Techni-talk
COMPLETE ELECTRONIC SERVICING INFORMATION
radio · tv · hi-fi

VOL. 12, No. 4 AUG.-SEPT., 1960

GE WIRELESS REMOTE CONTROL SYSTEM IV

In the last issue various service problems were given with suggested servicing procedures. In this issue various adjustments to the receiver will be described.

Receiver Adjustments

Receiver alignment usually requires the use of a VTVM as an indicating device. However, in some cases it may be satisfactorily accomplished if the detector isolating network shown in Fig. 1 is used with the VOM. The network may be enclosed in a pencil type probe, if desired, for convenience. This probe is to be used with the d-c setting of a 20,000 ohm per volt VOM.

Sensitivity Control Setting

To provide a simple field check of the sensitivity control, manufacturing is placing a mark on the label adjacent to the end of the slot in the sensitivity control shaft. Where a control is found with the slot moved radically from the indicated mark, the sensitivity may be misadjusted.

NOTE: On those models where the remote receiving antenna is mounted in front of the large speaker, there appear two marks on the label. The slot in the shaft should be aligned with the red mark in this case.

If for any reason it becomes necessary to re-adjust the sensitivity control, R605, the following procedure is used so as to obtain optimum receiver performance.

1. Tune the television receiver to an active TV channel and adjust the receiver for normal picture.

2. Adjust the remote receiver sensitivity control to full clockwise position.

3. Connect a VTVM, adjusted to read AC, to Test Point II (see Fig. 2) of the remote receiver. The ground lead of the VTVM is connected to receiver chassis. Turn the horizontal hold control of the TV receiver off frequency. (If necessary, snap channel selector off and then back on channel to obtain picture which is out of sync, horizontally.) The horizontal control is turned to a point where maximum AC voltage is obtained on the VTVM.

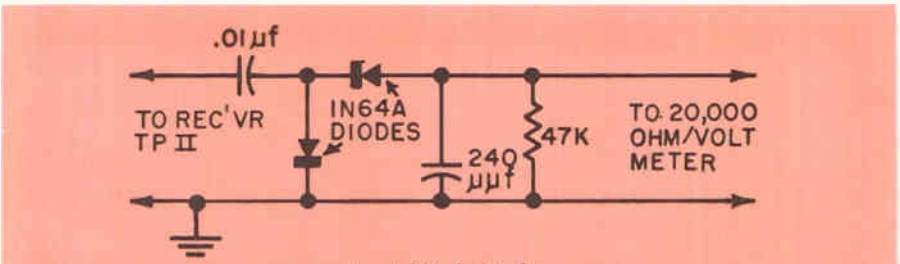


Fig. 1 Diode Probe

4. Carefully move the remote receiver antenna so that minimum AC voltage is obtained.

5. Adjust the remote receiver sensitivity control to obtain 5 volts RMS of horizontal interference as indicated on the VTVM.

NOTE: Interference (other than that caused by two remote systems in close proximity) may cause the remote functions to operate. In such instances it will be necessary to adjust the sensitivity control for slightly less than 5 volts-RMS mentioned in Step 5.

Antenna Positioning (Mounting Angle)

If the mounting angle of the plastic housed wireless remote receiver antenna is disturbed, it must be repositioned for minimum interference from the TV receiver.

Connect a VTVM to Test Point II on the remote receiver. Connect ground lead of VTVM to remote receiver chassis ground. (A 20,000 ohm/volt meter can be used in conjunction with a simple detector as shown in Fig. 1.)

Antenna Peaking

It is very important to have the Remote Receiver antenna peaked for maximum pickup of the remote control transmitted signal. To peak the antenna proceed as follows:

1. Connect a VTVM to Test Point II on the Remote Receiver. Connect ground lead of VTVM to Remote Receiver chassis ground. The 20,000 ohm per volt meter may also be used if the detector probe outlined in Fig. 1 is provided.

2. Have someone transmit a control signal (channel select) from about 20 feet away from the receiver.

3. Adjust antenna trimmer for maximum AC reading on the meter.

Reed Relay Adjustment

Erratic operation may be experienced where adjacent reeds are caused to vibrate in "Sympathy" with the one representing a selected function. When this condition exists, the "off ending" reed contact points may be adjusted.

Prior to adjusting reed contacts, the "Audio Frequency Alignment" of the transmitter should be checked. This alignment procedure will be given in the next issue.

Reed contact adjustment procedure:

1. Connect a VTVM, scope or diode probe and 20,000 ohm/volt meter, to Test Point II of the remote receiver.

2. Insert a dummy antenna in the antenna input jack. (See Fig 3)

(Continued on Page 6)

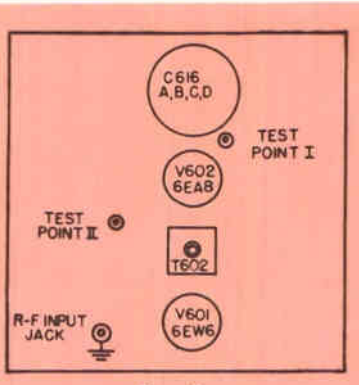


Fig. 2
Test Point & Adjustments

SUCCESSFUL SERVICE MANAGEMENT

PROMOTE YOUR BUSINESS

By Fred J. Nataly
Distributor Advertising Monoger
Electronic Components Division
Generol Electric Compony, Owensboro, Ky.

Attracting new business — vital to your pocketbook, vital to keep pace with the expanding service industry — can and must be an easy, normal part of your operation.

No longer can one afford to ignore promotion as "too big a job to undertake," or discuss it as "too much time and money." It is not so complicated that only experts are worthy of the effort. The unknowns in this critical aspect of a dealer's business are gone. All that is required to succeed here is familiarity with the fundamentals, the tools of promoting your business and attracting new customers. You and your own good judgment have only to choose the tool which will accomplish the end you have in mind. You can, and must promote your business.

Basically, you can attract new business in two ways: (1) By personal selling, and (2) by advertising or sales promotion. Personal selling is achieved through the actual contact that you and your employees have with customers and potential customers in every-day business and social activities. More often your personal selling traits are constantly at work for you, by way of your apperance, your manner of talking, or your promptness. Evaluate your efforts in attracting new business by personal selling:

1. Do you make a continuous effort to meet new people?
2. Are you pleasant and personable both on and off the job?
3. Are you a member of social and civic organizations?
4. Do you take an active part in community affairs?

Remember, the more people you talk to, the more you learn — especially about business opportunities.

However, attracting new business may require more than personal selling. Here is where advertising and sales promotion come into play. And here is where a familiarity with the tools of advertising will help you increase the effectiveness of your efforts to attract new business.

The tools for advertising and sales promotion are such media as newspapers, radio, television, direct mail, signs, and window displays. These are used to present well-thought-out messages promoting the services that you offer.

What to say, and how to say it, and where to say it are the prime questions in advertising and sales promotion. General Electric has a whole catalog of advertising and sales promotion aids which provide sales messages for any media you desire. You must add your own personal touch, and of course must choose the media. Let's look at the basic media:

Direct Mail

Direct Mail is the least expensive method of getting your name and message to a *specific* group of potential customers. Properly handled, there is very little wasted coverage, for your message is beamed to a preselected segment of the population. Results are as good as your mailing list. Your job tickets are a good source of names, as is a telephone directory or city directroy cross-indexed by street and number for specific neighborhood coverage. Available from G-E are any number of postcards and envelope stuffers which you can use to remind customers of service specials. For instance, run a direct mail program on portable or car radios, or, using a seasonal approach like baseball, urge them to bring in their sets for repair.

Local Newspapers

Because of the relatively low cost of newspaper advertising, per reader, and the fact that practically all families read the newspaper, this medium can be a second most effective means of presenting your message. An important advantage is that ads can be placed in newspapers on very short notice, thus enabling you to capitalize on any timely situation that may arise, such as a storm which may have knocked down many antennas in your area.

Of course newspapers have a few shortcomings which you should keep in mind. The ads are short-lived, since people usually keep a newspaper only one day. Also, a newspaper's circulation area may extend beyond the normal range of your business activity. In this case you may be paying for wasted coverage.

Yellow Pages

One of the fundamentals of advertising for you is that your name appears in the yellow pages. It is estimated that more than 50% of the families in an area refer to their classified telephone directory at least once a week.

More than one listing too, may be applicable to you. For instance you may do repairs on marine radio or hi-fi. Your name under these headings would get you the customers. Your G-E distributor can provide you with illustrations and copy suggestions.

Point of Purchase

Your store front, including the windows, can be one of your most effective yet least expensive means of advertising.

Signs draw a lot of attention. Your distributor can show you some colorful ones for both inside and outside your shop. In the store window itself you can use material made available to you regularly by your distributor. Window display sets which attract attention of passersby, tell a hard-hitting service story if used effectively. Window displays are available on such specials as car radios, portables, hi-fi. Background decoration and giant tube cartons, are available and help stop passersby. Valance kits with which you can decorate your window according to your own good taste are a good idea.

Outdoor

(Including Truck Panel)

Your service truck or car can be a billboard on wheels. It takes your name before more people than would ever normally visit your shop. Give your truck the appearance of professional efficiency by keeping it clean, freshly painted, and well-identified with your store name on both sides and on the back door. Your phone number should also be displayed prominently.

Your distributor can provide you with certain truck identification material that is available from G-E, decals for example. Or, you can have your truck painted by a professional sign painter.

Small bumper signs, magnetic door panel signs, or window cards are effective on standard sedans or station wagons. They can be removed when the vehicle is used other than for business.

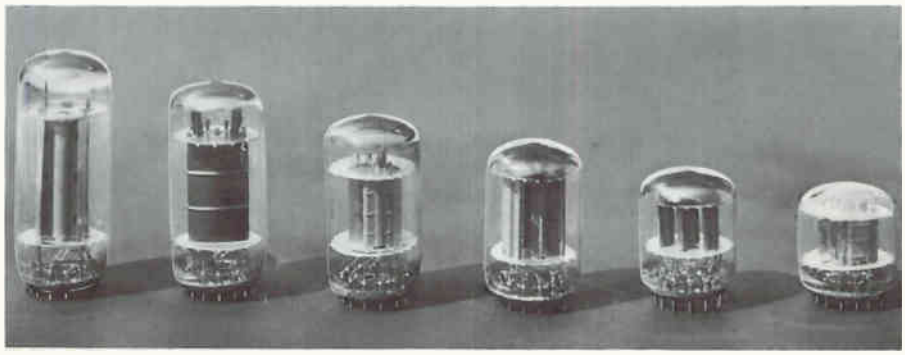
Radio and TV Commercials

If your plans are big and you want to reach a lot of people, you should investigate both. Professional radio commercial scripts and records covering a wide variety of approaches are available through your G-E distributor. He can also provide TV spot cards on a variety of messages. These media must be used properly, however, to avoid excess waste.

Cooperative Displays

A relatively inexpensive advertising medium. It is especially advantageous if your shop is not too close to the town's business district. The simplest of cooperative display advertising consists of you and another businessman exchanging display cards or posters.

GENERAL ELECTRIC PROUDLY ANNOUNCES THE COMPACTRON



These six COMPACTRON units are the forerunners of a line that is expected to expand to 100 in the next two years.

A new electronic device that combines into one unit the functions now performed by several components in home-entertainment equipment was recently announced by the General Electric Company.

The device, called COMPACTRON will make it possible for manufacturers of radios, televisions, high-fidelity sets and electronic organs to achieve, in the near future, significant size reductions in their products.

Announcement of the compactron development was made by I. D. Daniels, general manager of General Electric's electronic components plants at Owensboro, Ky. Daniels said the development work on this device began several years ago, and recently was stepped up when the need became apparent for a more compact circuitry than possible with present commercial miniature receiving tubes.

"At the same time," Daniels added, "there existed the need to get costs down appreciably below those of tubes, while preserving the superior performance characteristics of tubes in relation to other existing miniaturized devices."

Potential electronic device advances now made possible with this new development are:

A television receiver that could be designed with 10 COMPACTRON units, replacing present TV set circuits that require 15 tubes and three diodes, or 24 transistors and 11 diodes; a 12-volt automobile radio using two COMPACTRONS that could obsolete the present four-tube car radio design; a two-COMPACTRON unit table radio that can provide the same functions as five tubes or seven transistors, and monaural high-fidelity equipment using four COMPACTRON devices rather than either six tubes or 11 transistors.

Six Units In Development

There are currently six compactron units in development at Owensboro.

These developmental models now include the following, compared to the tubes they displace (in parentheses).

For table radios:

1. Combined oscillator, converter and intermediate frequency amplifier. (12BA6, 12BE6)
2. Combined second detector, audio amplifier, audio power output amplifier and rectifier. (35W4, 50C5 and 12AV6)

For television:

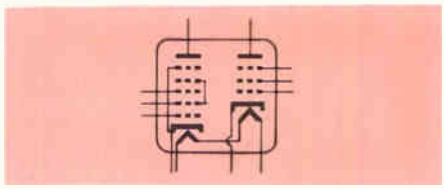
1. Horizontal oscillator and automatic frequency control. (6CG7 and 6AL5)
2. Horizonal damping diode (single diode). (6AX4GTB)
3. Vertical deflection amplifier and oscillator. (6DN7)
4. Horizontal deflection amplifier. (6DQ6B)

The single-function compactron designs, will replace conventional tubes on a one-to-one-ratio. These types were necessary either because the power requirement was close to maximum limitations for one unit, or because of the dictates of good design practice imposed by the need for high voltages in some functions.

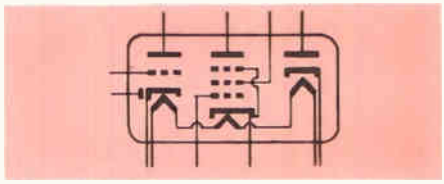
Significantly Smaller

The advantage of single-function compactrons lies in the fact that the units are significantly smaller, and thereby afford equipment manufacturers the opportunity to produce smaller, more compact receiving sets.

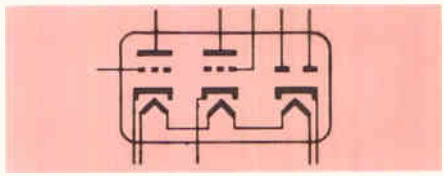
General Electric's plans for broadening the compactron line include the introduction, in the next 12 months, of approximately nine more types. Long-range plans for integrating a wide variety of functions into one unit indicate that the line eventually will comprise from 75 to 100 types.



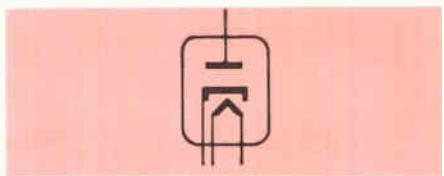
PENTODE - HEPTODE — The Pentode is intended for use as an intermediate frequency amplifier, and the heptode is a frequency converter. Use of the device is compact, series-connected heater, radio receivers is contemplated.



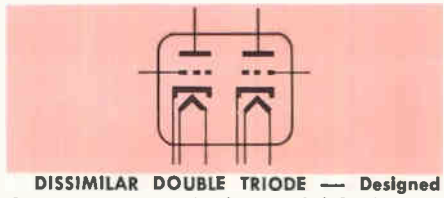
DOUBLE-DIODE - TRIODE - PENTODE — One diode is intended for use as a power rectifier, the other as a signal rectifier, the triode as an audio-frequency voltage in compact, series-connected heater, radio receivers is contemplated.



DUPLEX-DIODE - TWIN TRIODE — Designed for television horizontal phase detector and horizontal oscillator applications with separate cathodes for the triode sections and another cathode common to the two diode sections. The diodes are intended for horizontal phase detector service, and the triodes for horizontal oscillator service

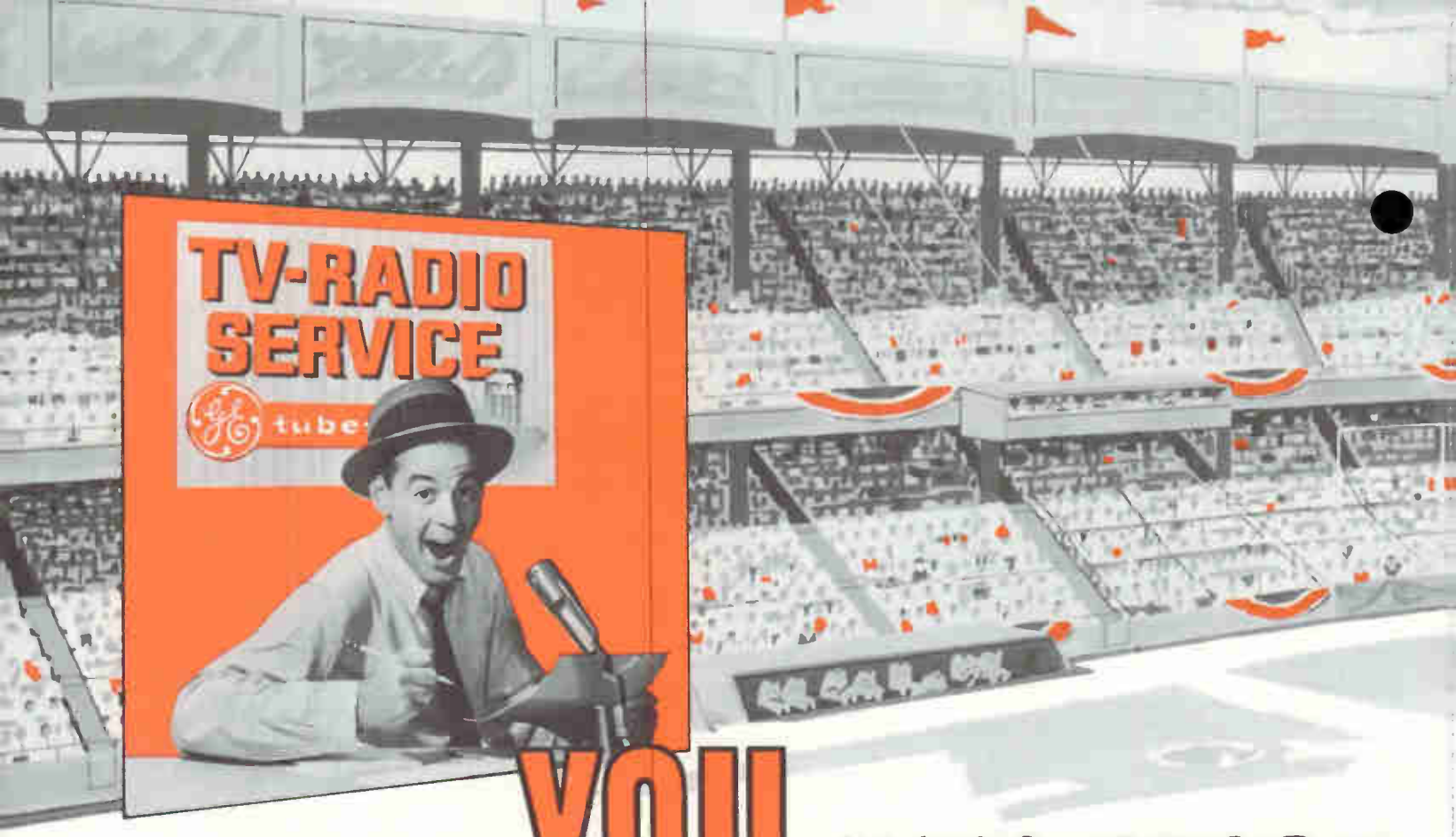


DIODE — Single heater-cathode type diode for service as the damping diode in the horizonal-deflection circuit of television receivers.



DISSIMILAR DOUBLE TRIODE — Designed for use as a combined vertical-deflection oscillator and amplifier in television receivers.

BEAM POWER PENTODE — Primarily designed for use as the horizontal-deflection amplifier in television receivers.

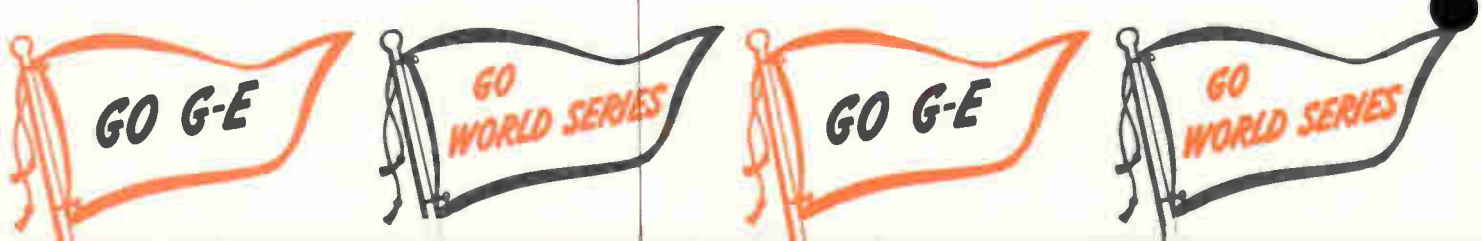


YOU WILL SCORE. G-E WORLD SERIES

Spotlights you for quality TV service right when demand hits its peak! The year's top business, profit-builder for technicians!

All 55 million TV owners will want their sets to be in first-class condition when the umpire calls "Play ball!" The neighborhood technician whom owners know best will be the one to benefit. Don't miss this profit opportunity! General Electric is going all-out to help you—by telling World Series fans whom to call, where to go for fast, reliable TV check-up. *To the technician who installs G-E tubes! He's the best! And just around the corner!*

Long before the first day's pitchers have been named, G-E displays and promotions will be pulling customers into your shop. Once play starts, fans in most large cities will receive frequent radio reminders that you are ready to serve them fast and well. Go World Series with General Electric! Get ready for a B-I-G two weeks of business! See your G-E tube distributor! *Distributor Sales, Electronic Components Div., General Electric Company, Owensboro, Ky.*



IN EVERY INNING WITH PROGRAM!

GO WORLD SERIES
to ring up service dollars!

Timely, high-impact display items like these will draw more customers to your shop, pay off in stepped-up income. General Electric has ready for you many other World Series displays, advertising helps, and novelties, all new and exciting. See them today at your General Electric tube distributor's!

Progress Is Our Most Important Product

GENERAL ELECTRIC

311-403

BENCH NOTES

AUTO RADIO — 59 FORD

I had a 1959 Ford radio come into the shop for distorted tone and low volume. We hooked it up to our test speaker on the bench and it played satisfactorily. Back in the car it was distorted. Car speaker was okay. On checking over the set we found that the speaker receptacle was ungrounded. After applying a soldering iron at this point it was back to normal. We have had two more like this one since.

L. Hartman
Lincoln Radio Co.
4389 Greenway
S. Euclid 21, Ohio

Component Removal

I have tried all the gadgets that are made to remove components from printed circuit boards, but the finest method yet is a foot operated tire pump.

Heat the lug with your soldering iron and blow off the solder with the air pump. After the solder is free from each lug, just remove component. It may be a good idea to lay masking tape just around printed circuit of component to be removed to keep solder when blown with air, from going on other parts of board.

Mel Fineburg
1364 South Cochran Ave.
Los Angeles 19, California

QUICK CHECK FOR CAR RADIOS

Pull vibrator and rectifier from set.

Apply heater voltage and apply d-c voltage from separate power pack of about 150 volts. Connect B+ to first filter capacitor and negative to chassis.

If set plays trouble is in vibrator or rectifier.

Anthony Tomashunis
626 Winters Ave.
W. Hazleton, Pa.

RADIO INTERMITTENT

We had a Zenith radio, Model L515 (Chassis 5L06) in with a complaint of intermittent sound and sometimes it would be distorted sound. The sound distortion was remedied with a new 50C5 and new audio coupling capacitor. However, the intermittent proved difficult. All voltages and resistances measured within tolerance. Besides that it would become intermittent only when it wanted too. Sometimes it would play for days or weeks. Finally we caught the intermittent. The i-f's checked OK on the signal tracer, signal injection proved the converter working. The volume control center tap was touched and a loud hum was heard. After days of checking everything, we tested the filter capacitor even though all B-plus checked OK but was replaced anyway. That finally solved the mystery.

When replacing the filter capacitors, be sure to replace the entire dual can electrolytic. Replacing one will not solve the intermittent.

Brian Chin
Electron Radio-TV Service
22-24 Mulberry Street
New York 13, New York

PIX TUBE HARNESS PATTERN

On TV sets, RCA - Philco - Bendix etc., turn C-R tube face down on cardboard with band still on front of CR tube. Mark holes on cardboard for a pattern. Then use the pattern to line up holes for new CR tubes. This speeds up installing new CR tubes. Make two patterns. One for 17" and one for 21" tube.

W. C. Cawthon
6 Baptist St.
Pelzer, S. C.

SOLDERING PC BOARDS

Here is a very satisfactory method for removing solder from the holes in printed circuit boards. Purchase a medium size syringe with a bulb at least 2 in. in diameter and apply its nozzle at the hole on top side of board. Heat solder on etched side and squeeze bulb quickly and the stream of air will clean the hole very nicely. Will work equally well on large or small holes.

Clarence A. Bloomdahl
8515-40th Ave. N.E.
Marysville, Washington

SHOP HINTS

For some time we'd been puzzled by the fact that some TV sets we had apparently cured of intermittent faults, kicked back after several days in the customer's home.

Then we figured out that we repaired the sets in a frigid, air conditioned lab, so the intermittents at times failed to develop because they never reached break-down temperature. After repairing a set now, we move it outside the cool lab to a room devoid of air conditioning, as a double check, and this has materially lessened the number of call-backs.

Harry J. Miller
Advance Television Radio Service
941 42nd St.
Sarasota, Florida

PC SOCKET REMOVAL

I believe I have stumbled across something that will be very helpful to all technicians.

When removing miniature I.F.s, tube sockets etc. from a printed circuit board, I heat the contacts with a soldering gun and then blow out the melted solder with an air hose. The component can then be easily lifted out. The melted solder that is blown on to the board can then be easily removed with a screw driver or pick.

It is by far the best method I have ever used on a printed circuit.

The air hose will also keep the temperature down on the board.

Peter Siemens
Graham Bros.
Rosetown, Sask.

Those desiring to have letters published in this column should write the Editor Techni-Talk, Electronic Components Division, General Electric Company, Owensboro, Kentucky. For each such letter selected for publication you will receive $10.00 worth of General Electric tubes. In the event of duplicate or similar items, selection will be made by the Editor and his decision will be final. The Company shall have the unlimited right without obligation to publish or otherwise use any idea or suggestion sent to this column.

Caution: The ideas and suggestions expressed in this column are those of the individual writers. These ideas and suggestions have not been tried by the General Electric Company and therefore are not endorsed, sponsored or recommended.

G-E WIRELESS REMOTE CONTROL SYSTEM IV

(Continued from Page 1)

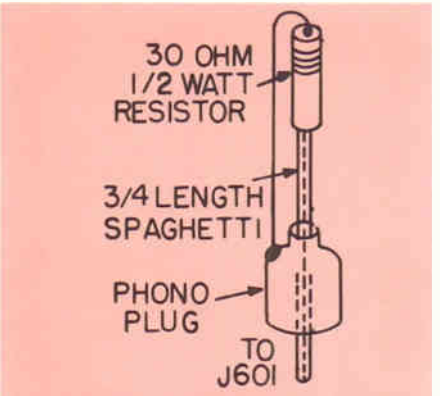


Fig. 3 Dummy Antenna

3. Connect the power plug to an indicating device (See Fig. 1 in Vol. 12, No. 3 issue) since reed adjustments should be made only with the TV receiver inoperative.

4. Connect a .001 capacitor across C656 of the transmitter. (Refer to Fig. 2 in Vol. 12, No. 1.)

5. Depress the transmitter function button corresponding to the offending reed. To hold the transmitter "on" during reed adjustment, insert a coin (penny) between the function button and the case.

6. Bring the transmitter close to the dummy antenna so as to produce 10 volts P. O. (3.5 volts RMS) on the VTVM or scope. Position the transmitter to maintain this voltage.

7. Turn the reed contact point adjusting screw slightly (counterclockwise) until the reed just de-activates its respective control circuit. (Usually this is less than a quarter turn.) Activation of volume functions is indicated by movement of the associated sensitive relay.

In like manner, each of the reeds may be checked for minimum operating voltage by repeating Steps 1 through 7, alternately depressing each of the transmitter function buttons.

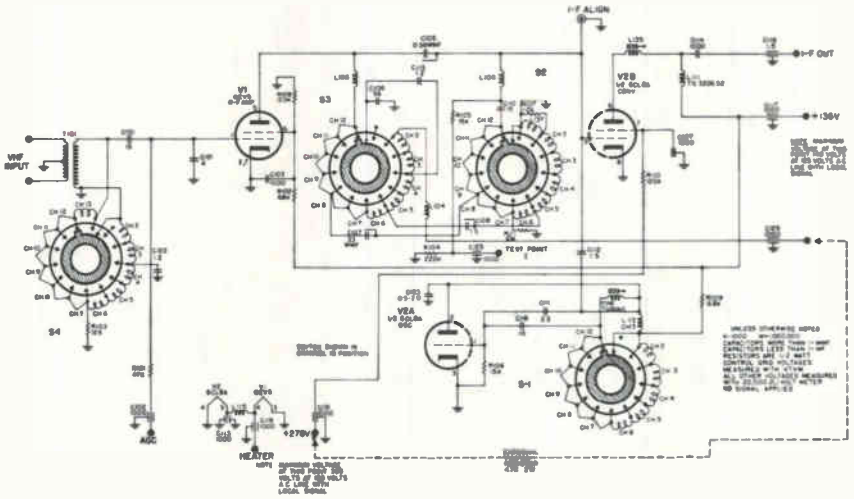
To check maximum operating voltage of the reeds, move the transmitter close to the dummy antenna so as to produce 25 volts P. O. (8.8 volts RMS). As each of the buttons is depressed, the corresponding function must indicate positive operation. Failure of any reed to initiate positive function operation indicates improper adjustment in steps 6 and 7.

Have trouble holding record changers and TV or radio chassis in servicing position? The new G.E. Chassis Jack can help you. Ask your distributor for ETR-1470 or use order coupon on page 9.

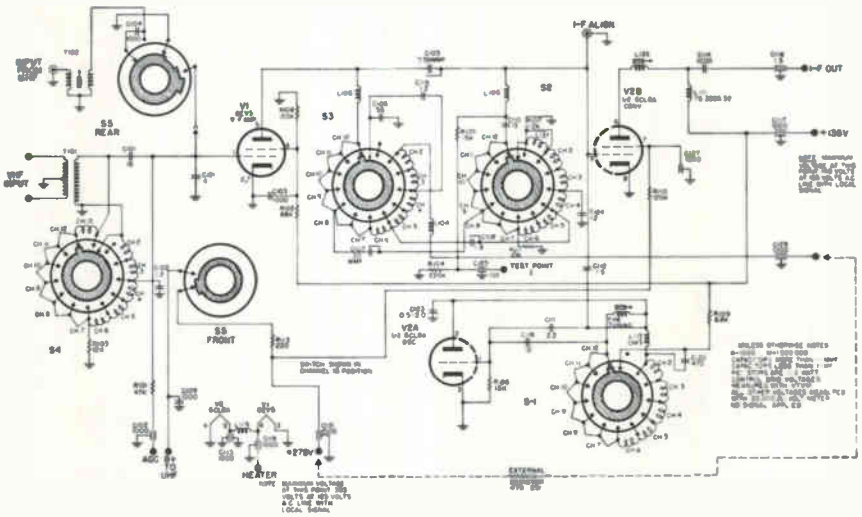
Tele-Clues

"M6" SCHEMATIC

Schematic diagram for "M6" line of General Electric receivers. These receivers use 17, 19, 21, and 23 inch electrostatic aluminized picture tubes.

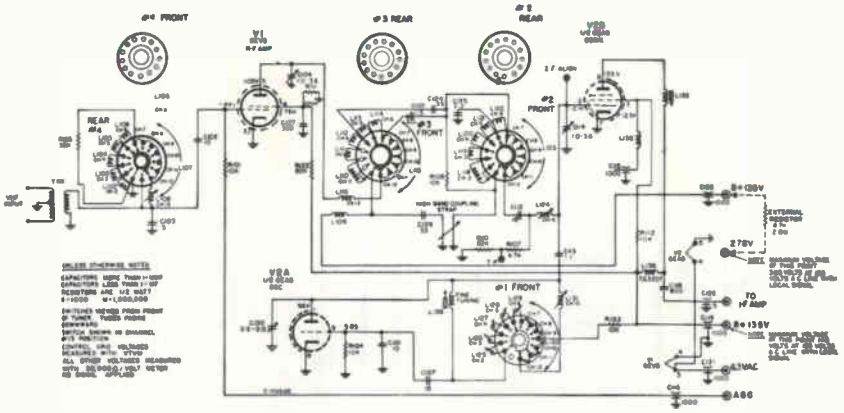


SCHEMATIC DIAGRAM WT86X96 VHF TUNER



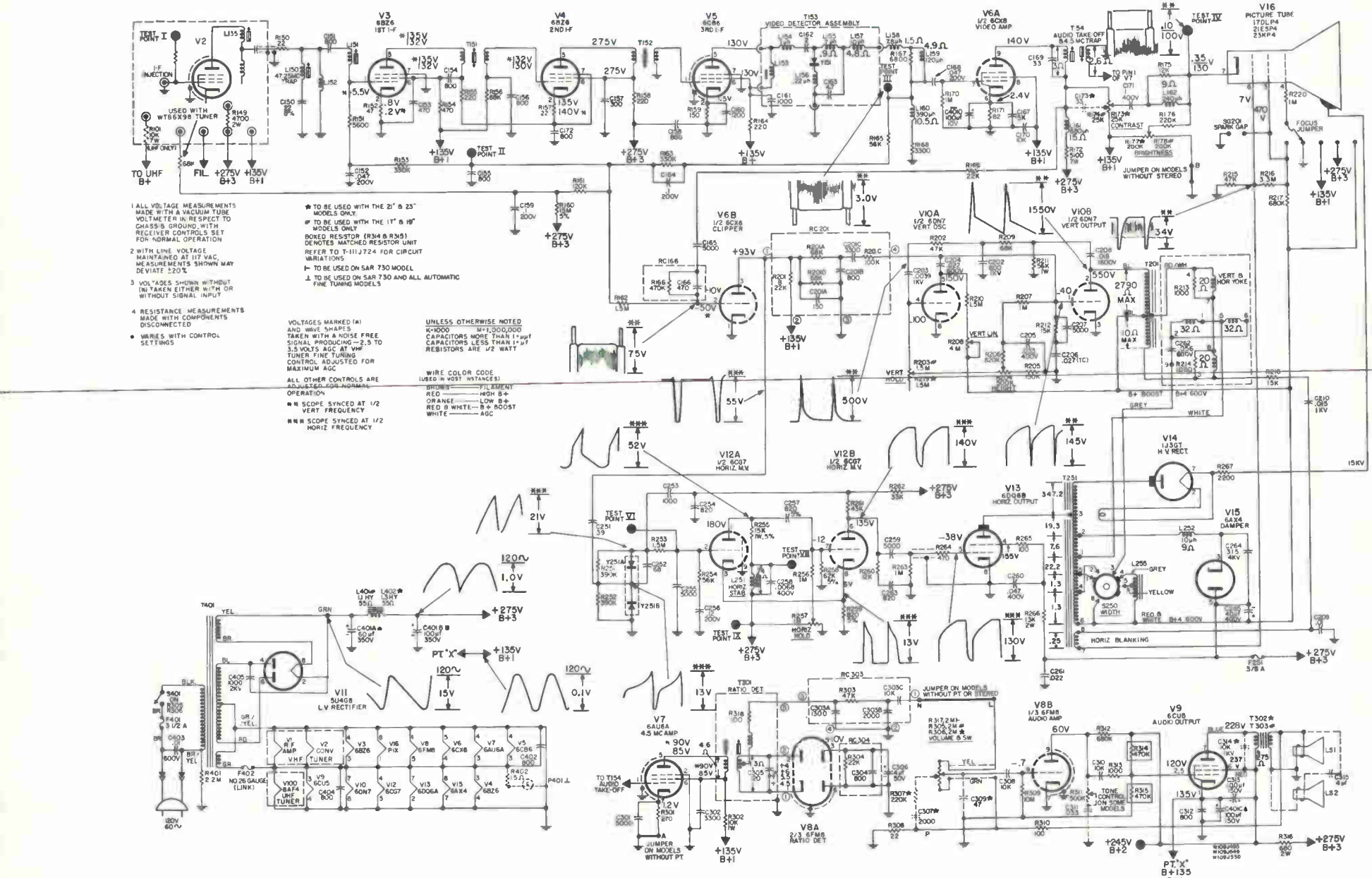
SCHEMATIC DIAGRAM WT86X97 VHF TUNER

Complete Tele-Clues Binders containing an index, 284 Tele-Clues and all Tele-Clue Schematics can be obtained from your General Electric tube distributor or from our Chicago Warehouse. Use coupon on page 9 for warehouse order.



SCHEMATIC DIAGRAM WT86X98 VHF TUNER

"M6" SCHEMATIC WITH VOLTAGES AND WAVESHAPES



SERVICE NOTES

TELEVISION

Special Components In Television Receivers

An examination of the so-called "special" capacitors listed in television service manuals today is apt to prove very confusing to the average service technician. This is understandable, unless he has taken the trouble to investigate the significance of the various designations which are used. The natural outcome of this condition results in the use of some capacitor close to the specified value, which happens to be handy and is assumed to be "just as good." This practice frequently leads to the addition of a new fault in the receiver although it may have corrected the original problem.

When a manufacturer specifies a particular type or characteristic for a capacitor, he has excellent reasons for doing so. As a service technician, if you replace one of these components with an improper unit, you are in some manner degrading the performance capabilities of the receiver and, at the same time, you are not doing the proper job for your customer. A few of the problems which may be introduced by this practice are:

1. Regeneration or oscillation in in I-F or R-F circuits.
2. Loss of sensitivity at certain frequencies.
3. Frequency drift in critical circuits.
4. Changes in some performance factors with changes in operating temperatures.

There are several designations which may be applied to "special" capacitors, and which may require some clarification. The most commonly used designations and their meanings are listed below.

DESIGNATION	TYPE	CAPACITY CHANGE WITH INCREASED TEMP.
HiK	Tubular Disc Feed Thru	Up to 50% change
Semi-HiK	Tubular Disc	Up to 35% change
Semi-Stab. HiK	Tubular Disc	Up to 15% change
Stab. HiK	Spec. Tubular	Up to 7½% change
NPO	Spec. Tubular	Zero change
N750	Spec. Tubular	Negative temperature co-efficient of 750 parts per million, per degree increase
P100	Spec. Tubular	Positive temperature co-efficient of 100 parts per million, per degree increase
P100-N750	Spec. Tubular	Range from positive 100 to negative 750 parts per million, per degree increase

If you would like to receive additional information on some specific G-E Electronic Component, just clip out this coupon, write in the material desired, and send it to the Editor. Information, if available, will be sent to you by return mail.

_____

_____

Please check your name and address on the reverse side. Make any necessary corrections below.

(Please Print)

Name.....

Street Address.....

City, Zone No. and State.....

If you expect to move within next two months, please print new address above. If you are receiving duplicate copies, please check this box ☐ and indicate mailing list number which appears at lower left corner of the address area on each copy you receive.

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General Electric Company
Department "A"
3800 N. Milwaukee Ave.
Chicago 41, Illinois

Enclosed is money order or check payable to General Electric Company for:

.....ETR-1593 Magnetic Swing-Beam Service Light..... $1.90

.....ETR-1095 Complete Tele-Clue Binder..... $3.25

.....ETR-1470 Chassis Jack $1.25

Total Amount of Check or Money Order .....

PRINT YOUR COMPLETE ADDRESS ON OTHER SIDE

RADIO

P710A/P711A
Circuit revisions to improve over-all performance

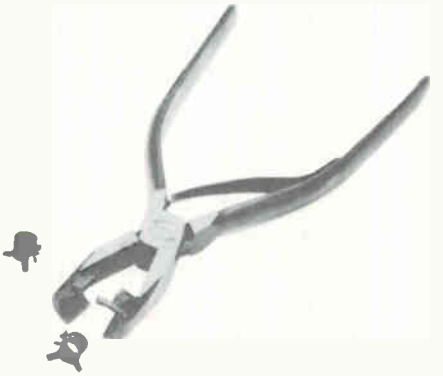
The performance of the P710A/-P711A transistor radios, especially in regard to power output, can be greatly improved by making three basic changes in the detector and power supply circuit. The following procedure applies only to the "A" version of the P710 series; later production versions incorporated these changes.

It is recommended that the following five steps be made on all customer P710A/P711A receivers brought to your attention because of poor response of the receiver:

1. Replace C8 (8200mmf.) with a 3000mmf. capacitor.
2. Replace R8 (47K) with a 22K or parallel R8 with another 47K.
3. Replace R12 (680 ohms) with a 390 ohm resistor or parallel R12 with another 680 ohm resistor.
4. Check X3 (2N169) on your transistor tester. Deflection must be more than half scale (on Sencore tester). If not, replace X3 with a 2N169 that does measure in the upper half of the scale.

Special Clip Pliers For Radio Repair

A special tool (see photo) has been designed to eliminate one of the most frustrating problems that has ever plagued a radio technician: The removal and installation of the round metal self-locking clips used to attach speakers and clocks to plastic cabinets. Heretofore, there were no tools available that would do a good job; consequently, the radio technician was obliged to cut, squeeze and wrestle with



the clip for some time before he either removed it or broke the cabinet. The new tool enables the round clips to be removed and added easily, with a considerable savings in time, temper, and cabinets.

These pliers are available from authorized General Electric Radio/Phono Service Stations. For the address, consult the classified pages of your telephone directory. If you have any difficulty obtaining this item notify the G-E TECHNI-TALK office. The price is $5.00 each.

ORIGINAL G-E SERVICE AIDS

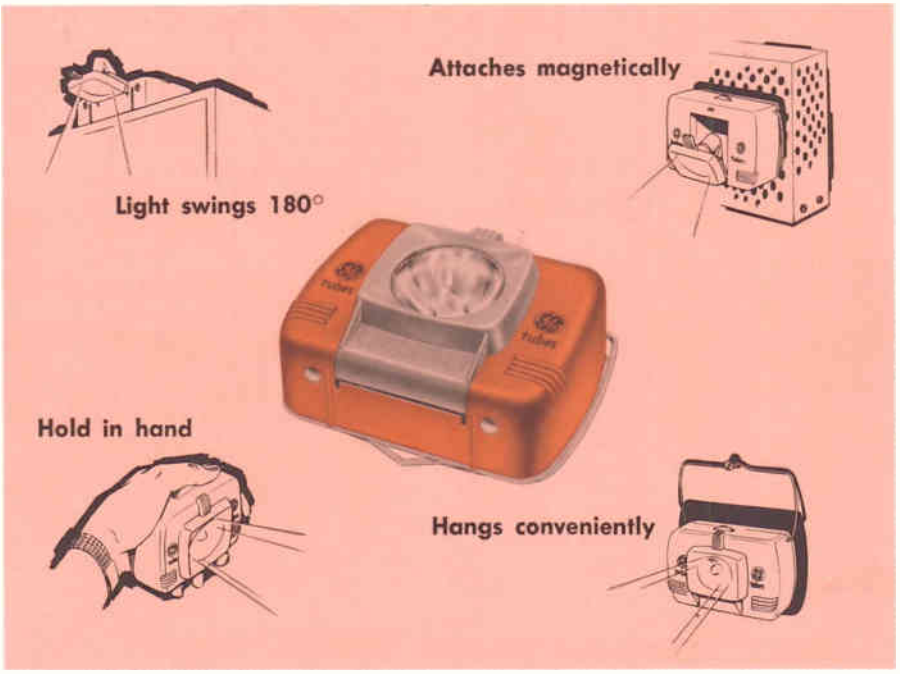
MAGNETIC SWING-BEAM SERVICE LIGHT ETR-1593

In the last issue we announced the availability of the G-E Fuse and Heater Checker, ETR-981-A from our Chicago Warehouse. In this issue another G-E Service Aid, the Magnetic Swing-Beam Service Light ETR-1593, will be made available in the same way.

Here is a new kind of service light that will save time and make your everyday service work easier. With this unit it is possible to illuminate even the most hidden area of a radio or TV chassis.

It is completely flexible. It has a swing-out hanger bar on the back with a V-bend to hold it in position on a screw, nail or any other projection. The magnet built into the back is strong enough to hold it in any position when placed against a metal chassis or cabinet. Probably the most important feature is the "Swing-Beam" which allows the light and reflector to swing in a full 180° arc. It can also be laid flat on any surface and the "Swing-Beam" positioned to light the desired area. Several different ways in which this unit can be used are shown in the drawings at the right.

The G-E "Swing-Beam" Service Light is an entirely different type of flash light. This light, has been designed to *hold its position* whereas most other lights were designed to be *held in position.*



This service light is small enough to fit in your pocket and will take up very little room in your service case. It uses two "C" batteries and a General Electric PR-4 bulb. Both are standard items.

The ETR-1593 Magnetic Swing-Beam Service Light can be obtained from your G-E tube distributor or from our Chicago Warehouse. Use coupon at bottom of page 9 for warehouse order.

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