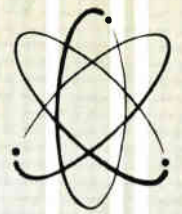




# Techni-talk

COMPLETE ELECTRONIC SERVICING INFORMATION  
radio • tv • hi-fi



Vol. 18, No. 1

Spring, 1966

## G-E Porta-Color Television Picture Tube

The 11SP22 color picture tube is a three gun aperture mask type picture tube. This tube has three groups of colored phosphor dots — Red, Green and Blue — that are activated or illuminated by the three separate electron beams. The beams are deflected simultaneously by a deflection yoke with provision for control of the beams so that each beam will strike only the desired group of color dots. With each of the beams properly registered on a respective group of dots, the result is three separate rasters. These rasters are then superimposed, one on top of the other, producing a single raster such that with the proper d-c bias and a-c signal conditions applied to the guns of the picture tube, a black and white or color picture can be produced. The 11SP22 picture tube has three electron guns in-line on a horizontal plane as shown in Fig. 1. The phosphor dot

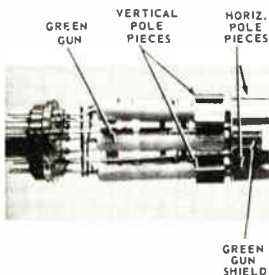


Fig. 1 Electron Gun Structure

pattern on the screen of the picture tube is arranged in the same general fashion as other tri-gun tubes and the guns of this tube scan the horizontal in-line rows of phosphor dots rather than scanning the triad groups. This deflection arrangement, along with over-all system considerations, that includes a precision wound toroidal deflection yoke, lead to a simplified set-up or convergence procedure. The tube is constructed with an "F" (fibre) wrap rim band epoxy cemented to the periphery of the tube where the face plate joins the funnel. The deflection angle is 70 degrees.

### Color Selection or "Purity"

The red, green, and blue light emitting dots which are 19 mils. in diameter are arranged in a horizontal line with the dot of each successive line staggered with respect to the previous line as shown in Figure 2.

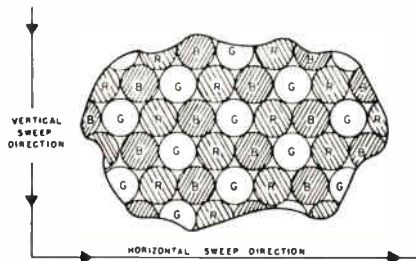


Fig. 2 Phosphor Dot Structure

Located behind the dot pattern is a metal aperture mask which contains one-third the number of 12 mil. diameter holes as there are phosphor dots on the screen. The mask is positioned and shaped so that the holes line up behind the green phosphor dot as shown in Figure 3. Distance

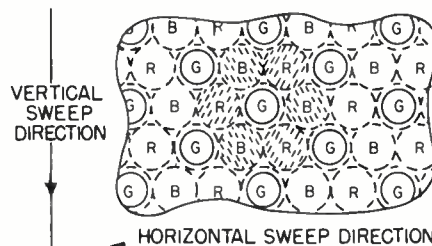


Fig. 3 Aperture Mask Position

of beam travel from the aperture hole to the phosphor dots allows approximately 14 mils. of dot bombardment by the electron beam. The approximate attitude of the three electron beams with respect to the phosphor dots and aperture mask is shown in Figure 4. The beams originate in the electron gun assembly within the neck of the tube and, as previously mentioned, the three guns

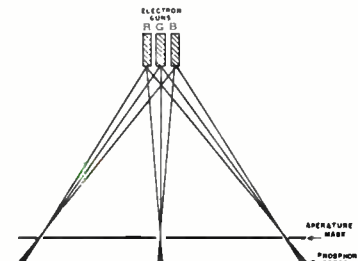


Fig. 4 Beam Landing

are in-line on a horizontal plane. Each of the three electron guns is similar to a monochrome electrostatic focus picture tube gun. Although the aperture mask holes are behind the green dots, the beams of the red and blue guns do not strike the green dot (when the receiver is properly purified) because of the approach angle of the beams. The beam angle and the distance of the aperture mask from the tube screen is such that the beams strike only the proper phosphor dot.

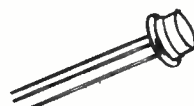
Purity is accomplished in the following manner: After a "rough-in" convergence, turn the blue and green guns off and slide the yoke back. Turn the purity rings so as to place the red circular pattern in the center of the picture tube screen. The yoke is then pushed forward to produce a pure red field. Each of the two remaining colors is then viewed and when each beam strikes only the correct color phosphor at any point on the screen, perfect color phosphor at any point on the screen, perfect color purity is attained.

*Continued in next issue*

### "STOP & GO"

General Electric's big new spring promotional program is now in full swing! There's a host of valuable prizes, including a Ford Mustang Hard-top awaiting you TV Dealer/Servicemen on the big G-E "STOP & GO Sweepstakes." Your Sweepstakes numbers are printed in the March and April issues of Electronic Technician magazine. Winning numbers are posted in the stores of all participating General Electric tube distributors.\* You'll also find that your General Electric tube distributor has big news for you about the G-E "GO" tube promotion by which you can earn gasoline product premiums with your purchases of General Electric receiving tubes. Details of this program are in the four-page center insert of this issue of Techni-Talk.

\*Sweepstakes participation and premiums available at the option of your local G-E Distributor.





## BENCH NOTES

### OHMMETER POLARITY

It is important for a serviceman to know the absolute polarity of his ohmmeter jacks when he uses it in transistor servicing. Some ohmmeters utilize circuits which have other than normal battery polarity. With this type of ohmmeter, the red jack would have a negative polarity and the black jack a positive one. The correct polarity of an ohmmeter can be determined by connecting a volt meter across the ohmmeter jacks and observing the needle swing on the voltmeter. This will determine the polarity of the ohmmeter battery, a precaution necessary when measuring resistance in the leg of a circuit where an electrolytic is present. If the wrong polarity is used, an incorrect reading would result because the electrolytic would be connected backwards.

*Frank Damico  
86-75 Midland Pky.  
Jamaica, N. Y. 11423*

### EXTRA THIN TEST LEAD

Many test instruments come equipped with test leads terminated with alligator clips. It is often necessary to make connections in areas where an alligator clip is too cumbersome and an insulated probe is required. I have found that a simple adaptor solves this problem.



This adaptor is a 5" or 6" length of #12 or #14 plastic insulated solid copper wire with an end bared approx.  $\frac{3}{4}$ " and the other end about  $\frac{1}{4}$ ".

By inserting the  $\frac{3}{4}$ " end into the alligator clip you have a slender well insulated probe that permits switching from probe to clip with a minimum of bother.

*Harold T. Georgeson  
2452 Farnsworth Lane  
Northbrook, Illinois 60062*

### WEAK RF STAGE

When you come across a TV with a weak RF stage and you don't want to pull the tuner, try the following suggestion. Take the tube shield off the RF tube and insulate the base with a piece of tape so it won't short out to the tube socket. Next solder a three foot length of insulated hookup wire to the shield. Replace the shield and form the wire into a loop in the back of the set, positioning it for the best picture. In some cases, connecting an additional wire from the tube shield to one of the antenna terminals will further improve the picture. This method will often restore or significantly improve the picture and will eliminate the tedious job of pulling the tuner.

*Richard E. Beatie  
REB Electronics  
1904 E. 114 Ave.  
2 Tampa, Fla. 33612*

### PANEL PROTECTION

A slip of the drill may mar the finished surface of an instrument panel. Whenever I drill a panel to install a switch or other components, I use a patch of adhesive tape at the drill site. I centerpunch in the tape, then drill. Even if the drill should skip out or away, the surrounding finish won't be damaged.

*H. Josephs  
P. O. Box 22  
Gardenville, Penn.*

### UNUSUAL RADIO HUM

We had a small table model radio that had a peculiar 60 cycle hum. At first this sounded like filters and a new filter was bridged across it, but the hum was still there. The customer said that he had checked the radio tubes but we checked them again and only one tube was a little weak.

The hum seemed at first, in the audio stages. This didn't ring true, for on a closer check the hum seemed to exist in the IF or RF stages. Accidentally the variable tuning condenser got pushed and the hum stopped. On a closer look the trouble was easily found. The pilot light assembly was touching the variable condenser's dial string feeding 60 cycles into the mixer stage. Undoubtedly, the customer had created this trouble himself when he took out the chassis to check the tubes.

*Homer L. Davidson  
2821 5th Ave. So.  
Ft. Dodge, Iowa*

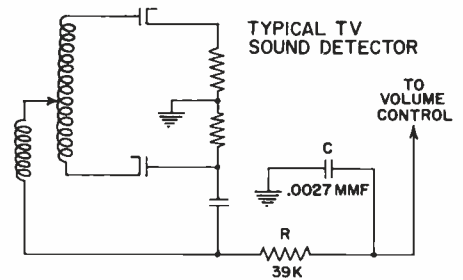


### PORTABLE STOCKROOM

Installation and maintenance of in-plant radio equipment and of 2-way radio in vehicles parked outside the shop is speeded with these shop-built stockrooms on wheels. They carry an in-depth variety of components, the tech's tool kits and a vise atop the handy workbench and will roll to the job site.

Should the wheeled rigs have to be parked for a while, they lock up so their contents are safe from unauthorized personnel. If needed in some distant plant area, they're easily forklifted for transport.

*Harry J. Miller  
Advanced Television-Radio  
991 Forty-Second St.  
Sarasota, Fla.*



### IMPROVING TV SOUND

In most TV sets, the treble response is purposely reduced in order to make the bass sounds more noticeable, and the sound between local and network programs more uniform. This, however, tends to muffle the sound and makes it harder to understand.

The simple treble de-emphasis network feeding from the discriminator or ratio detector in most sets is made larger than necessary. This reduces the treble more than it was boosted at the station and tends to muffle the sound. By reducing the value of the capacitor (C) in the R-C network to about half of its original value or so, the highs come back and intelligibility improves.

*Bob Brettell  
17600 N. E. Seventh Ct.  
N. Miami Beach, Fla. 33162*

### CAUTION

In the Vol. 17 No. 3 and 4 issue there appeared on page 2 a Bench Note with the Title "Convergence Aid". This suggested the use of a piece of masking tape to form a small square in the center of the screen to facilitate making convergence adjustments. The following information has been supplied by our Television Receiver Product Service Section:

In all General Electric CB models using a bonded face-plate picture tube care must be taken not to mark or damage the etched surface.

No tags, banners, or labels are to be stuck to the face-plate with tape, glue, or other means. Any adhesive may cause permanent damage to the face-plate through retention in the microscopic depressions of the etched surface. This will cause light refractions and will be noticed principally on color programs.

Receivers employing a bonded face-plate tube are easily identified by the absence of a separate safety glass.

### NOTE:

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.



**STOP  
&  
GO**

# Sweepstakes and Go Premiums

**Win one of these 141 prizes:**

<b>1</b> FORD MUSTANG HARDTOP	<b>10</b> G-E TUBE CADDIES WITH 160 TUBES
<b>25</b> G-E PORTACOLOR TV SETS	<b>25</b> G-E AM/FM RADIOS
<b>30</b> G-E SLICING KNIVES	<b>50</b> G-E VIDEO CLOCKS

*Look for your Sweepstakes  
number each time you make a purchase.*

**EARN FREE PETROLEUM PRODUCTS WITH YOUR G-E TUBE PURCHASES.**



# STOP

## You may already be a winner in G. E.'s Stop and Go Sweepstakes

Here's Your Sweepstakes Number

Open to Radio, TV and HiFi Service Dealers only. If you're a winner, fill in the information below and send this coupon by registered mail to: G-E Sweepstakes, Suite 107 - 2100 Gardner Lane, Louisville, Kentucky 40205.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Distributor's Name \_\_\_\_\_



### FIRST PRIZE - 1966 Ford Mustang Hardtop

#### 10 SECOND PRIZES

Tube Caddies with 160 G-E Tubes



#### 25 THIRD PRIZES

PortaColor TV Sets



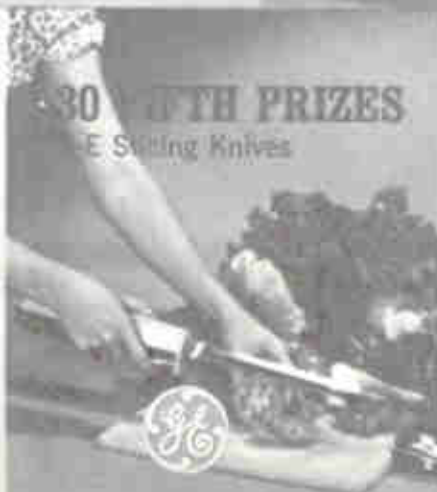
#### 25 FOURTH PRIZES

G-E AM/FM Stereo Radios



#### 30 FIFTH PRIZES

G-E Slicing Knives



#### 50 SIXTH PRIZES

G-E VideoClocks



# GO

with free Shell or Sunoco products available with G-E Tube purchases

Check today to see if you're a Sweepstakes winner at your G-E Distributor. Match your number against the list of winners. There's a good chance one of these 141 prizes may be yours. As a bonus you will find a different number in both the March and April issues of **ELECTRONIC TECHNICIAN**.

On top of this you will be able to earn quality Shell or Sunoco products with all your regular purchases of General Electric Entertainment Receiving Tubes. Depending on your location, either Shell or Sunoco product certificates will be provided.\* There's no limit on the number you can earn, so start collecting your premium points now.

Your G-E Distributor\*\* is the man to contact for details on both the Stop and Go Sweepstakes and Go Premiums. Stop in and see him today.

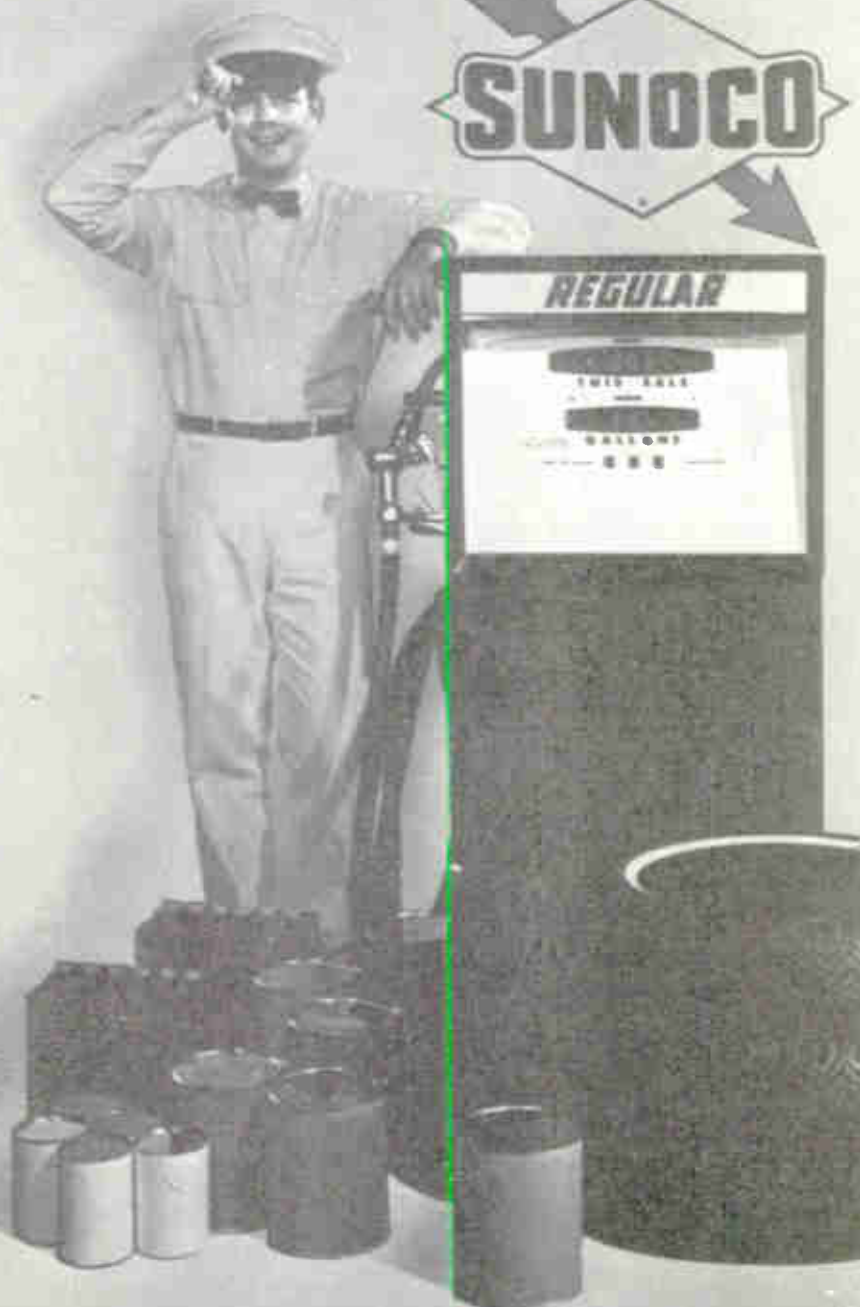
Distributor Sales, Owensboro, Kentucky

\*Gasoline and petroleum product certificates will be redeemable at Conoco stations in North Dakota, South Dakota, Montana, Oklahoma, Kansas, Nebraska, Arkansas, Wyoming, Colorado and Utah.

\*\*Premiums and Sweepstakes participation available at the option of your local G-E Distributor.

## OFFICIAL SWEEPSTAKES RULES

1. No purchases are required. If your number (provided in this ad) matches one of the winning numbers posted at your participating G-E Distributor, you're a winner.
2. If you are a winner, send your Sweepstakes coupon along with your name and address and the name of your G-E Distributor by registered mail to: G-E Sweepstakes, Suite 102 - 2100 Gardiner Lane, Louisville, Kentucky.
3. Sweepstakes are open to Radio, TV and HiFi Service Dealers only. An individual may win only once. Employees of General Electric or its Distributors are not eligible.
4. Sweepstakes closes May 30. All winning claims must be postmarked by that date and received by June 9. All decisions concerning winners will be made by General Electric Company and such decisions are final.
5. This Sweepstakes is void in Nebraska, Florida or wherever prohibited by law, and is subject to all Federal, State and local laws and regulations.





**LOOK**

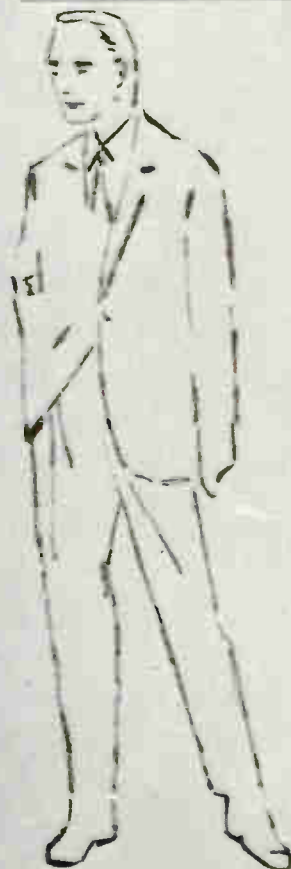
**for the G-E Distributor displaying these signs**

**STOP & GO**

**STOP** You may already be a winner in G-E Stop and Go Sweepstakes

**STOP** To see if you're among the 141 winners in G-E's Sweepstakes

**GO** with the Shell or Sunoco premiums available with G-E Tube purchases



**GO** with the Shell or Sunoco Premiums available with G-E Tube purchases

Start Collecting these Valuable Premiums Today with TUBES

**START NOW!**

EARN FREE SHELL OR SUNOCO PRODUCTS WITH YOUR G-E TUBE PURCHASES

The signs and displays at your participating G-E Distributor will help determine if you're a Sweepstakes winner. They will also serve as a reminder to you of the big Shell and Sunoco deals General Electric is offering. Stop in today to see if you're a winner and start collecting premium points with your G-E tube purchases.

**PLAN A \$5.50 . . .**



**PLAN B \$11.50 . . .**



These plans provide you with complete service information on GE Radios, Show'n Tell, Portable Phonos, Portable Tape Recorders, Intercoms and Citizen's Band Radios.

Subscription runs from January-December 1966. You will receive every 1966 manual, regardless of when you subscribe during 1966. Plan B will include all 1965 manuals not included in the 1963-1965 Radio Service Guide.

**PLAN A includes**

**1. SERVICE MANUALS**

Keep completely current with service information on the latest radios, portable phonos, portable tape recorders, intercoms, show'n tell, and citizen's band radios as they go into production. Each manual contains all necessary servicing data, such as schematics, wiring diagrams, alignment procedures, electrical specifications and parts lists with prices.

**2. REPLACEMENT PARTS CATALOG**

You receive up-to-date parts listings and prices of all radio, portable phono, portable tape recorder, show'n tell, intercom and citizen band radio replacement parts. You will also receive all appropriate interchangeability information on out-of-stock parts.

**PLAN B includes**

**1. PLAN A**

**2. THREE RADIO SERVICE GUIDES**

In three volumes, you will have at your fingertips, a wealth of information covering all GE radios manufactured from 1946 to 1965. In addition to fully-detailed schematics, each guide includes part lists and a special picture-guide section to assist you in making positive set-identification when the model number is unknown.

Use Order Coupon Below

**ORDER COUPON**

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

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

Quantity	Price
..... Plan A for 1966, ETR-3845.....	\$ 5.50.....
..... Plan B for 1966, ETR-3846.....	\$11.50.....
..... Radio Service Guide 1946-1961, ETR-2975.....	1.95.....
..... Radio Service Guide 1961-1963, ETR-3733.....	1.45.....
..... Radio Service Guide 1963-1965, ETR-4406.....	2.95.....
..... TV Service Guide "W" Line Manual, ETR-3906.....	3.00.....
..... TV Service Guide "X" Line Manual, ETR-3907.....	4.50.....
..... TV Service Guide "Y" Line Manual, ETR-4411.....	4.50.....
..... Tube Order and Inventory Guide, ETR-2162.....	.25.....
..... Luggage Type Service Case, ETR-4395.....	13.95.....

(Include applicable state and local tax) \$..... TOTAL \$.....

NAME.....

STREET ADDRESS.....

CITY, STATE and ZIP CODE.....

(Please Print)

**"W", "X" and "Y"**

**LINE SERVICE MANUALS**

To accomplish improved availability and ease of use, Television Service Manuals are now published in consolidated form, shortly after the expiration of the model year (not year of manufacture). Current releases during production years will remain in loose leaf form.

These Consolidated Service Manuals will contain complete Service Information for all chassis built in a given model year. They will be 8½" x 11" in size with full foldout schematics, and in spiral or plastic binding similar to the Service Guides. No more Service Guides will be published since the consolidated manual will serve the same purpose.

ETR-3906 "W" Line Manual (Monochrome only)	\$3.00
ETR-3907 "X" Line Manual (Monochrome & Color)	\$4.50
ETR-4411 "Y" Line Manual (Monochrome & Color)	\$4.50

Available from your distributor — or if he is unable to supply you, use order coupon on page 7.



**ELECTRONICS**

**LEADERSHIP IN ELECTRONICS!**

**LEADERSHIP IN SERVICE AIDS . . . and here are more GE-FIRSTS**

**ETR-4395, New Luggage Type Service Case**



Here is the newest addition to the General Electric Luggage Type line of service cases. This case, ETR-4395, holds over 160 tubes and comes complete with egg-crate separators to hold tubes in position.

Not only does this case have an appearance of quality, but the armored vinyl covering makes it almost impossible to wear out.

Armored vinyl is guaranteed to give extremely good wear. A heavy transparent layer of laminated vinyl protects the calendered luggage brown vinyl. This tough, clear surface resists scrapes, scratches and stains.

All hardware and attachments, corners, hinges, reinforcements, catches, handle posts, etc., are made of heavy nickel plated steel stock guaranteed to

give long wear. A new type of nickel plated "spring up and spring down" snap catch is easy to operate. The solid Bakelite handle is heavier and stronger and is guaranteed against breakage.

The new G-E armored vinyl Service Case ETR-4395 has been designed to look like a fine piece of luggage and at the same time give long wear and satisfactory service. If you want a service case that can really "take it" ask your distributor for ETR-4395 or use the order coupon on page 7. The price is only \$13.95.

Other matching armored vinyl service cases are ETR-3750 which holds over 250 tubes and ETR-3915 which holds 365 tubes plus a separate tool compartment.

**ORDER GUIDE**

25c

**Best**  
for any set!



**SERVICE-DESIGNED RECEIVING TUBES**

FOR FAST DEPENDABLE SERVICE  
*Call:*

Dealer Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Telephone \_\_\_\_\_  
Distributor Selection \_\_\_\_\_  
Total \_\_\_\_\_

**GENERAL ELECTRIC TUBES**

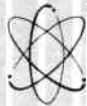
**New Tube Inventory and Order Guide, ETR-2162-C**

This new 24 page book will help you control your inventory, thereby increasing profits and improving your efficiency. Permits you to check turnover of each tube type, keep up to date stock records and list stock orders and shipments received.

Ask your distributor for ETR-2162 or use handy order coupon on page 7. The price is only 25 cents.



**Techni-talk**



Vol. 18, No. 1

Spring, 1966

**In this issue:**

	Page
G-E Porta-Color Television Picture Tube	1
Stop and Go Sweepstakes	1
Bench Notes	2
1966 Radio/Portable Phono	
Subscription Plans	7
TV Service Manuals	7

Techni-talk on AM, FM, TV Servicing, published quarterly by ELECTRONIC COMPONENTS DIVISION, GENERAL ELECTRIC COMPANY, OWENSBORO, KY. In Canada: Canadian General Electric Co., Ltd., 189 Dufferin St., Toronto 3, Ontario. R. G. Kempton, Editor. Copyright 1966 by General Electric Company.



**ELECTRONICS**

NOTE: The disclosure of any information herein conveys no license under any General Electric patent and, in the absence of an express written agreement to the contrary, the General Electric Company assumes no liability for patent infringement (or any other liability) arising out of use of such information by others.

This copy of **Techni-talk** comes to you through the courtesy of your General Electric tube distributor.