled through the traffic of West Street, New York City, a reporter telephoned into his city desk and held a four-minute conversation that was clearly heard at both ends.

Sylvania Engineers . . .

(*Continued from page G-39*)

transformer devices, small personal radios and others.

Mr. Gehkre also pointed out the advantages of wired-in T-3 tubes to reduce unwanted capacity and inductance. This advantage is particularly applicable to the manufacture of television and FM sets.

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