

# TECHNICIAN

## & Circuit Digests

1935  
\$80,000,000

1955  
\$1,800,000,000

1975  
\$8,000,000,000

**TV-ELECTRONIC SERVICING**

1128R

114 Park Ave

**TV RECEIVER "SPECS"**

OVER 30 MAKES • 588 MODELS

See Page 40

20 7 WATT RESISTORS

SELECTED POPULAR VALUES



# RESIST-O-CARD

**\$6.20**  
NET

NEW TYPE PW-7 WIRE WOUND POWER RESISTORS • FULL 7 WATT RATING



## TRY

*these modern power resistors*

Servicemen everywhere are finding IRC's unique approach to wire wound power resistors is ideal for today's service requirements. Try them yourself, and benefit by these exclusive IRC features:

- **COMPACT, RECTANGULAR DESIGN** for easier assembly in tight circuits
- **AXIAL LEADS** for easier, faster soldering
- **CLEAR, PERMANENT MARKINGS** for full identification
- **CONSERVATIVE RATINGS** permit continuous operation at full power
- **FAMOUS IRC ELEMENT** sealed in ceramic case for complete insulation and protection
- **2 SIZES**—PW-7, full 7-watt resistors and PW-10, full 10-watt resistors
- **FULL COVERAGE OF RESISTANCE VALUES** for today's service needs

## BUY

*handy Resist-O-Card assortments*

Your IRC Distributor has these new power resistors in 2 convenient assortments of popular values. The values are printed on each card . . . you always know what you have, and you always have what you need.

RESIST-O-CARD #19. 7 Watt assortment of 20 popular values—\$6.20 net

RESIST-O-CARD #20. 10 Watt assortment of 20 popular values—\$6.60 net



### INTERNATIONAL RESISTANCE CO.

Philadelphia, Penna.

FOR 10 WATT POWER RESISTOR REQUIREMENTS SPECIFY IRC ASSORTMENT #20. ASSORTMENT #20 INCLUDES 20 PW-10 RESISTORS IN SELECTED VALUES—\$6.60 NET.

# TECHNICIAN & Circuit Digests

TELEVISION • ELECTRONIC • RADIO • AUDIO • SERVICE

OCTOBER, 1955

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480 Lexington Ave., New York 17, N. Y.  
Telephone PLaza 9-7880

P. H. DEMPERS District Manager  
201 N. Wells St., Chicago 6, Ill.  
Telephone RAndolph 6-9225

CHRIS DUNKLE & ASSOCIATES  
California Representative  
3257 W. 6th Street, Los Angeles 5, Calif.  
Telephone DUnkirk 7-6149  
3077 Turk St., San Francisco 18, Calif.  
Telephone EXbrook 2-0377



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### FRONT COVER

The fabulous growth of TV-electronic servicing during the past 20 years—from \$80,000,000 to \$1,800,000,000 annually—is expected to continue during the next two decades, reaching a record \$8,000,000,000 by 1975. The significance of these statistics is the expanding field of opportunities which will open to qualified TV-electronic technicians. For a preview of electronic installations which will challenge your technical know-how in years to come, see "Your Electronic Future" on page 28.

### FEATURES and ARTICLES

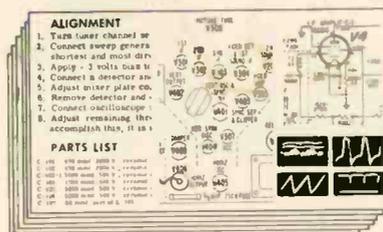
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SPEAKERS



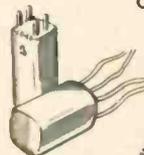
AUTO RADIO AERIALS



VIBRATORS



CONTROLS



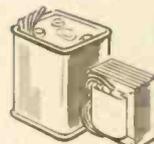
COILS



CAPACITORS



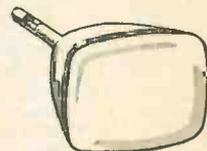
RECEIVING TUBES



TRANSFORMERS



CONDENSERS



PICTURE TUBES

# *There's no business like New Business*

There's nothing quite so healthy for any business as new business, new customers, new sales.

In electronics, your opportunities for new business are greatly increased when you put the names, Delco and General Motors to work for you. Here are names that are known—names that are respected for quality parts, dependable service, business integrity and customer assistance.

But your bid for new business doesn't stop here, for Delco offers you a very unique opportunity. Delco is the sole source for original equipment parts used on more than

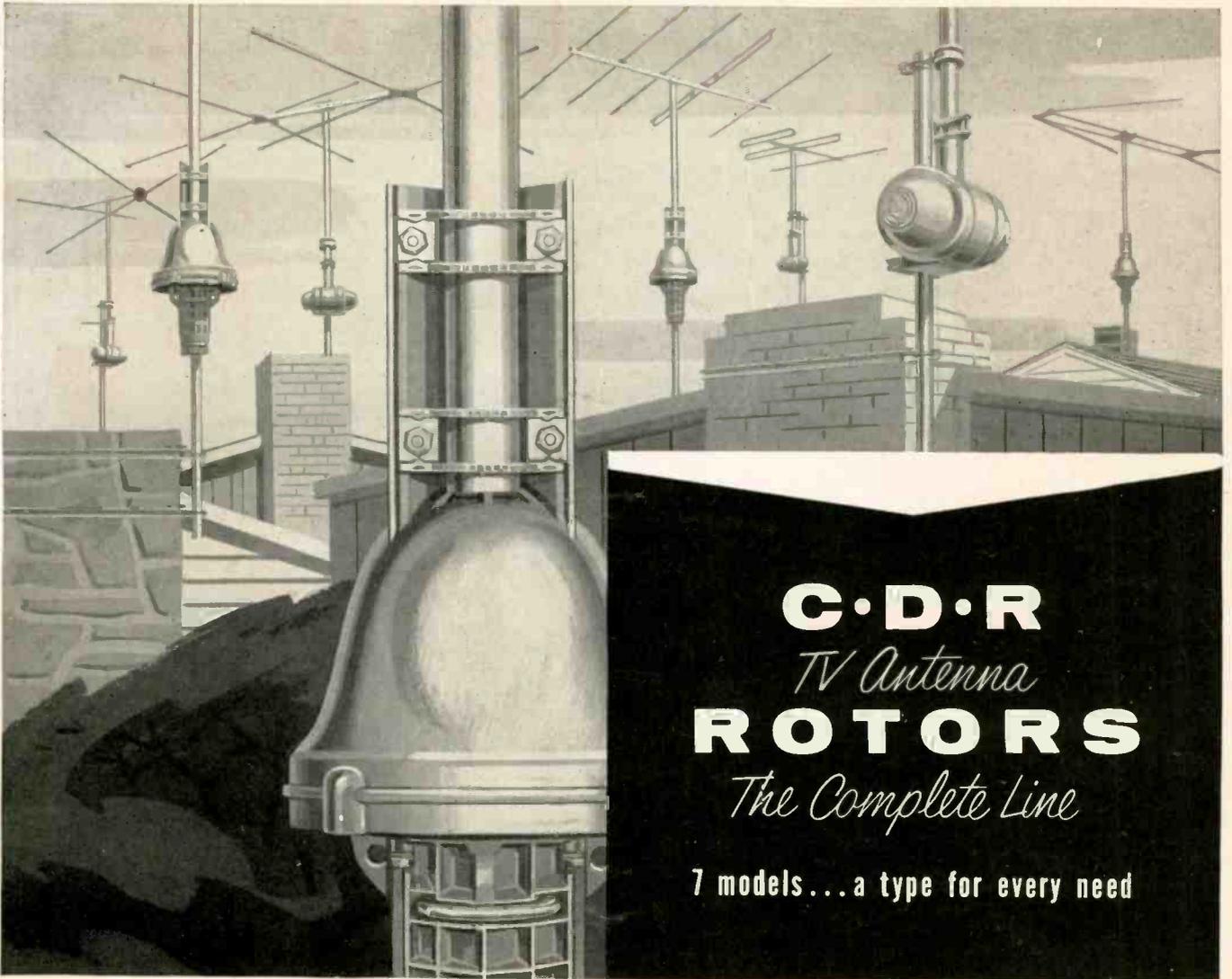
13 million car radios! This vast readymade market for special application parts can mean new replacement business for you. In addition, Delco is an important and reliable source for the most used universal replacement parts for electronic equipment.

There's still more—Delco also issues current bulletins and maintains field schools to keep you posted on the latest developments in the electronics industry. So see your Delco Electronic Parts Distributor soon, he'll explain the many ways that Delco and General Motors can help you get your share of new business.

A GENERAL MOTORS PRODUCT



A UNITED MOTORS LINE



**C·D·R**  
*TV Antenna*  
**ROTORS**  
*The Complete Line*

7 models... a type for every need

featuring **C·D·R automatic ROTORS**

Here they are . . . the fastest selling line of rotors . . . complete in every detail . . . including three models in completely AUTOMATIC rotors! The AR-1 and AR-2 and the AR-22 which is the automatic version of the famous TR-2. ALL FIELD TESTED AND PROVEN BY THOUSANDS OF SATISFIED USERS!

**TR-2** The heavy duty rotor with plastic cabinet featuring "compass control" illuminated perfect pattern dial . . . uses 8 wire cable.

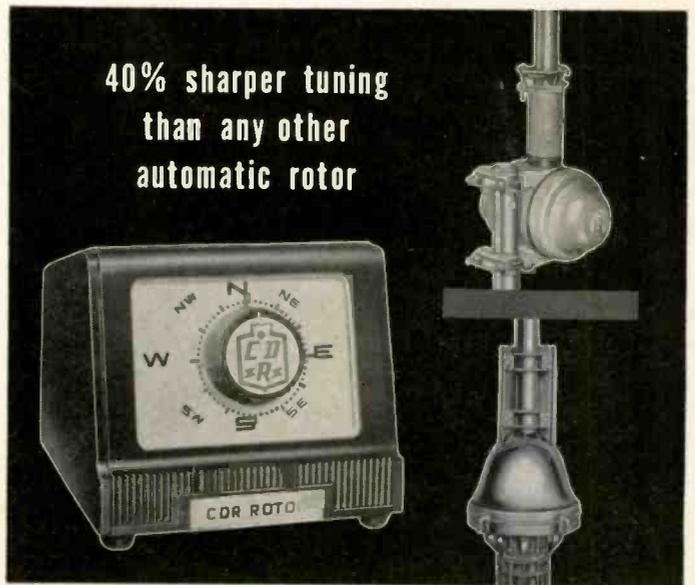
**TR-12** Complete rotor INCLUDING thrust bearing. Handsome modern cabinet with meter control dial, uses 4 wire cable.

**TR-4** The heavy duty rotor complete with handsome new, modern cabinet with METER control dial, uses 4 wire cable.

**TR-11** Same as model TR-12 without thrust bearing.

**pre-sold**

PRE-SOLD to millions with the greatest concentration of TV Spots in our history.



40% sharper tuning than any other automatic rotor



**CORNELL-DUBILIER**  
 SOUTH PLAINFIELD, N. J.

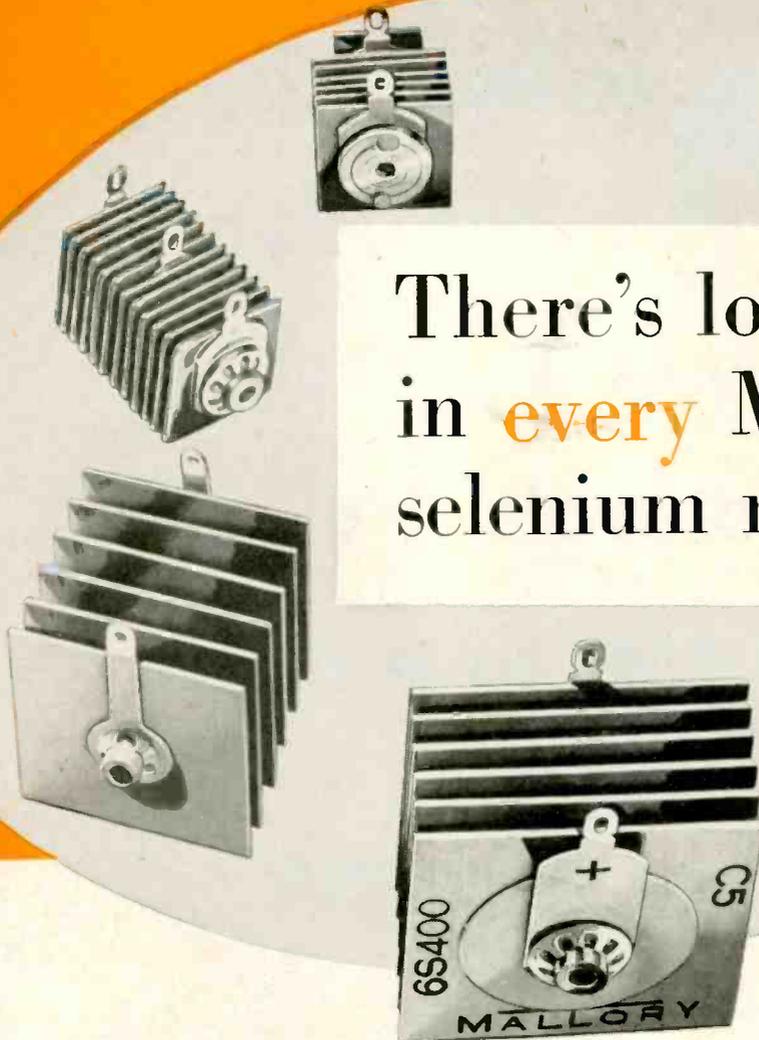


**THE RADIART CORP.**  
 CLEVELAND 13, OHIO

P. R. MALLORY & CO. INC.  
**MALLORY**  
APPROVED PRECISION PRODUCTS

P. R. MALLORY & CO. INC.  
**MALLORY**  
APPROVED PRECISION PRODUCTS

P. R. MALLORY & CO. INC.  
**MALLORY**  
APPROVED PRECISION PRODUCTS



## There's long life in **every** Mallory selenium rectifier

A NEW LINE of Mallory selenium rectifiers now gives you stacks that you can depend on *every* time on replacement jobs. Our engineers have developed designs and manufacturing methods unique in the rectifier business, which produce performance and uniformity never before possible.

Service life of the new rectifiers is exceptionally long. Due to their unusually low forward voltage drop, their efficiency is high—and holds its value without “aging away” in service. And most impor-

tant—you get these extra performance characteristics on *every* stack.

Every time you use a Mallory selenium rectifier on a replacement job, you can be sure that you are equalling or exceeding original equipment specifications. You're sure, too, that the job will be free from costly call-backs.

Your local Mallory distributor carries a complete selection of the new rectifiers in conservatively figured ratings to fit popular TV and radio sets. Order your stock from him today.

**Another service engineered product by...**

P. R. MALLORY & CO. INC.  
**MALLORY**

CAPACITORS • CONTROLS • VIBRATORS • SWITCHES • RESISTORS  
RECTIFIERS • POWER SUPPLIES • FILTERS • MERCURY BATTERIES  
**APPROVED PRECISION PRODUCTS**

**P. R. MALLORY & CO. Inc., INDIANAPOLIS 6, INDIANA**

**Because** you're going to be servicing, selling, and talking **Color TV** more than ever in the months ahead, you'll be glad to know Motorola Color TV, the set that's easiest to service, is also the easiest to sell!

**Easiest to service because** it's easiest to get at. Like all Motorola products, Motorola Color TV has simple, straightforward design with less chance for service problems and more room for service work. (All parts are immediately accessible for testing or on-the-spot servicing.)

**Easiest to sell because** it's the most service-proved and the most reasonably priced. Motorola introduced the first Big Screen Color TV set over a year ago. Since then, Motorola has sold and satisfied more Big Screen Color TV customers than any other manufacturer. There are now three beautiful models to choose from with prices as low as \$695.

**19CT1** This distinctive consolette in beautiful Mahogany contains the finest Color TV chassis ever developed. It provides the finest color and black and white reception, yet costs just \$695.



 **MOTOROLA**

*World's Largest Exclusive Electronics Manufacturer*

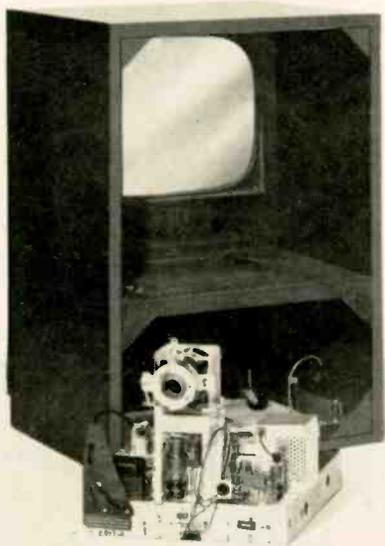
Prices and specifications subject to change without notice.

**She:** *But, how do I know this is a good tube?*

**You:** *Because, this is a CBS aluminized Mirror-Back picture tube. There aren't any better.*

**She:** *And I see it has the Good Housekeeping Guaranty Seal, too. That's proof enough for me.*

Customer confidence really counts when it comes to the big tube. That's when CBS tube advertising helps you most. For CBS tubes have the Good Housekeeping Guaranty Seal and are nationally advertised to 76.9% of your customers . . . the women of America. And 53% of these women are influenced in their purchases by that seal of approval. You protect yourself and gain your customer's good will when you install a new CBS aluminized Mirror-Back picture tube.



Show her the CBS carton with the Good Housekeeping Guaranty Seal.



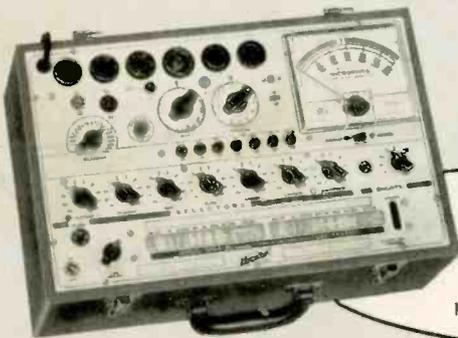
**CBS-HYTRON**, Danvers, Massachusetts . . . A DIVISION OF COLUMBIA BROADCASTING SYSTEM, INC.

# 64% of the top Engineers

## PREFER AND USE

# HICKOK

## DYNAMIC MUTUAL CONDUCTANCE TUBE TESTERS



**MODEL  
600A**

World's most popular  
Tube Tester

"... that 600A is certainly unbeatable! I have sold 4 for you by just letting service centers use mine for part of one day."

Harold F. Tolles, St. Johns, Mich.

"I purchased a 600A last Fall and have found it to be one of the best investments in test equipment that I have ever made."

R. Lytwyn, Nytyl Electronics

All tube testers manufactured today fall into four major classifications.

If you use vacuum tubes in your profession, and if you ever intend to purchase a tube tester please write today for the 28 page book of Tube Tester Facts and learn the advantages of each classification in order that you will be able to more efficiently select for your requirements.

This detailed, illustrated and descriptive book also contains circuit diagrams and formulas.



### THE HICKOK ELECTRICAL INSTRUMENT CO.

10523 DUPONT AVE. • CLEVELAND 8, OHIO  
Gentlemen:

Kindly send me free of charge your new 28 page book of Tube Tester Facts.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

## LETTERS

To the Editors

### Too Much Talk

(The following letter was sent to Howard J. Wolfson, Chairman, Associated Radio & Television Servicemen, Chicago, in support of ARTS' resolution opposing distributor wholesale sales to the public. A copy was sent to TECHNICIAN.)

DEAR SIR:

Your resolution reflects my personal views and gripes of many years' standing. I am strongly, even violently opposed to selling radio-electronic replacements to the public at trade discounts. While manufacturers and distributors are guilty of this breach, I'm afraid the servicemen are also contributing to the evil by failing to insist on proper identification procedure at the distributor store.

For another thing, the serviceman talks too much. He often tells the set owner just what is wrong with the inoperative set, following a time-consuming diagnosis. What's to prevent the buck-conscious set owner from dropping in at any distributor and picking up the needed replacements?

I don't believe the general public purchases a capacitor or resistor or transformer or other replacement requiring time, tools and "know-how" to install, unless the serviceman has talked too much. But when it comes to accessory-like products, such as tubes, then I believe the public buys at wholesale.

I am in full sympathy with the activities of many service organizations in outlawing distributors who fail to protect the service trade.

CHARLES GOLENPAUL  
VICE PRESIDENT

Aerovox Corp.  
New Bedford, Mass.

### Color TV

EDITORS, TECHNICIAN:

Please send me information on where to get a color television set wholesale for display and color service advertising.

JOHN W. ELSLDIN  
Curtis Radio-Television Service  
Revere, Mass.

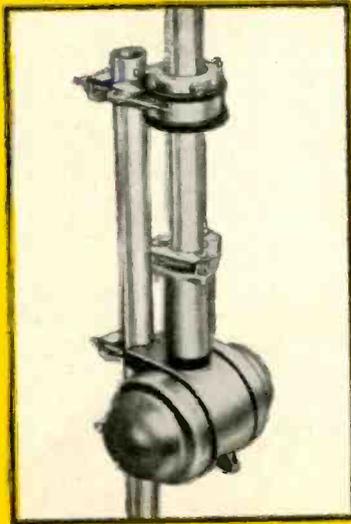
● Arrangements for technicians to obtain color sets have been worked out through Motorola and RCA. Reader Elsdin, and the many other forward looking techs who have written us asking the same question, should contact the local distributors of these two companies. If you do not know who these distributors are, find out by writing to Mr. E. R. Taylor, Vice President, Motorola, Inc., 4545 Augusta Blvd., Chicago

(Continued on page 10)



*Extra Sales... Extra Profits with*

# PHILCO AUTOMATIC ANTENNA ROTOR



## Super Pin-Point Reception

There's sales magic in the Philco name . . . especially when it appears on this top quality, customer-satisfying Automatic Antenna Rotor. Precision-designed for accuracy, ruggedly built for long, trouble-free life . . . the Philco AP-2 Rotor outmodes all other antenna rotating devices.

The Philco AP-2 permits pin-point adjustment with sharp separation . . . turn the knob to the desired position and antenna revolves to the exact location chosen . . . automatically. It locks firmly and *will not drift or stray*. Accuracy is not affected by changes in line voltage.

### **IT SELLS ITSELF!**

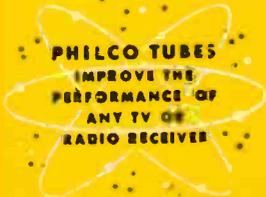
Thousands of satisfied purchasers everywhere have found the Philco AP-2 a perfect answer for better pictures, and Service Dealers have found the Philco AP-2 Automatic Antenna Rotor the perfect answer for new sales volume . . . greater profits.

Order your stock of the AP-2 from your Philco Distributor now.

Don't forget—every AP-2 you sell means more Philco Share and Profit stamps—Free—More new merchandise to sell at a clear 100% profit. Ask your distributor about the 1955 Share and Profit program at once. *There's money in it for you.*

**PHILCO CORPORATION Accessory Division**

Philadelphia 34, Pa.





# Big bargain for two bits!

Handy, 4 drawer steel stock cabinet

— complete with generous supply of blank labels.



**\$2.50** value

yours for only

**25¢**

plus **40** identification

labels from envelopes containing

**Centralab Ceramic Capacitors**

Gives you a place to keep loose capacitors after you've opened an envelope

To get this handy cabinet, you buy capacitors just as you usually do to meet your needs — making sure to get Centralab Ceramic Capacitors.

Every envelope of five Centralab Ceramic Capacitors contains a small folder. At each end of this folder, there's a green identification label. One of these labels has this same identification printed on its reverse side, only in black. This is the label you tear off and save.

After you have 40 of these identification labels, send them with a quarter (for postage and handling) — and your name and address (printed clearly) — to Centralab, A Division of Globe-Union Inc., 902J E. Keefe Avenue, Milwaukee 1, Wisconsin.

Save **40** labels like this

green on one side, black on the other



**Centralab** A DIVISION OF GLOBE-UNION INC.

## Letters to the Editors

(Continued from page 8)

51, Ill.; and Mr. R. W. Saxon, General Sales Manager, TV Div., RCA Victor Div., Camden, N.J.—Ed.

EDITORS, TECHNICIAN:

I don't see how one of your correspondents (August "Letters to the Editor") could manage to spend \$4000 on color, unless he bought station type equipment. We bought an RCA CT100, a Jackson 712 color bar dot generator, rebuilt an old scope to make it wideband, and made up a complete set of extension cords. We feel that we are fully equipped to study color TV servicing with less than \$1000 invested. Incidentally, in rebuilding an old scope to make it wideband, I learned more about scopes and wideband amplifiers than I ever would have otherwise.

HOWARD RABE

Rabe Electric Shop  
Fremont, Nebraska

### Color TV

EDITORS, TECHNICIAN:

I read your article (Get Started in Color TV Now). I agree that we need a set to be able to get anything out of reading literature on Color TV. Nobody has a color set in my area but I would like to have one in the service shop.

JOHN KOLANDER  
RADIO TV SERVICE

Juda, Wisconsin

EDITORS, TECHNICIAN:

We shall be very happy to cooperate with any segment of the trade that will help further the color sales.

IRVING SARNOFF  
EXECUTIVE VICE-PRES.  
BRUNO-NEW YORK

New York, N.Y.

EDITORS, TECHNICIAN:

Our Director of Sales feels something could be worked out through our distributors. I have therefore turned over to him the whole story as it developed through your efforts with my recommendation that we follow through on it. I hope this results in widespread knowledge about color.

HAROLD J. SCHULMAN  
CBS-COLUMBIA

Long Island City, N.Y.

### That Girl Again

EDITORS, TECHNICIAN:

After reading about the "technician's dumb girl friend," I was wondering whether she thought a "hot coil" was a "torrid toroid"?

BERNARD ALEXANDER

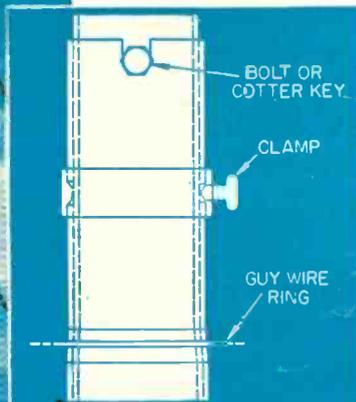
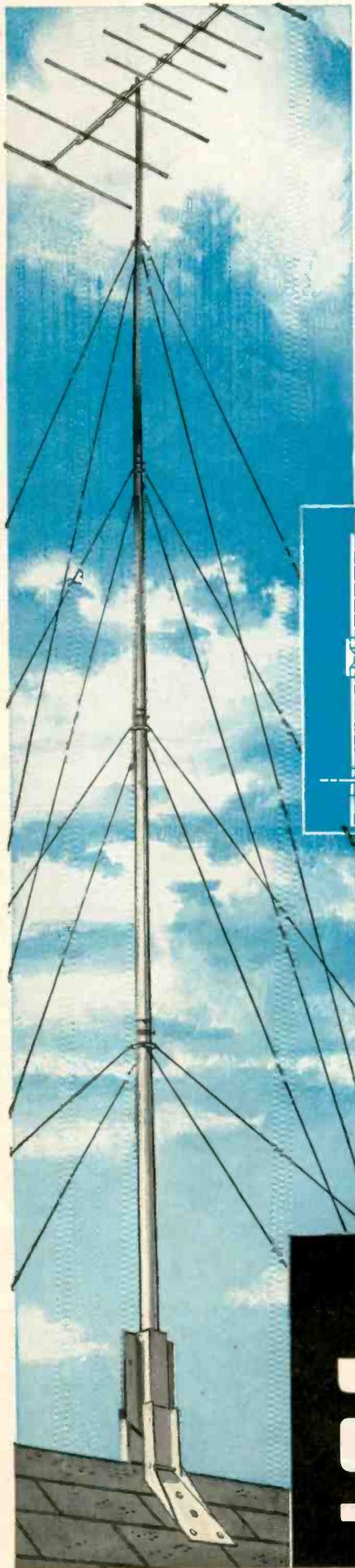
Hillside, New Jersey

• That's a choke to some, but not to others. Either you reactor you don't.—Ed.

New concept in telescoping TV masting  
... utilizes J & L Perma-Tube

# REDUCE YOUR TV MAST COST OVER 20%

Use high-strength, corrosion-proof J & L Perma-Tube 10-foot telescoping sections to easily construct 30 to 50-foot masts



Only J&L Telescoping Perma-Tube offers:

- Joint design which provides instant field assembly
- Machine-fitted joints that insure close tolerance for high strength and rigidity
- Guy wire ring position that eliminates all binding and guy wire interference

No longer is it necessary to buy expensive, ready-made masts. Now you can "tailor-make" your own with standard 10-foot lengths of 16-gage J&L Perma-Tube—and save money.

It's available in cartons from your local distributor in five diameters. The largest base section OD is 2¼ inches and each telescoping section is ¼-inch smaller, the smallest section having an OD of 1¼ inches.

J&L Perma-Tube in the 1¼-inch size can be used interchangeably as a fitted-joint section for smaller masts or as the smallest and topmost piece of longer telescoping masts.

Corrosion-proof J&L Perma-Tube is treated with Vinsynite—then coated both inside and outside with a metallic vinyl resin base. It successfully passes ASTM's 500-hour-minimum salt spray test—which guarantees Perma-Tube's longer life on the job.

Sturdy J&L Perma-Tube is made of a special, high-strength, J&L-produced steel. A 10-foot section of 1¼-inch diameter by 16 gage can support a weight at its center point of 200 pounds with a minimum of deflection and permanent set.

Order these new telescoping sections along with your regular 1¼-inch J&L Perma-Tube. Hardware—cotter keys or bolts, clamps and guy rings—may also be secured from your local distributor. For more information write J&L direct.

# J&L STEEL

*Jones & Laughlin*  
STEEL CORPORATION — Pittsburgh

Don't be fooled by **OUTSIDE** similarity . . .

## What's **INSIDE** makes the difference

### in **MALLORY FP** Capacitors

To see what makes Mallory FP electrolytics superior in performance, take a look at what's inside the can. You'll find—

**GENUINE FABRICATED PLATE ANODE . . .**

originated by Mallory, and available for replacement work *only* in the Mallory FP . . . gives excellent heat dissipation, low impedance, low inter-section coupling.

**ETCHED CATHODE . . .** prevents capacitance loss, reduces RF impedance.

**85°-C. CONSTRUCTION . . .** standard in FP's for years, at no extra cost . . . eliminates need for voltage de-rating, even for 450-volt units.

**LEAKPROOF SEAL . . .** prevents loss of electrolyte . . . withstands high temperatures . . . and still retains the venting feature.

There are other features, too . . . and many you can't see, such as the hospital-like sanitation maintained in the Mallory plant to guard against impurities which could shorten capacitor life. Add all these up, and you'll appreciate why FP capacitors are the *standard of performance* for replacement and for use in original equipment.

Order your stock of FP capacitors today, from your nearby Mallory distributor. They lead the field, yet cost no more.

Another *Service-Engineered* Product by . . .

P. R. MALLORY & CO. INC.  
**MALLORY**

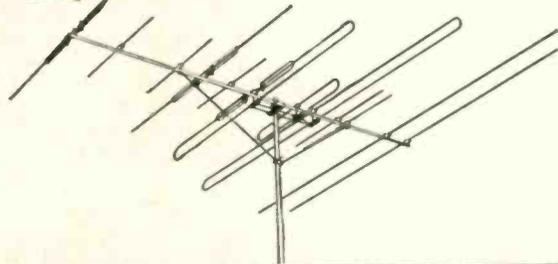
CAPACITORS • CONTROLS • VIBRATORS • SWITCHES • RESISTORS  
RECTIFIERS • POWER SUPPLIES • FILTERS • MERCURY BATTERIES

**APPROVED PRECISION PRODUCTS**

P. R. MALLORY & CO. Inc., INDIANAPOLIS 6, INDIANA



# make the **ZEE-BEAM** test!



## SUPER ZEE-BEAM ALL-CHANNEL VHF YAGI

Model 440

For extreme fringe areas. Features two pairs of dual reflectors and exclusive ZEE-X Electronic Elements.

List \$32.95

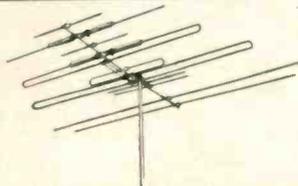
See Why **WELCO** Says:  
**Best Performance of Any Comparable  
Antenna . . . or Your Money Back!**

----- Low Band Pattern  
----- High Band Pattern



### ZEE-X Electronic Elements

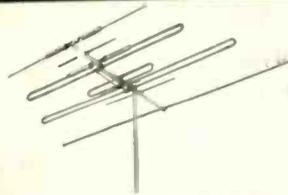
. . . a basic Welco development that makes possible many new outstanding antenna designs. The first element to function with true half-wave dipole characteristics and full efficiency on both VHF bands. Patent pending.



ZEE-BEAM ALL-CHANNEL VHF  
YAGI Model 220

For far fringe areas. Also features ZEE-X Element, exclusive with Welco.

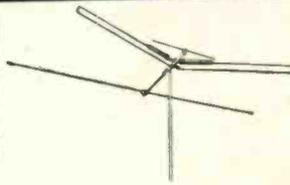
List \$24.95



ZEE-BEAM ALL-CHANNEL VHF  
YAGI Model 110

For fringe areas. Includes ZEE-X Element; a remarkable antenna for the price.

List \$18.75



CONICAL ZEE-BEAM ALL-  
CHANNEL VHF Model 50

For primary signal areas. ZEE-X Element. Single bay style. (2-bay style available also).

List \$8.95

### Send This Coupon in Today!

Prove to your own satisfaction . . . see why we say the ZEE-BEAM Antenna gives you the *best performance* of any in its price range now on the market! Order your ZEE-BEAM Antenna now; shipped freight prepaid.

BE THE LEADING ANTENNA INSTALLER  
IN YOUR AREA!

## WELCO MFG. CO.

Burlington, Iowa

### WELCO MFG. CO., 225 South 3rd Street, Burlington, Iowa

Please rush freight prepaid my ZEE-BEAM Antenna order for test. I understand this is a 30-day money-back guarantee offer.

<input type="checkbox"/> Model 440	Dealer Net \$19.77	<input type="checkbox"/> Model 50	Dealer Net \$5.37
<input type="checkbox"/> Model 220	14.97	<input type="checkbox"/> Model S-2 Stacking Kit	.96
<input type="checkbox"/> Model 110	11.25	<input type="checkbox"/> Technical Material	NC
<input type="checkbox"/> CHECK ENCLOSED FOR \$ _____		<input type="checkbox"/> MONEY ORDER ENCLOSED FOR \$ _____	

Name of Jobber \_\_\_\_\_

His Address \_\_\_\_\_

NOTE: You must enclose your jobber's name and address in order to take advantage of this special offer, so he will receive credit for your order.

Name of Authorized Dealer \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_

State \_\_\_\_\_

for servicing **color**

## YOU NEED SOMETHING EXTRA

For instruments actually ahead of today's circuitry... ready for the day when color TV becomes as general as today's black-and-white sets... look at the Hycon line, designed with the electronic serviceman in mind. Accurate enough for critical work in the shop, you'll also find these test instruments rugged, compact, lightweight... just what you need for those money-making house calls.

### MODEL 616 COLOR-BAR/DOT GENERATOR

... for adjusting and testing color receivers and transmitting equipment by manufacturer, station or serviceman. Features: Seven output forms of bars, dots, cross-hatch, phase and color-difference signals, including NTSC color bars. PANEL PRESENTATION SHOWS ACTUAL COLOR AND SEQUENCE OF GENERATOR OUTPUT. \$415.00



### MODEL 614 VTVM

Convenience at unprecedented low cost sums up this rugged, serviceable instrument. Hycon plus features include: 21 ranges (28 with peak-to-peak scales); large 6 1/2" meter; 3% accuracy on DC and ohms, 5% on AC; AC frequency response to 250 mc (auxiliary probe extra) AND TEST PROBES STOW INSIDE CASE, READY TO USE. \$87.50

### MODEL 617 3" OSCILLOSCOPE

Designed both for color TV servicing and laboratory requirements. Features high deflection sensitivity (.01 v/in rms); 4.5 mc vertical bandpass, flat within ±1 db; internal 5% calibrating voltage. Small, lightweight... but accurate enough for the most exacting work. SPECIAL FLAT FACE 3" CRT PROVIDES UNDISTORTED TRACE EDGE TO EDGE. \$269.50



See these latest Hycon money-makers — all in matching, bench-stacking cases — at your local electronic parts jobber.

# Hycon Mfg. Company

2961 East Colorado Street  
Pasadena 8, California

"Where accuracy counts"

ORDNANCE · ELECTRONIC TEST INSTRUMENTS  
ELECTRONIC SYSTEMS · AERIAL SURVEYS  
BASIC ELECTRONIC RESEARCH · AERIAL CAMERAS  
GC NO-GO MISSILE TEST SYSTEMS

## Editor's Memo

Most of us have come to recognize that you can't get everyone to like you. After all, there are so many different types of people with different ideas. It would be a dull and static world if everyone thought exactly the same, liking everybody and everything to the same degree.

Perhaps the real key is *who* likes you. This was pointed up in a recent incident I'll tell you about later.

Editors seem to be irresistibly attracted to statistics and surveys... and for good reason. By nailing down a phase of the industry to specific, scientifically analyzed statistics, we can give our readers an accurate report of the state of the servicing industry.

Typical of the problems we've tackled are: What problems prevent you from making an adequate profit? (see August 1955 issue, page 28); At what amount on a TV job estimate is the customer reluctant to have the job done? (see April 1955 issue, page 13). To find the answer, we query hundreds or thousands of technicians to obtain an adequate cross-section.

Now to get back to the recent incident I mentioned. One of the girls on the staff decided to conduct a subminiature survey of her own. Two people, to be exact. Naturally, the result of her survey will have little scientific value because the cross-section was way too small. But she did turn up a situation that illustrates a moral about liking things.

This gal had a little intercom unit that went on the blink. The circuit (what little there was of it) was simple as could be. So she brought the unit to a local tech for repair. While in the shop, she asked him if he was familiar with **TECHNICIAN**, and what he thought of it. Sure he was familiar with the magazine, it had the prettiest covers and all that, but he didn't like it one bit. Why? Well, the pages were filled with circuits and technical information that he couldn't understand. Like I said, you can't get everyone to like you. P.S. He couldn't fix the intercom.

So our gal took the little squawk box to another shop. Yep, you guessed it. The tech there thinks **TECHNICIAN** is tops, reads it studiously, and understands what he's reading. Oh sure, he fixed the intercom in a jiffy. And the editors breathed a sigh of relief.

Is the second fellow a good tech because he keeps up with the latest developments, or vice versa? That's something like asking whether the chicken or egg came first (it was probably the egg, through a mutation). Chances are that both factors are mutually dependent. The tech who's on the ball wants to be well informed, and because he is informed he steps out ahead of the crowd.

Al Foman

# RCA

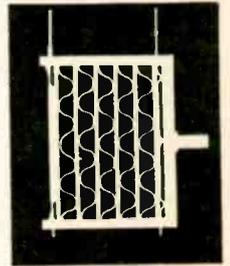
# SELENIUM

# RECTIFIERS

Now, RCA offers you a top-grade line of selenium rectifiers for general replacement use in TV, radio receivers, and phonographs. Advanced design, select raw materials, and superior workmanship give you a *dependable line* of selenium rectifiers for *virtually all* service jobs.

### Advanced Design for Dependable Performance and Long Life

Note the wide-open plate spacing for elimination of solid center "hot spot." Design utilizes corrugated spacers for *excellent heat dissipation and rigid construction for rugged service.*



**NEW**—smaller size . . . for any given current, they are smaller than other types.

**NEW**—quicker installation . . . integral mounting stud.

**NEW**—wide-open design . . . insures maximum heat dissipation, cooler operation . . . no center "hot spots."

**NEW**—rigid construction . . . for rugged service.

**RCA SELENIUM RECTIFIERS**—a *comprehensive line*—for consistently good performance, easier installation, longer life and customer satisfaction. **ORDER FROM YOUR RCA DISTRIBUTOR TODAY!**

**-one comprehensive line for virtually all replacement requirements!**

#### WIDE SELECTION OF 12 TYPES

Max. Output ma	Max. Input volts	RCA Type
65	130	205G1
75	130	200G1
100	130	206G1
150	130	201G1
200	130	207G1
250	130	208G1
300	130	202G1
350	130	209G1
400	130	203G1
500	130	204G1
400*	130	210G1
500*	130	211G1

\*Special thin types for use where available space will not permit the use of type 203G1 or 204G1.



**RADIO CORPORATION of AMERICA**  
ELECTRONIC COMPONENTS  
HARRISON, N. J.

*NOW... the Service Dealer can make*

# HI-FI PROFITS

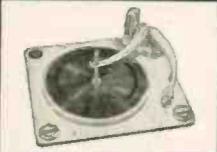
ONLY  
**TRANSVISION**  
OFFERS THIS  
4-POINT PROGRAM  
to the  
**SERVICE  
DEALER**

1. FULL PRICE PROTECTION.
2. NEGLIGIBLE INVENTORY INVESTMENT. A Sales Kit\* gets you started!
3. FINEST MATCHED HI-FI UNITS for custom-building or complete in beautiful furniture cabinets.
4. PRICES THAT ENABLE YOU TO UNDERSSELL COMPETITION.



You sell the Finest Matched Hi-Fi Components such as these:

RC101



RECORD CHANGER (famous English Collaro) with DIAMOND NEEDLE and RELUCTANCE PICKUP.

A102



AMPLIFIER: Superb Transvision 10 watt unit with built-in Pre-Amp.

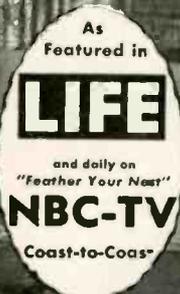
S101



15" Transvision DUAL SPEAKER SYSTEM with cross over network.

The Service Dealer sells the above complete system for only \$159!

\*SALES KIT for \$4.95 gets you started. Rush coupon for full details.



## BEAUTIFUL FURNITURE plus SUPERB HI-FI:

You can offer Hi-Fi quality equal to many \$1000 jobs on the market—for as little as \$159 to \$299. In component form for custom-building, or in complete "package" including fine furniture as shown above. (Bass reflex corner cabinet and lovely chairside end table.)

## SOLD ONLY THRU SELECTED DISTRIBUTORS

Write for name of the one in your area.

DISTRIBUTORS: Some areas still available. Write, wire, phone for complete program.

TRANSVISION, INC. • NEW ROCHELLE, N. Y.

TRANSVISION, INC., NEW ROCHELLE, N. Y. TM-10

Please send name of your nearest Distributor.

Rush full details on your Hi-Fi Dealer Program.

Name \_\_\_\_\_

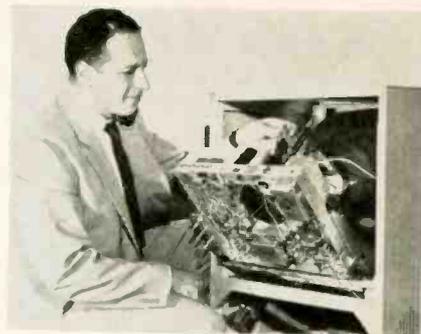
Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

## Tilt-Out Chassis Speeds Service

• A new wrinkle in chassis layout and positioning, in the face of recent innovations that complicate the life of the service technician, shows promise of making his lot a little easier. The design principle, which will be featured in the entire 1956 line of CBS TV receivers, is said to provide quick and easy access to all parts of the chassis with practically no disassembly problem.

Starting point for the innovation is a vertical chassis that has been turned around. In other words, when the technician removes the back cover of the set, the first thing he sees is the underside of the vertical chassis, including all subchassis wiring and tube sockets. Hinged at the bottom, the chassis may be swung out and down to an angle of 45 degrees, providing complete access to the chassis topside. Swung free in this manner, without removal from the cabinet, all tubes and top-of-set adjustment points, as well as the underside, are accessible without obstruction, as shown.



Convenience for servicing provided by new tilt-out chassis, demonstrated by CBS-Columbia Director of Product Services, Daniel Newman.

In handling a tube problem, for example, CBS-Columbia Director of Product Services Daniel Newman points out that there could be the usual use of the continuity tester to locate open filaments on the underside as soon as the back has been removed. Swinging out the chassis then facilitates quick replacement of the tube. The chassis is then swung back to normal vertical position and locked in place—particularly convenient for service in the home.

Extensive field testing has preceded introduction of the tilt-out chassis. As an example of its convenience to the service industry, Newman points out, a tube replacement job is estimated to take 60 per cent less time.

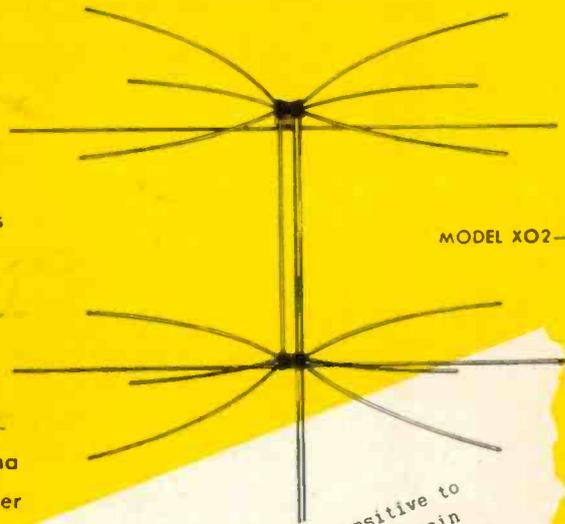
# EXPO

**Have you ever seen  
or heard of the  
Exponential Antenna?  
You have not, for until  
now it was unknown to  
the engineering world.**

## WHAT IS EXPO?

EXPO, the exponential antenna, represents an historical technical advance that eliminates the crippling frequency limitations of all known antennas by the use of exponentially curved elements.

The ultimate in antenna design! One antenna for all 83 channels with gains progressively increasing with increase of frequency. This principle recently discovered\* is the basic answer to the limited bandwidth problem. There is no need for multiple antenna installations or other expedients to gain slightly wider bandwidth operation.



MODEL XO2-2 BAYS

### Higher gains

- one antenna
- one transmission line
- one installation.

### That is EXPO.

Servicemen will appreciate the ease and speed of installing EXPO: occupies less space — pleasing appearance — supreme performance. Its performance sells it for you.

Will you be among the first to see it perform? Consult your distributor, or for further information, write:

\* Patent applied for.

Here is an antenna that is insensitive to frequency variations -- except that gain increases as you go higher in the spectrum, reaching astounding gains in the upper VHF and throughout the UHF regions. Where wide bandwidth operation is necessary as in T.V., EXPO ushers in a new era in antenna design, wiping out the frequency restrictions of straight element antennas.

EXPO comes in 1, 2 and 4 bays in the standard and deluxe models. The standard models use a single parasitic reflector while the deluxe models employ a screen-type reflector for areas in which the ultimate in back attenuation and increased forward gain is desired.

**HOLLOWAY ELECTRONICS CORP.**

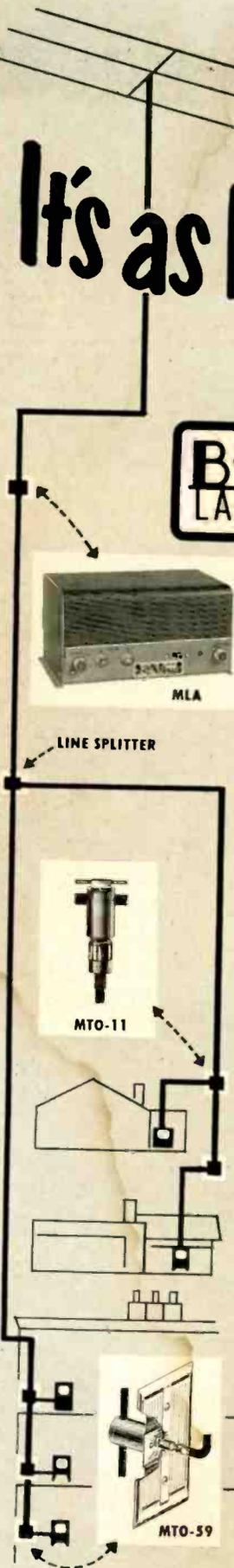
Fort Lauderdale, Florida

# It's as EASY as This

TO INSTALL A  
MASTER TV SYSTEM  
WITH



## Masterline UNITS



**A** Connect the antenna line to the INPUT of your Masterline MLA Line Amplifier. The signal is now amplified 37db (70 times).

**B** Connect a line splitter or line coupler to the OUTPUT of the MLA. You now have 2 or more branch lines for feeding to TV receivers.

**C** Where the branch line is run out-of-doors, connect a Masterline MTO-11 (outdoor tap-off) wherever a TV set feed line is required.

**D** Where the branch line serves as a riser inside a building, connect a Masterline MTO-59 (wall-plate-tap-off) wherever an antenna outlet is required.

This is only one example of a Master TV System, to show the flexibility of Blonder-Tongue distribution equipment. There are many more, all covered in the new B-T INSTALLATION MANUAL.

Write for your Free copy to Dept. FK-18  
**BLONDER-TONGUE LABORATORIES, INC.**  
WESTFIELD, NEW JERSEY

Manufacturers of TV Cameras, TV Amplifiers, Boosters, Converters, Accessories and Originators of the Masterline and 'Add-A-Unit' Master TV Systems.



The state of the employment market for TV technicians has improved with the fall business upswing. Pay scales range from \$50 to \$125 per week for full time outside and benchmen.

For techs with little experience, jobs are being offered at \$50-\$55. Most of the positions open for experienced men are in the \$75-\$85 category. Those jobs over the \$100 mark generally demand any or all of the three following requirements:

1. Crackerjack trouble shooter.
2. Have own car and equipment.
3. Profit-sharing commission for large jobs or "selling" extra service.

Evening and weekend work for qualified techs with their own car and equipment pays in the vicinity of \$3/hour.

A spot check of help wanted columns in leading Sunday newspapers around the country has been made by TECHNICIAN editors. The following advertised openings for TV service techs were found:

**CHICAGO:** 11 openings. No listings of pay scales. Strong demand for highly experienced men.

**MIAMI:** 1 opening. \$75. Repair and delivery.

**MINNEAPOLIS:** No openings.

**NEW YORK:** 18 openings. \$50 to \$125. Strong demand for techs with cars; fully experienced.

**ST. LOUIS:** 5 openings. To \$100. Preference for good experience.

### GC TUBE CHECKER

A handy little series filament tube checker is claimed to be an easy, fast way to find bad tubes. The "G-C Tube-Check" quickly identifies burned out tubes by plugging them into the proper socket of the tester; there's no waiting for the tubes to warm up. The tester plugs into TV-interlock or cheater cord. Designated Catalog No. 9270 it nets to the dealer for \$3.25. General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—TECHNICIAN (Ask for No. 10-59)

**AGAIN  
IN '55**

**ALLIANCE GIVES YOU...**

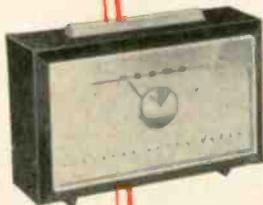
**biggest, longest  
TV SPOT  
CAMPAIGN**

**30,000,000  
TV VIEWERS**  
*week after week*



New

**MODEL U-98**—fully automatic—incorporates 32 distinct improvements—eliminates all arcing and consequent picture distortion—points directly, positively, instantly to target station—*“just set it and forget it!”* . . . List Price, **\$39.95**



New

**MODEL T-12**—fingertip electrical operation. Rocker switch on top controls turning. Has direction indicator dial. Compact and smartly styled. Highly accurate! . . . List Price, **\$29.95**

When you sell Alliance Tenna-Rotor, you sell the pace-setter—the favorite for seven solid years!

30,000,000 folks see Alliance TV spots week after week . . . newspapers and magazines run hard-hitting Alliance ads all over the country . . . that's promotion—**sends sales your way!**

Alliance is sold the most, because it's seen the most. You profit most, coast-to-coast, with Alliance.

**Don't be misled!** Sell the acknowledged best-seller, best-money-maker . . . Alliance Tenna-Rotor!

**IMPORTANT!** COLOR is coming! Alliance Tenna-Rotor is the No. 1 TV accessory needed for sensitive color reception.

**Nearly 2,000,000 Alliance Tenna-Rotors are in use.**

**THE ALLIANCE MANUFACTURING CO., INC.**

*Alliance, Ohio*

# WHAT

# have you got



# that other

# TV-Radio servicemen

# haven't got?

When you are a *Raytheon Bonded Electronic Technician*, the answer is simple. You have the exclusive tool, the *only* tool in the industry that creates customer confidence — *draws customers to your shop.*

Under the Raytheon Bonding plan, your work and parts guarantee is backed by a Bond issued through one of America's largest insurance companies. Customers appreciate the value of this extra protection and, all else being equal, give their business to the Raytheon Bonded Dealer.

If you can qualify for the Raytheon Bond, it won't cost you a penny. Call your Sponsoring Raytheon Tube Distributor today for the whole story.



*Excellence in Electronics*®

## RAYTHEON MANUFACTURING COMPANY

Receiving and Cathode Ray Tube Operations  
Newton, Mass., Chicago, Ill., Atlanta, Ga., Los Angeles, Calif.

RAYTHEON MAKES ALL THESE:

RECEIVING AND PICTURE TUBES • RELIABLE SUBMINIATURE AND MINIATURE TUBES • SEMICONDUCTOR DIODES, POWER RECTIFIERS AND TRANSISTORS • NUCLEONIC TUBES • MICROWAVE TUBES

# TECHNICIAN

## & Circuit Digests

CALDWELL-CLEMENTS, INC., 480 LEXINGTON AVENUE, NEW YORK 17, N. Y.

### Tricks with Tubes—Lesson Two

A very hot summer has passed, and we might venture the guess that it was made doubly hot for receiving tube reproducers by the report on this racket in our July issue. Through the publication of this report, and subsequent distribution of many thousands of reprints, almost everybody in the industry learned Lesson Number One: Think twice before you buy odd-brand and bargain tubes.

Here's Lesson Number Two: Even when you buy standard brand tubes, your safest bet is to accept them only if they are in the manufacturer's original individually-boxed carton.

Want proof? Take a look at the three tubes pictured in this month's "Tuning In the Picture" section. They look good. They bear the name of a leading tube maker. They were even made by that manufacturer—but not two years ago, as indicated by the base date-code. They

were made five or more years ago. At least one of the tubes has been used for hundreds of hours. Then some unscrupulous operator got hold of them, washed off the original base date-code and brand, and rebranded them with a new warranty code—all unknown to the original manufacturer. This unethical practice is carried on today using the tubes of almost all leading brands, not just the one shown in the picture.

These tubes, purchased over the counter at a "bargain" price by TECHNICIAN editors, are typical of the rebranded tubes being sold across the country as new. Observe that two tubes came in plain boxes, with only rubber stamped or penciled marking on the cover. One tube came without any box.

Be suspicious of plain boxes. Original manufacturer's individual cartons are a worthwhile safeguard. **BE SAFE—BUY BOXED!**

### Overlooked Opportunities

Technicians generally overlook a wonderful opportunity to boost their profits in a manner requiring a very minimum of effort. It might be summed up in a simple slogan: Sell While You Service! Recognize the wonderful position you are in when you enter a customer's home to repair his set—a position for which most salesmen would be very grateful. You come by invitation. You will remain in the house for some time. You are the electronic expert. You will be the center of the customer's attention.

Take the opportunity to do some selling—the low pressure kind. It's legitimate, and the customer should be appreciative that you called a particular product or service to his attention. Here are some approaches:

1. Keep your eyes peeled for audio opportunities. In large houses, intercoms between kitchen and work shop, or baby's room and living room or patio are very convenient. Other occasions for audio sales are in the home of a music lover (adding extra hi-fi speakers, peaking the sound system for optimum performance, etc.) and the home of someone hard of hearing (TV sound induc-

tively coupled to hearing aid, audio-visual devices, etc.).

2. It's easy to praise the beauties of color TV . . . and hint the social prestige. The next step is a casual invitation detailing where and when it can be seen.

3. Alerting the customer to a weak or partly worn element can mean a sale to you, and a saving to customer of labor charges on a future service call. Incidentally, by explaining that a part is weak but still workable for a time, you protect yourself against future accusations that the job was not done properly.

5. Wherever you see a table model TV set that could be made more convenient if it could be moved, talk up the appeal of attractive swivel tables. Women are often easy to sell on this item.

6. Don't pass up the sales appeal of remote controls for TV receivers. Its comfort giving potential is sure to please many a channel-changing set owner.

With this as a start, other sales ideas will occur to you. Remember that the approach should be subtle so your customer does not feel he is being pressured. But don't overlook opportunities: Sell While You Service.

### Do You Talk Too Much?

An industry old-timer describes a noteworthy observation in our "Letters to the Editor" section this month. He says that service technicians talk too much for their own good, telling the customer exactly what is

wrong with his set. Then the dollar-conscious set owner visits the local distributor and buys the needed part he never could have found by himself.

Quiet, please!

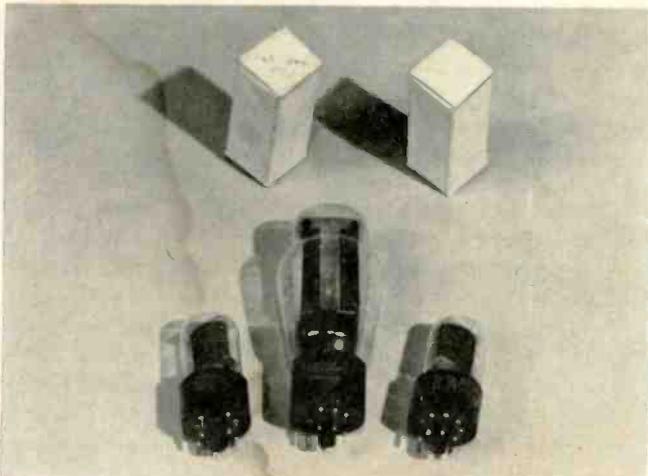
# Tuning In the

**HEAT AND HUMIDITY**, abnormally high in many parts of the country this summer, have played havoc with TV set performance. Multiple troubles involving leaky capacitors and changed resistance values are common results. In the areas affected, some shops are loaded down with three or more times the usual number of defective sets requiring bench work. If your area has been hit by abnormal hot-wet weather, save yourself time by being on the lookout for troubles of this nature.

**HURRICANES** will knock down over 100,000 TV antennas on homes along the Atlantic coast this year, predicts Harold Harris, Channel Master VP. His advice to antenna owners, which technicians should pass on to their customers: find out if your TV antenna is included in your present personal and property liability insurance policies.

**"DON'T DO IT YOURSELF"** is the slogan being stressed by Betty Furness on the Westinghouse "Studio One" TV show. See your service technician, is the message going to more than 20,000,000 viewers weekly.

**WHAT'S TROUBLING YOU?** Early reports from readers on their ratings derived from "Your Trouble Scoreboard," published in the August issue, indicate that the situation is generally under control. Jan's Radio Shop, Erie, Pa., has a Troublemeter rating of 34, which is pretty fair shape. Out in California the scores run 55 to 60, or normal. What's your score?



Rebranded "bargain" tubes purchased over the counter by TECHNICIAN editors. The two 6K6GT's were bought in the plain boxes shown, the 5U4G without any box. All three were actually made by RCA, but not two years ago, as indicated on the base date-code. One 6K6GT was made previous to 1950, the other early in 1951. The 5U4G was made before 1951, and has been used for hundreds of hours. Unknown to RCA, some unscrupulous operator washed off the original brand, and rebranded all these tubes with a newer date code. Similar techniques are used with tubes made by other manufacturers. Superficially, the tubes look good. To make certain you don't get stuck with such tubes, BE SAFE—BUY BOXED . . . in the manufacturer's original carton.

**SMASH THE TUBE RACKET** campaign promoted by Philco offers 5¢ for every old tube turned in on a new Philco tube. The junked tube is smashed right in front of you. The company is also conducting a fix-it campaign for \$1 plus parts to have the public bring their radios into local shops for repair.

**STATISTICAL ROUNDUP:** Some 37,500,000 TV sets are in use as of Oct. 1. Over 7,000,000 TV sets will be sold to the public in 1955. 2/3 of all family units have TV receivers. Half of the sets in use are 21-inch. 1,300,000 TV's will be scrapped in 1955, over 90% of them 17-inch or smaller. Over 80% sold this year were 21-inch.

**TDGF.** Yep, Technician's Dumb Girl Friend is back after insisting she wanted to try on a single sideband . . . thought it was a half-girdle. She thinks high-Q is found in a pool room, mu only comes from cows, and a chassis cradle is another name for a hammock. She burned her boy friend by giving him a corona to smoke, claims a nut driver is an asylum chauffeur, and reports that flux is her favorite toilet soap. She swears that pot noise is only her stomach gurgling.

**PRE-RECORDED TAPE** is growing into a profitable sideline for some dealers, who also find that these tape recordings are excellent demonstrators, boosting recorder sales. Two relatively new companies marketing these tapes at \$6.95 for a 7-inch reel, with special discount arrangements for dealers, are Recorded Tape of the Month, P. O. Box 195, Radio City Station, New York, N.Y., and Berkshire Recording Corp., 150 W. 90 St., New York 24,, N.Y.

## OCTOBER 1955 NETWORK COLOR TV SCHEDULE

<b>SATURDAY, October 1</b>			
9:00—10:30 PM (EDT)	NBC	"Heidi" (Max Liebman Presents)	(Live)
<b>MONDAYS through FRIDAYS</b> October 3-7, 10-14, 17-21, 24-28, 31			
5:30—6:00 PM (EDT)	NBC	"Howdy Doody"	(Live)
<b>SUNDAY, October 9</b>			
7:30—9:00 PM (EDT)	NBC	"Show Biz" (Color Spread)	(Live)
<b>SATURDAY, October 15</b>			
3:00—5:30 PM (EDT)	NBC	"Notre Dame vs. Mich. State" (NCAA Football Game)	(Live)
<b>MONDAY, October 17</b>			
8:00—9:30 PM (EDT)	NBC	"Cyrano de Bergerac" (Producers' Showcase)	(Live)
<b>TUESDAY, October 18</b>			
8:00—9:00 PM (EDT)	NBC	"Milton Berle"	(Live)
<b>SUNDAY, October 23</b>			
4:00—5:30 PM (EDT)	NBC	"Alice in Wonderland" (Maurice Evans Presents)	(Live)
<b>SATURDAY, October 29</b>			
2:30—5:00 PM (EDT)	NBC	"Iowa vs. Michigan" (NCAA Football Game)	(Live)
<b>MONDAY, October 31</b>			
3:00—4:00 PM (EDT)	NBC	"Matinee Theatre"	(Live)

In addition to the above schedule, NBC will color-cast all World Series games played in New York. There also will be color inserts in the "Home Today" show.

CBS plans an extensive schedule which is not available at press time.

# Picture .....



**EASY CREDIT** for pix tube installations is available through a General Electric finance plan. Technicians are reimbursed in full by their GE tube distributor for GE tubes, parts and labor. Customer pays as little as \$5 down, and has six months to pay.

**PAY-AS-YOU-SEE TV:** In a brief filed with the FCC, Int'l Telemeter Corp. predicts TV "road-showing" of top Broadway stage hits throughout the country at an eventual cost of 30 to 40 cents per home per show, using its system. Estimate is based on the expectation that 8 million sets—almost one quarter of the total number now in use—would pay to get one of these shows.

**DO YOU WANT TO WIN** a free signal tracer worth \$348? Or a \$329.50 oscilloscope? Or any of 104 other prizes? Then fill out the entry blank for the Technician Test Equipment Contest in this issue, and mail it in right away. No boxtops or gimmicks required.

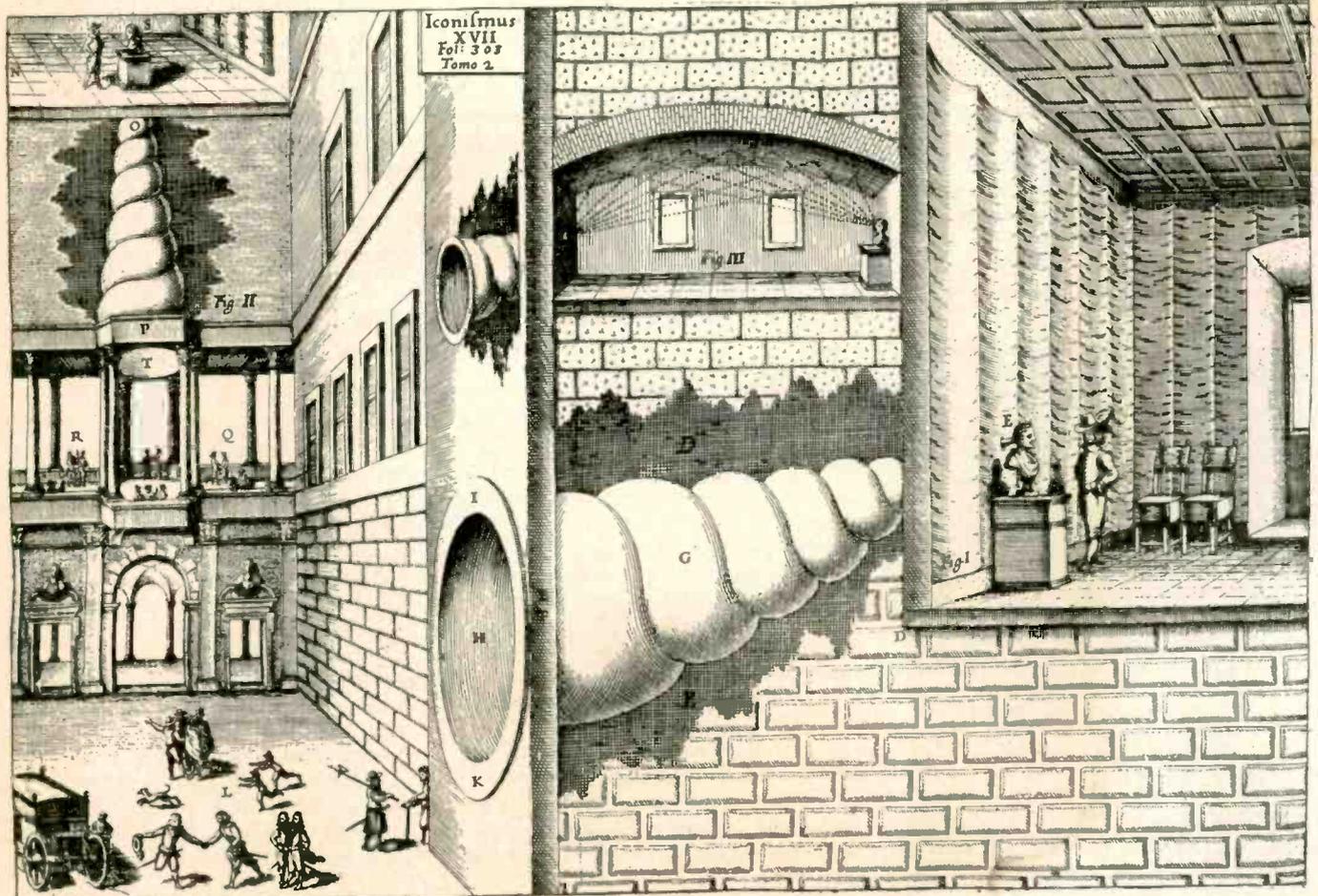
Prophetic vision of sound transmission system of the future, from an engraving made in 1673, was conceived by Athanasius Kircher. Conversation of people in the court at the lower left is carried through "amplifier" tubes shaped like the spiral cochlea inside the ear. The

## CALENDAR OF COMING EVENTS

- Oct. 3-5: Eleventh National Electronics Conference, Hotel Sherman, Chicago, Ill.
- Oct. 12-15: 1955 Convention, Audio Engineering Society, Hotel New Yorker, New York, N. Y.
- Nov. 4-6: Philadelphia High Fidelity Music Show, Benjamin Franklin Hotel, Philadelphia, Penna.
- Oct. 21-23: New England Hi-Fi Show, Hotel Touraine, Boston, Mass.

**TRANSISTORS** continue to make news. Raytheon has come out with a new transistorized twin-speaker personal radio that plays for 2500 hours, or two years normal playing time, on an "A" battery pack. The \$89.95 unit will play for 500 hours on four flashlight batteries. GE is making a 15-ounce pocket radio for \$49.95, which has five transistors and measures 5 5/8 x 3 3/16 x 1 1/2 in. GE has also announced transistor price cuts of 15 to 50%, bringing the price range down to \$2-\$3 in quantity lots to manufacturers.

tube feeds a "loudspeaker" in the form of a sculptured head, as shown on the right. For more information on remarkable forecasts in TV-electronics, see "Your Electronic Future," page 28, which heralds an \$8 billion servicing industry by 1975. (Bettman Archive)



# Test Equipment Standards for

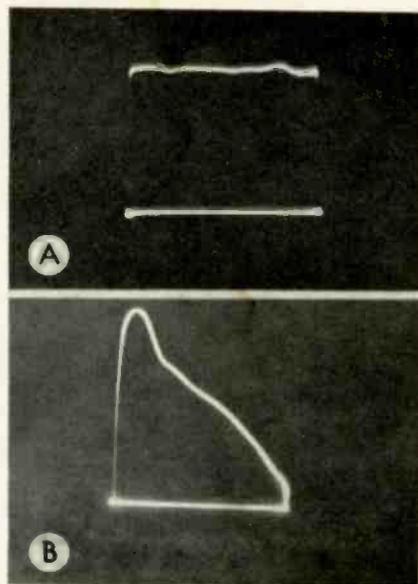
## Stiffer Requirements Are Made of Service Instruments; Why

ROBERT G. MIDDLETON,  
SIMPSON ELECTRIC CO.

• Since operation of color-TV receivers is considerably more critical than black-and-white sets, somewhat better sweep-alignment equipment is required for satisfactory color servicing. "Better" involves the accuracy, or the flatness of the output, as illustrated in Fig. 1. Unless the output voltage over the swept band is reasonably flat, the technician will misalign the receiver circuits in unknowingly compensating for the non-linear generator characteristic. Fig. 2 illustrates the technique used for determining linearity of generator output.

By "better" is also meant the accuracy of the marker frequency indication. Although an experienced operator, fully aware of inaccuracies in a marker generator, can make necessary allowances in readings (See *Calibrating Your Signal Generator*, p. 20, July 1955), it is generally desirable to use a marker generator which is crystal calibrated over the color-signal ranges. Small inaccuracies in locating the color-subcarrier and sound-trap frequencies can lead

Fig. 1A—Acceptable linear sweep-generator output. B—Serious nonlinearity of output.



to serious trouble in color reception. The output from the marker generator must also be adequate in level, and it is preferable to utilize an instrument which operates on fundamentals.

A sweep generator for color-television service must also provide extended low-frequency sweep, to meet the requirements of aligning the bandpass amplifier, of checking the response of the Y amplifier, adjustment of the wideband demodulator (I circuit), and checking of the narrow-band demodulator (Q circuit). It is also desirable upon occasion to check the responses of the red, green, and blue video amplifiers, and to

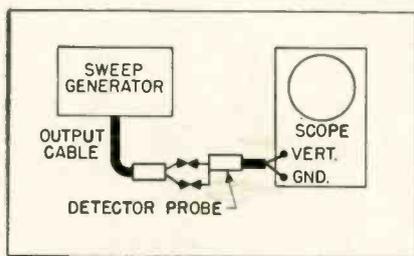


Fig. 2—Arrangement for linearity checking.

check the frequency response of the matrix circuits. Such checks (see Fig. 3 for some typical responses) require sweep-signal output down to at least 50 kc, and preferably down to 15 kc, so that auxiliary low-frequency tests do not have to be made at the bench.

Although narrow-band scopes having response only through the audio-frequency range serve adequately for alignment of color-TV circuits, wide-band scopes are required for troubleshooting. For example, the color burst on the back porch of the sync pulse seen in Fig. 4A cannot be displayed properly unless the scope has full response at 3.58 mc; likewise, checking the response of chrominance circuits to color signals requires full response at 3.58 mc. See Fig. 4B.

It is sometimes considered that a narrow-band scope can be converted to a wide-band scope by applying the signal directly to the vertical-deflection plates of the cathode-ray tube. This supposition is true, pro-

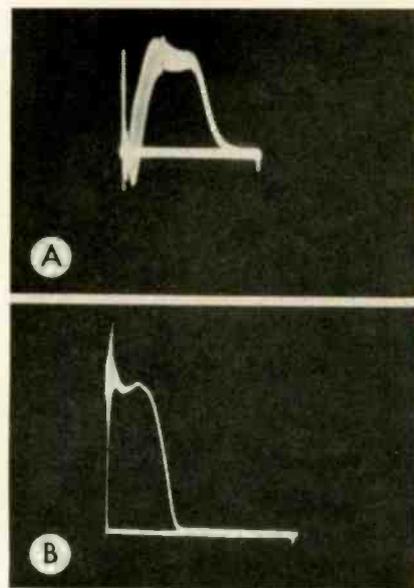


Fig. 3A—Q channel response (to 0.5 mc). B—Response of red amplifier (60 cps to 3.5 mc).

vided sufficient signal voltage (about 75 volts minimum) is available without additional amplification to excite the plates. In general, however, the color signal voltages are far less, and cannot be displayed in this manner.

Some auxiliary scope amplifiers which have made their appearance, however, serve satisfactorily to convert narrow-band scopes to wide-band scopes. Some manufacturers provide scope conversion kits, whereby older narrow-band scopes can be rendered suitable for color-TV application. In any case, it is essential to note that the separate amplifiers do not operate as pre-amplifiers for the existing vertical amplifier in the narrow-band scope, but replace them completely.

Experience with color-TV servicing procedures soon convinces the technician that open test leads are often unsuitable because of hum pick-up, stub-resonance action, and circuit loading. Fig. 5A shows the severe blurring of pattern caused by pick-up of stray fields from the horizontal-deflection circuits, with the enormous improvement which is obtained when a shielded input cable and probe are used, as illustrated in Fig. 5B.

# Color TV Servicing

*These Increased Demands Are Necessary*

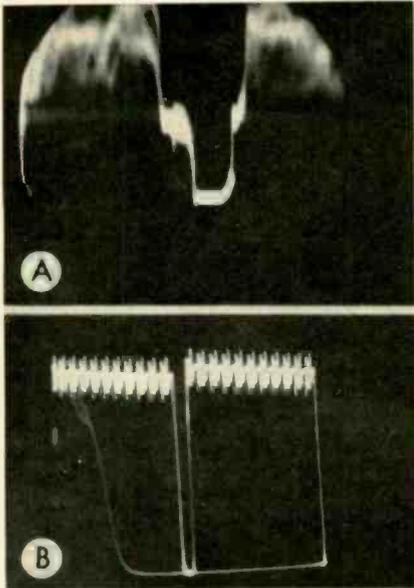


Fig. 4A—Horiz. sync pulse showing burst signal (right-to-left scope deflection). B—Appearance of signal in chrominance circuits.

(There is some misunderstanding concerning true "probe" devices; these are often confused with signal cable termination devices. A true "probe" device is an input arrangement, while a "termination" device is an output arrangement. Thus, sweep generators use termination devices, while scopes use probe devices.)

Probes used in color-TV service work include the low-capacitance probe; the high-voltage capacitance-divider, for use in checking high-voltage circuits; and a signal-tracing demodulator type of probe, which finds useful application in various alignment procedures, in signal-tracing high-frequency circuits, and in checking the accuracy of sweep generators, as already illustrated, earlier.

It should be understood that no matter how fine the characteristics of a probe may be, it cannot perform better than is permitted by the scope itself; in other words, a poor vertical amplifier in a scope cannot be improved by use of a probe. The scope should always have better characteristics than the color-TV circuit under test, in order to obtain a definitive test result.

In heavily industrialized and in

rural areas, the service technician is often annoyed by fluctuating line voltage. Service scopes are not always completely regulated, and the low-voltage power supply in a color-TV receiver is even less likely to be regulated. In consequence, pattern jitter as illustrated in Fig. 6 is sometimes encountered. Such jitter can be avoided by the use of an automatic line-voltage regulating transformer. Confusion is sometimes encountered, by failing to distinguish between a manually variable transformer, and an automatic regulating transformer. The latter type is required to eliminate jitter. It is also useful in providing better accuracy of voltage measurements, by maintaining the input voltage to the receiver at its rated value of 117 volts. •

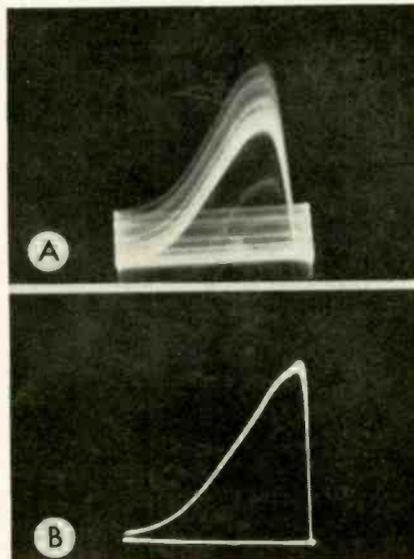
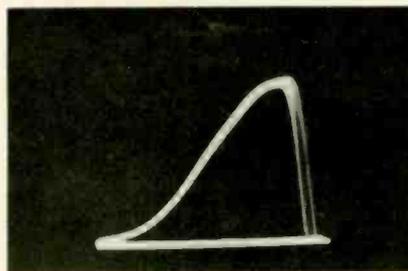


Fig. 5A—Trace blurring caused by stray pickup. B—Lead shielding cleans up the same pattern.

Fig. 6—Line-voltage fluctuation produces horizontal jitter; better regulation needed.



"COMPACT" COLOR TV: Large cabinet size, made necessary by chassis size, has been an obstacle to acceptance of color receivers. Raytheon has introduced a space-saving vertical color chassis that fits around the 3-gun 21-in. tube, reducing cabinet size to proportions comparable to those of present monochrome sets. Available in table-model (\$795) or console (\$895) versions, the receivers feature 28 tubes including crt and rectifiers and top tuning, with only 2 external color controls in addition to the conventional control line-up found in b-&-w sets.

INCREASED COLOR PROGRAMMING for the remainder of 1955, with still further increases due next year, will boost consumer interest in buying the receivers. NBC alone promises 120 hours of color broadcasting from October to the end of the year. This represents a 5-to-1 increase!

MERCHANDISING WITH COLOR, tried experimentally by Gimbels N. Y. department store, attracted considerable attention. Using Du Mont's Vitascan pickup and transmission system in an in-store closed circuit, Gimbels broadcast 10-minute hourly merchandising periods in full color. Monitors spotted throughout the store and in a street window attracted thousands of shoppers, who were also invited to see themselves in color TV. Result was a "gratifying increase" in store traffic and sales, with new impulse buying on items featured in the demonstrations.

PRICE CUTS ON COLOR SETS have been announced by CBS-Columbia. The 205C color receiver, a full-door console formerly priced at \$1100, has been cut to \$795. The set uses the CBS-Hytron 205-sq.-in. crt.

NEW SERVICE MANUAL on RCA color sets, 36 pages, has been announced as a supplement to "Practical Color Television for the Service Industry." In addition to additional information on color in general, schematics and other detailed data on the manufacturer's current 21-in. color receivers and service hints and procedures are featured. Price is 75 cents through distributors. With acquisition of more building space at Lancaster, Penna., RCA also announces plans to step up production of color kinescopes, as well as other tubes.

# "Tough Dog" Corner

## Difficult Service Jobs Described by Readers

### Pix Bounces with Audio

This "beaut" had us going in circles for a while . . . We took in a Silvertone, chassis 528-292-2, for replacement of the deflection yoke. After restoring the set to operation we found the picture bounced in tempo with the audio. Naturally, the customer denied that the set had ever done this previously—although his wife inadvertently dropped a contradictory statement to the effect that this had always annoyed her with the set.

Investigation showed that there was nothing wrong, and therein lies the tale. Voltages were checked carefully in the 6W6-GT audio output stage; all agreed with those given on the schematic, and all of them fluctuated with the audio. Fluctuation was extremely bad on the cathode, which ties directly to the 125-v bus. The schematic diagram calls for -2.5 v on the control grid, which was present, but the tube manual recommends -7.5 v in such operation.

An audio-frequency sine wave was fed into the audio amplifier stages, and the output was scoped at the plate of the 6W6-GT plate. There the trouble was indicated by the distortion in the waveform.

Insufficient grid bias was causing the tube to draw excessive current on positive audio peaks at the grid. Since this current was drawn from the 125-v bus, which is the B-plus supply line for the i-f, agc and sync

stages, all of the mentioned portions of the receiver suffered in step with audio peaks that loaded this voltage source heavily.

One slight modification, the substitution of a 3k, 10-w resistor (R<sub>1</sub> in the accompanying sketch) in place of the 15k, 2-w resistor that was originally in the circuit, put operating voltages where they belonged and cleared up the symptom. —Richard E. Simpson, Hialeah, Florida.

### No Pix, No Symptoms

Absence of a picture, in this case, could be traced to the video amplifier stage itself: video signal was present at the grid of this tube, but there was no signal at the plate. A voltage check of the tube in this conventional video-amplifier stage showed normal B-plus present at the plate and screen grid. Zero voltage was at the control grid, and 12 volts were found at the cathode, indicating that the tube was conducting. As a further check, the tube was removed from its socket and a reading was then taken at the cathode pin. The reading at this point now dropped to zero, showing that the 12 volts bias was being developed entirely by tube conduction—but there was still no output at the plate.

The set was turned off and resistance measurements were made. The plate resistor checked okay. The cathode resistance consisted of a 47-ohm fixed resistor in series with a

### \$10 For Your "Tough Dog Story"

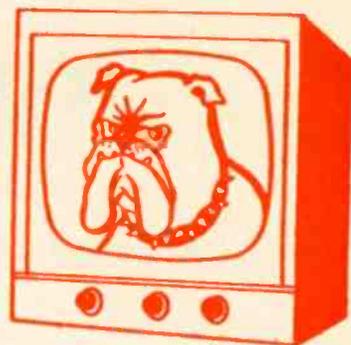
Have you tangled with a difficult or obscure service problem recently? Write it up, telling us how you liked it. Use drawings to illustrate your explanations wherever necessary. A rough sketch will do as long as it can be followed. Send it to "Tough Dog" Editor, TECHNICIAN, Caldwell-Clements, Inc., 480 Lexington Ave., N. Y. 17, N. Y.

1000-ohm potentiometer to ground. As this pot, the contrast control, was turned, cathode-to-ground resistance varied from about 50 to 1000 ohms, as expected.

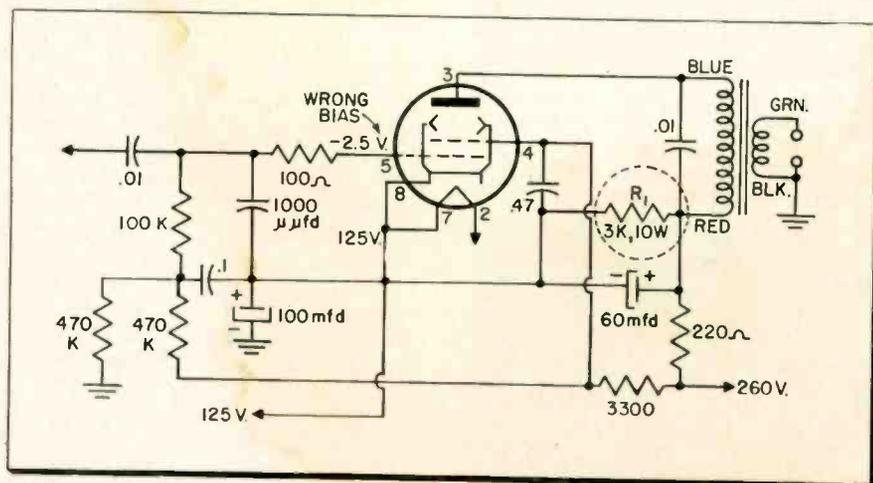
Another tube was substituted. Another vtvm was used to check all previous measurements. The results were the same, with all readings still within normal range, and still no picture. Observation had thus far indicated that the tube was cutting itself off with its own cathode bias! When basic electronic principles no longer seem to apply, experience has taught, there is almost always some oversight or error in observation.

In this particular case, voltage measurements had to be assumed to be correct, since they were taken with two different meters while the set was in operation and the defect was present. However, there could be a false indication in the resistance measurements since they had to be taken, of course, with the set turned off. Readings taken during operation, if possible, might have been different. Substitution would be one way of making sure, in the case of the cathode-circuit resistors, a jumper applied first across one and then the other during operation should indicate something. Sure enough, a jumper across the 47-ohm resistor brought back the picture. This resistor, which checked okay without load, evidently was increasing considerably in value when subjected to current flow.

The resistor was replaced, the set was restored to operation, and Ohm's Law once again was inviolable.—Ivan White, Albuquerque, New Mexico.



Heavy drain on audio tube dropped B-plus to other tubes, caused pix to bounce with sound.



# Antenna System Problems

## Shielding Out Ignition Noise; Transmission Line Woes

### Suppressing Ignition TVI

Where reception is seriously hampered by noise flashes caused by the ignition systems of passing traffic in a nearby busy street, strips of chicken-wire screening laid on the roof-top can effectively minimize the problem.

In one such installation, the strips were bonded together to form a continuous ground plane shielding the antenna from the street, as in Fig. 1A. Bonding consisted of joining the strips well mechanically and then soldering them together. The strips also had to be bonded to the mast but, since soldering at this point is difficult, clamps were used. The antenna was so positioned back on the roof that a straight line drawn from any point on the street below, including the opposite curb, would have to pass through the ground-plane screen in order to reach the antenna.

For effective operation, the protective screen must also be grounded. Since the driven element of the antenna used was a folded dipole, the use of a separate ground wire from the roof to an earth ground was avoided. Since the mid-point of a folded dipole is neutral, the screen was connected to this point by means of clamps from the mast to the center of the dipole, as shown schematically in Fig. 1B. In this way, the transmission line could be used as the ground lead. To bypass the ignition interference to ground while permitting signal to reach the set, the illustrated filter was installed near the receiver's antenna terminals. The 5k resistors across the line are too large to create a mismatch. The 0.001-mfd capacitors couple high-frequency signal into the set, but block the lower-frequency TVI, which passes through the resistors and to earth ground, by way of the center-tap connection, to a water pipe or other suitable point. The receiver chassis itself was connected to the water-pipe ground through a 0.1-mfd condenser, not shown.

### Reradiated Jitter

In the course of cleaning the living room, a housewife will often bundle up the transmission line and hang it

on the back of the TV set, where it is fairly close to the yoke leads, and then go on about her chores. Much later, when she turns the set on, she may find a nice case of jitter, vertical, horizontal or both. Making no connection between her action and the symptom, she calls up for TV service.

The large pulse voltages on the yoke leads do not ordinarily cause trouble, but can do so if the antenna input runs too close to them. Reintroduction of the pulses into the antenna input—after delay by the receiver circuits—will give the sweep oscillators two sets of pulses to try to keep step with, and jitter results. The remedy, of course, is antenna lead dress so that the housewife can't repeat her mistake.

### Antenna Test Precaution

Intermittent snow, flashing in the pix and crackling in the sound are often caused by a defect in the antenna system, but may also originate in the set. To determine whether the antenna system is at fault, the technician often disconnects the transmission line from the outdoor antenna at the set, and hooks up an indoor antenna in its place. If the symptoms persist with the test antenna, the cause is assumed to lie in the re-

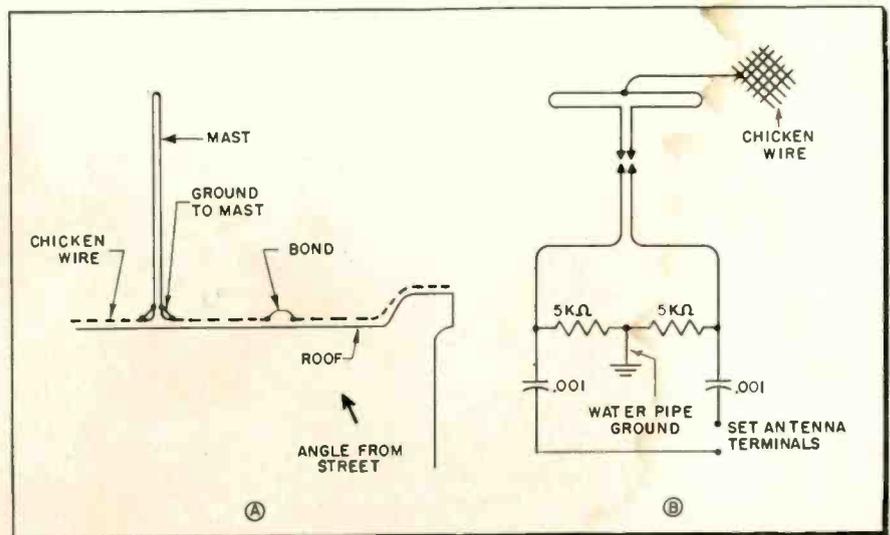
ceiver, which is then taken to the shop.

Look out! You can often be fooled into unnecessarily pulling a properly functioning chassis. Before you jump to any conclusions, make certain that the lead-in from the outdoor antenna is lying several feet away from the test antenna and its lead. If the two leads come close at any point, signal may be coupled from the outdoor antenna into the test antenna, and the symptoms can be thus induced in the set during the test, although the fault lies in the outdoor antenna! This effect has been observed more than once. Aside from the loss of time involved, there is always the problem of embarrassment over having made an error, loss of the customer's confidence, and possible loss of the customer.

Better be sure than sorry. Make certain that the roof-connected lead-in is well out of the way before you make observations.

*Hints on Ignition TVI and Reradiated Jitter were contributed by A. R. Clawson of Brooklyn, N. Y. The hint on the Antenna Test Precaution was submitted by John L. Mancini of Winthrop, Massachusetts.*

Fig. 1—Set-up for chicken-wire shield to keep ignition noise from street traffic out of set.



# Tuner Oscillator Tester

## Simple Bench Aid Speeds Critical Front-End Check

CLARENCE C. FULLER

• When tuner trouble is suspected, some method of determining just what the oscillator is—or isn't—doing is very desirable. Just replacing the tube itself doesn't tell a great deal if this procedure doesn't put the set back to work. Measurement of the injection voltage tells a great deal, but this is usually difficult to accomplish, especially if it is attempted with the chassis still in the cabinet. To determine the actual value of the excitation voltage, oscillation must be stopped momentarily. Accomplishing this is awkward. In UHF, particularly, tube replacement may tell very little.

The device described here will work without the need to disconnect any wires. All that is required is access to the B-plus lead to the plate of the oscillator, at some point between the B-plus dropping resistor and the plate load. Direct contact to the plate, of course, would upset oscillation when not desired.

The tester consists of 5 switch-selected resistive shunts that may be selectively inserted between oscillator B-plus and ground. As B-plus is progressively lowered or increased with the switch, effects upon oscillation and injection voltage are observed.

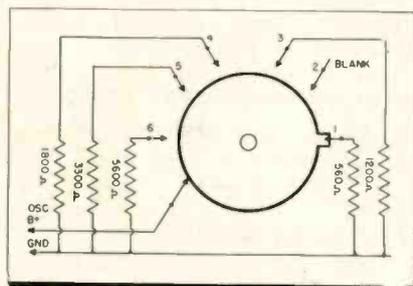
### Few Parts Required

Parts needed for the tester include 5 1-watt resistors, with one each of the following values: 560, 1200, 1800, 3300, and 5600 ohms. A switch with at least 5 positions is also needed; the one used in this case was a Centralab 1401 unit, with 6 positions. Also used were a pair of insulated leads, each 18 in. long; a pair of alligator clips; 1 wooden baseboard (2 in. x 3 in.); a panel for mounting the switch on the board; and a terminal strip.

The 560-ohm resistor was connected to the no. 1 terminal on the switch. Terminal 2 was left blank, with the 1200-ohm resistor connected to terminal 3. The 1800-, 3300-, and 5600-ohm resistors were connected respectively to the 4th, 5th and 6th switch terminals. The other

ends of these resistors are brought out to the terminal strip. One of the wire leads is connected to the resistors at the terminal-strip end; the other lead is connected to the permanent contact on the switch. The panel is then attached to the switch and mounted on the wooden base. Alligator clips are connected to the leads.

In use, one lead is connected to the oscillator B-plus end of the loading coil and the other to ground. If the tuner is of the UHF type that uses a crystal for a mixer, monitoring is



Circuit diagram of handy oscillator tester.

accomplished by measuring the voltage across the crystal. In most tuners, the voltage drop across this crystal is in the same range; if in doubt as to its value, however, consult the manufacturer's notes. Many tuners provide a test point for convenient measurement of this voltage drop. The Zenith UHF tuner is an example.

In the case of the Zenith tuner, which the writer has had occasion to examine with the tester, the voltmeter will give a reading somewhere between 0 and 0.2 volt at the test point. While the meter is still connected, switch the tester to the 560-ohm resistor. This will reduce plate voltage to the point where oscillation will stop. When the oscillator quits, there should be an increase of the voltage reading in the order of 0.1 volt. This rise indicates the excitation voltage. If the swing is much less than 0.1 volt, trouble is indicated.

Even if the tuner is working, a low value of excitation voltage indicates marginal performance, and perhaps intermittent operation. Try another tube and again make the tests. If no improvement results, something is

probably wrong with the crystal or associated circuits. If improvement is noted, additional tests should be made to see whether the new tube is likely to stay on the job. Tune the receiver to the highest channel available in the area and retest. Failures are more likely to occur in the higher channels.

### Progressive Checking

Switching to the 1200-ohm resistor will also usually stop oscillation. If it doesn't, above-average operation is being achieved and the tube is probably an exceptionally good one. With the 1800-ohm resistor in the circuit, the tube is definitely open to suspicion, if oscillation stops. Some tubes may even fail with the 3300-ohm or 5600-ohm resistor in the circuit. These should be discarded at once without further question, even though they appear to be operating properly with normal voltage. In difficult receiving locations, try to find a tube that will pass the 1800-ohm test. It can save many call-backs.

Although the figures given here were worked out with the Zenith tuner, the same pattern of testing can be applied to other front ends. Different values of resistance or different voltage levels at which oscillation should still be evident may have to be worked out. These values are readily determined by trial, as was done with the Zenith tuner.

In testing VHF front ends, procedure is pretty much the same, except that the test point is different; in these, the meter monitors the voltage at the mixer grid. Depending on the make of tuner, the value will range between -2.5 and -7.5 volts during oscillation. When the oscillator is stopped, this voltage practically swings to zero. As with the UHF tuner, the 560-ohm resistor will stop the oscillator in all cases. As for the value of shunt resistance with which oscillation should resume, the operator is better off establishing his own standards depending on the tuner make.

The device described is as handy in the customer's home as it is on the bench. •

# Let's Look At Circuits

## No. 4: The Noise-Inverter Sync Stage Improves Stability

SIDNEY C. SILVER, MANAGING EDITOR,  
TECHNICIAN

• Preceding the horizontal and vertical oscillators in the sync-sweep circuits of representative TV sets, we find a common sync strip of one or more stages. With the composite video signal as its input, this strip picks off or separates only the synchronizing pulses, for application to the oscillators, while rejecting video information. The sync stage shown here does just that, but it adds a flourish. It can tell the difference between true sync pulses and most noise pulses, thereby protecting the sweep oscillators from getting "fooled" by the wrong kind of information.

In separating or clipping pulses, the usual sync stage takes advantage of a characteristic of the composite signal: pulses and video intelligence appear at different levels. With the polarity for the signal shown at waveform A, for example (2 horizontal cycles), pulses are in the positive region, while video signal is relatively negative. If the separator is designed to conduct only on positive swings at the input, the output will show only sync pulses.

This very sensible arrangement, used in most receivers, works well until some interfering condition throws noise pulses into the video signal. If these noise pulses happen to have the same polarity as the sync pulses, and are equal or greater in

amplitude, they will pass right on through and may subversively trigger the oscillators, producing loss of sync.

The sync clipper shown in the accompanying schematic has an added feature that helps the stage distinguish between true sync pulses and noise spikes. In various forms, it has seen widespread incorporation in TV receiver design over the past couple of years. As shown here, the stage uses a pentagrid tube, similar in appearance to those functioning as converters in AM or FM receivers. The tube provides the advantage that it can accept two input signals at different grids, with the output depending on both of them.

The chief input, with pulses positive, enters at point A (from the plate of the video amplifier, in this case). At its other input, point B, the stage receives the same signal with two important differences. First of all, the amplitude of the signal, as indicated by the size of the arrow, is considerably smaller than that of its counterpart at the other grid. In the second place, as indicated by the direction of the arrow, its polarity is reversed. To fulfill these qualifications, waveform B simply need be picked off at a point one stage of amplification ahead of waveform A. It therefore comes from the input rather than the output of the video amplifier—or right from the video detector output.

The stage must be biased so that

the negative pulse tips of signal B almost (but not quite) drive the tube into cutoff at its first grid, as shown. During normal operation, then, the only effect of waveform B is to produce a slight degenerative effect on the tube's output, reducing it in amplitude. Should a large noise pulse occur, it will appear in both waveforms, A and B, at the same instant. Since its size will drive the stage to cutoff at grid B, the pulse is kept out of the output, shown as waveform C.

(Fine theory—maybe! What happens when a noise pulse not quite large enough to cut off the tube comes along? What happens if a noise pulse cuts off the tube during sync pulse time? For the answers, see the next installment of *Let's Look At Circuits.*)

### COLOR TV ON TAPE

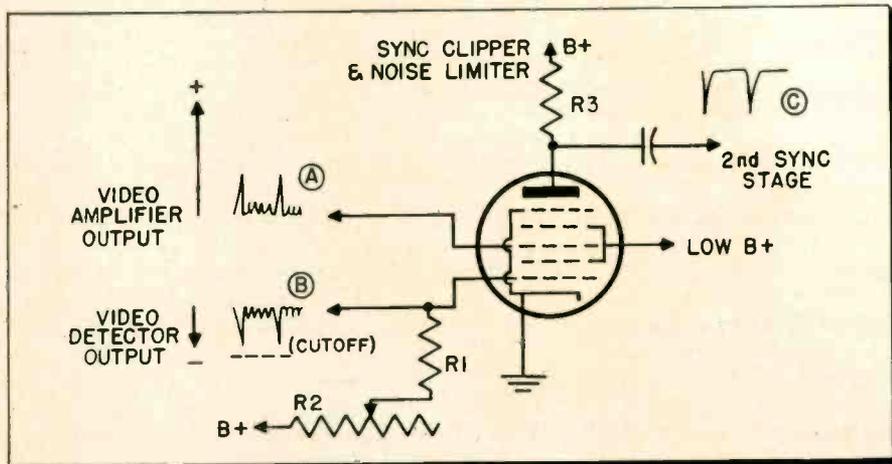
A cross country color telecast by video tape recording was shown to a group of the country's top industrialists recently when Minnesota Mining and Mfg. Co. dedicated its new Central Research building.

Both TV sound and picture came from a reel of magnetic tape, rather than from film or a live pickup. The demonstration was conducted by RCA. It originated in New York City and was transmitted by closed-circuit to Minneapolis' Foshay tower.

The 15-minute telecast represented years of research on 3M magnetic tape and on the highly complex RCA video tape recorder on which it was used. Previous demonstrations of video tape recording—called VTR—have been confined to laboratories only, or at the most, transmissions of a few miles. As a result, this cross-country video tape telecast is regarded as a milestone in a development that has been long-anticipated by the TV broadcasting industry.

In VTR, television industry leaders see answers to several of the problems which exist using conventional motion picture film, especially color: 1. Magnetic tape requires no chemical processing, offers immediate viewing; 2. Copies of tape recordings may be duplicated simultaneously from a master; 3. Tapes can be preserved indefinitely or may be electronically erased and re-used.

Pentagrid stage, using two inputs, passes true sync pulses but keeps noise spikes out.



# TECHNICIAN TEST EQUIPMENT CONTEST

Over \$2400 in instrument prizes will be given away to 106 winners!

Prize No.	Value	Instrument	Performance
1 <sup>st</sup>	\$348.00	HICKOK Model 650C Signal Tracer	Universal video generator for monochrome & color provides modulated r-f carrier for receiver injection; checks linearity and operation of video stages. Also produces white dots for color TV adjustment.
2 <sup>nd</sup>	\$329.50	WESTON Model 983 5" Oscilloscope	4.5 mc bandwidth; rise time 0.1 $\mu$ sec; deflection sensitivity 15 mv/in; phase shift between H & V amps, 0° to 100 kc, 2° to 1 mc; calibrating voltages 0.5, 5, 50, 500; Z-axis modulation input; sweep freq. 10-500,000 cps variable.
3 <sup>rd</sup>	\$269.50	HYCON Model 617 3" Oscilloscope	4.5 mc bandwidth; V-amp sensitivity 0.1 v/in; sweep ranges 15 cps to 100 kc; TV V & H freq. 60 cps, variable phase; calibrating voltages 0.05, 0.15, 0.5, 1.5, 5.0, 15, 50, 150; H amp sensitivity 0.075 v/in.
4 <sup>th</sup>	\$139.85	TELETEST FT100 Flyback Tester, RT203 Rejuvenator, CT355 Capacitor Tester	FT100 (\$44.95) Tests flybacks under full operating voltage, tests yokes and coils for shorted turns. RT203 (\$49.95) tests and reactivates crt. CT355 (\$44.95) tests for leakage, measures capacity from 10 $\mu$ mf to 50 $\mu$ f.
5 <sup>th</sup>	\$126.50	SUPREME Model 655 5" Oscilloscope	V amp freq. response 20 cps to 100 kc; deflection sensitivity 0.3 v/in. H. amp freq. response 20 cps to 75 kc; sensitivity 0.3 v/in. Will handle 60 cps square wave. Sweep oscillator range 20 to 30,000 cps.
6 <sup>th</sup>	\$120.00	CLOUGH-BRENGLE Model 411 Audio Oscillator	20 cps to 1000 kc in five ranges; accuracy 2% plus 1 cycle from 20 cps to 200 kc, 3% 200-1000 kc; output 10 v open circuit; distortion under 1%; output hum less than 5 mv @ max. output, 0.1 mv on LO.
7 <sup>th</sup>	\$104.70	JACKSON Model 49 Tube Tester & Accessories	Tester (\$49.95) has 5" meter. Accessories include plug-in kit (\$2.95), high resistance shorts tester (\$6.95), filament current tester (\$14.95), selenium rectifier tester (\$17.95), auxiliary tube socket kit (\$11.95).
8 <sup>th</sup>	\$99.95	AUTHORIZED Model 204 Intermittent Analyzer	Input ac or dc either polarity; range monitored 0.5 to 575 v; % voltage change for actuation, adjustable 5 to 65%; response time 0.02 sec; indication is pilot and/or buzzer; 4 1/2 in. meter; self-balancing.
9 <sup>th</sup>	\$99.50	TELEVISION ENGINEERS Model V1000A Tube Checker	"Vis-U-All" tester lists over 300 popular tubes on chart; filament voltage 1.5 to 117 v; five tube sockets; interelement leakage test for less than 3.5 meg; weight 10 lbs.
10 <sup>th</sup>	\$97.50	RADION Model FSM500 Field Strength Meter	VHF-UHF battery portable covers channels 2 through 83, including FM bands. Relative and direct readings in $\mu$ v. Measures radiation, lead-in SWR; locates interference.
11 <sup>th</sup>	\$89.50	RAYTRONIC Model CB-77N "Beamer"	Portable unit tests crt's for element continuity, shorts, leakage, emission, gas content. Repairs crt's by cathode sweeping, burning off interelement shorts, expanding aperture. Weight 12 lbs.
12 <sup>th</sup>	\$69.50	ELECTRONIC TEST INSTR. "Vitameter"	Portable unit tests crt's for continuity, shorts, beam current, gas content. Repairs crt's shorts, vitalize cathode, welds open filaments and cathodes. Weight 10 lbs.
13 <sup>th</sup>	\$68.90	SECO FB-4 Flyback and GCT5 Tube Testers	FB-4 (\$38.95) measures flyback retrace time interval; also tests yokes, transformers. GCT5 (\$29.95) grid circuit tube tester checks control grid emission, gas, shorts.
14 <sup>th</sup>	\$68.00	SHASTA Model 201 VTVM	DC: 11 meg input; 7 ranges to 1500 volts; accuracy 3% full scale. AC: input to 1.5 meg; 7 ranges to 4000 v; accuracy 5%; 7 resistance ranges to 1000 meg.
15 <sup>th</sup>	\$50.35	RADIO CITY Models 480 & 453 Multitesters	Model 480 (\$14.85) ac & dc to 1000v; 1000 ma dc; ohms to 10 meg; db —8 to 55. Model 453 (\$35.50) 20,000 ohms/v; dc to 5 kv; 100 $\mu$ a; to 500 ma. 20 meg; 1 kv ac; db —12 to 55.
16 <sup>th</sup>	\$29.95	SIMPSON Model 355 "Midgetester"	Dimensions 2-2/3 x 4-1/2 x 1 in. AC & DC voltages to 1200 v in 5 ranges @ 10,000 ohms/v; resistance to 10 meg in 4 ranges. Accuracy 3% dc, 5% ac. Weight 7 oz.
17 <sup>th</sup>	\$25.00	VIDAIRE Model FT-100 Wave Trap Meter	Unit quickly determines type of filter or trap to use in any TV installation by switching filter into ac or antenna circuits simultaneously.
18 <sup>th</sup>	\$24.50	HEATH Model V-7 VTVM Kit	7 dc voltage ranges to 1500 v; 7 ac ranges to 4000 v ac; ohms x 1 meg in 7 steps; 4 1/2 in., 200 $\mu$ a meter; 11 meg input impedance; dc polarity reversing switch.
19 <sup>th</sup>	\$19.95	CENTURY Model 201 Condenser-Resistor Analyzer	Tests condensers from 50 $\mu$ mf to 150 $\mu$ f for leakage to 10 meg; shorts, opens, intermittents; resistors from 1500 ohms to 10 meg; coupling condensers without disconnect.
20 <sup>th</sup>	\$19.95	RADIO KITS Model M-3C Multitester Kit	Volts ac-dc to 1500 v in 5 ranges; ma dc to 150 in 3 ranges; ohms to 200,000 in 3 ranges. 1000 ohms/v sensitivity. 3" meter.
21 <sup>st</sup>	\$19.95	TELEMATIC Model WT606 TVI Analyzer	Calibrated condenser tuning identifies interfering frequencies. Wave traps and filters operate singly or in combination.
22 <sup>nd</sup>	\$18.28	POMONA Socket Kits & Meter Switch	"Socket saver," test adapter, surface board socket kits for 7, 8, 9 pin tubes. MS-1 meter reversing polarity switch.
23 <sup>rd</sup>	\$15.85	SUPERIOR Model 770A VOM	AC voltage to 3 kv in 6 ranges. DC voltage to 1500 v in 6 ranges. Resistance to 1 meg in 2 ranges. Current to 15 a dc in 3 ranges.
24 <sup>th</sup>	\$14.90	ELECTRONIC MEASUREMENTS Model 102 Multitester	EMC "Volometer" measures ac & dc voltages to 3 kv in 5 ranges; current to 600 ma in 3 ranges ac, to 1.2 a dc in 4 ranges. Resistance to 1 meg.
25 <sup>th</sup>	\$9.95	BERKSHIRE Model 18 "Labstrobe"	Provides 60 flashes/sec operating from 60 cps power line. For measuring motor and turntable rotation.
26 <sup>th</sup>	\$8.50	ALCO Model R20 Resistor Substitution Box	Rapid substitution of resistors from 10 ohms to 10 meg in multiples of 10, 27 and 47 ohms.
27-31 <sup>st</sup>	\$3.95 <sup>ea</sup>	SUPEREX CRT Adapter	CRT tube tester adapter permits measurement of pix tubes with present tube testers.
32-56 <sup>th</sup>		GENERAL ELECTRIC Series Heater Checkers	Checks pix tube heaters and 7, 9 and octal base tubes in series string receivers with no external connections.
57-81 <sup>st</sup>		RCA "Multicords"	All-in-one power cord with two types of cheater receptacles, power outlet, clamp-on work light.
82-106 <sup>th</sup>		CBS-HYTRON Four-Way Tools	Tool with Phillips and standard screwdrivers and 2 hex sockets aids removal of setbacks.

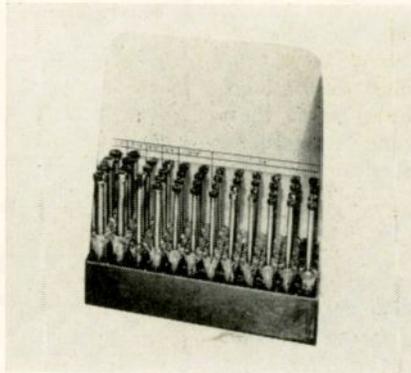


# Progress in New Products

## IRC NUT DRIVERS



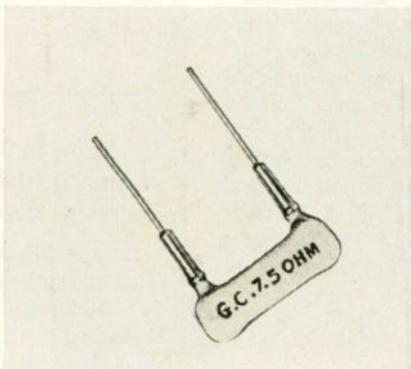
Tension-Grip Nut Holding Nut Driver, ideal for close work starting or removing, has tempered steel band that grips nut or hexagon head screw automatically as it enters socket. "Tension-grip" has spring action and is non-magnetic. Nut driver shaft is set in shock-proof plastic handle. Available individually in six sizes: 1/4", 5/16", 11/32", 3/8", 7/16", 1/2", or in an attractive 48 unit counter display. International Resistance Co., 401 North Broad St., Philadelphia 8, Pa.—TECHNICIAN (Ask for No. 10-70)



## GC FUSE RESISTOR



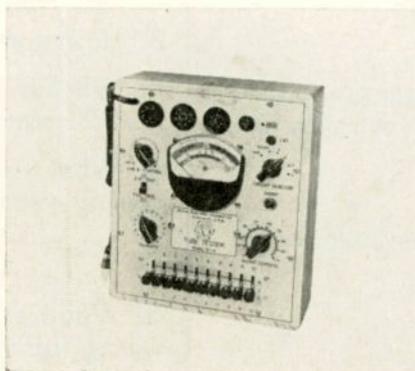
Now available is a 7.5 ohm TV fuse resistor, which is designed for replacement on any series-wired TV set by such makers as Motorola, RCA, Crosley, Hoffman, Zenith, Admiral, Raytheon and Sylvania. Tinned wire leads are supplied plus male plug-in terminals for use with a mounting strip. The "G-C 7.5 Ohm Fuse Resistor" (Catalog No. 9207) is individually packaged and lists for \$0.55 (net \$0.17). General Cement Mfg. Co., 919 Taylor Ave., Rockford, Ill.—TECHNICIAN (Ask for No. 10-71)



## GEE TUBE TESTER



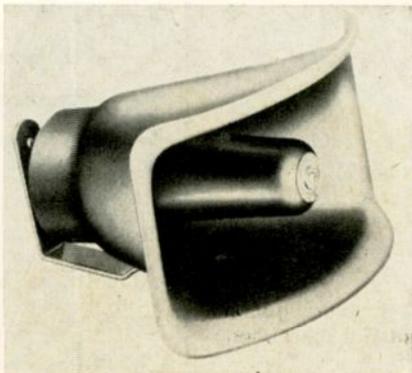
Tube Tester Kit 327A at \$33.95 has double fuse protection for both meter and transformer. Manufacturer claims tester provides for reactivating picture tubes, testing for shorts and leakages, testing hearing aid, magic eye, receiving tubes, etc. Loose-leaf book with indexed tab tube chart cards gives tube data. New cards with tube test data for new tubes can instantly be inserted in proper place. General Electronic Equipment Co., Mantua & Glendale St., Easton, Pa.—TECHNICIAN (Ask for No. 10-72)



## Atlas P. A. SPEAKER



Model CJ-14 Cobra-Jector for paging, talk-back, intercom, industrial, marine and mobile applications, provides a wide angle of dispersion for effective coverage of areas of high noise level, adverse wind conditions, etc. Fiber glass construction of the main flare assures lifetime durability under all climatic conditions. Input power: 5 watts; input impedance—8 ohms; response—400 to 9000 cps; dispersion—120° to 60°. Atlas Sound Corp., 1451 39th St., Brooklyn 18, N.Y.—TECHNICIAN (Ask for No. 10-73)



## Sylvania TUBES

Tube type 6CS7 is a miniature 9-pin, medium mu, dual triode with dissimilar sections, and is suitable for vertical deflection and oscillator applications using conventional transformer supply voltages. Output section has plate dissipation rating of 6.5 watts. Other triode section is for service as an oscillator, detector or amplifier. Tube is also designed for series string or conventional parallel operation. The 25DN6 is a beam power pentode rated for TV service as a horizontal deflection amplifier and was designed particularly for use in "off-the-line" series string sets utilizing low B+ voltages. Sylvania Electric Products, Radio Tube Div., 1740 Broadway, New York 19, N. Y.—TECHNICIAN (Ask for No. 10-74)

## Utah AUTO SPEAKERS

Automotive rear deck sound systems and controls, featuring ease of installation and simple operation, includes three complete, rear deck auto kits, the "RT" Series, "RQ" Series and the "RF" Series. These kits are available complete with either a 5" x 7" or 6" x 9" speaker, control panel, control knob, hardware and wire for installation, mounting ring and grill to match and blend with any car interior. Utah Radio Products Co., Inc., 1123 East Franklin St., Huntington, Ind.—TECHNICIAN (Ask for No. 10-75)

## FES COUPLER

"Bi-Fi 2-Set Antenna Coupler" for TV or FM featuring printed circuit bifilar coils, is designed to operate two TV or FM sets from a single antenna. The Bi-Fi can also be used to operate simultaneously one TV and one FM set from the same antenna. This unit is mounted within a durable, transparent polystyrene plastic case. Federal Electronics Sales, Federal Electronics Bldg., Rockville Center, N.Y.—TECHNICIAN (Ask for No. 10-76)

## Clarostat "PICK-A-SHAFT"

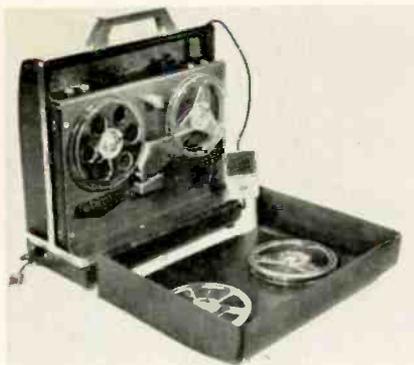
Another field-attached "Pick-A-Shaft" shaft, FKS-1/2, similar to FKS-1/4 or fine knurled slotted shaft, is 1/2" long instead of 1/4". There are now thirteen types to choose from, plus the high-voltage coupler for protection in operations up to 10 kv. Clarostat Mfg. Co., Inc., Dover, N. H.—TECHNICIAN (Ask for No. 10-77)

For more technical information, use inquiry coupon on page 60

# New Audio Products

## Raytronic TAPE RECORDER →

Light weight portable tape recorder, the "Melatone," resembles expensive luggage. It weighs 14 lbs., 12 oz., and offers excellent tonal quality. Features include single one knob control for rewind, fast forward or playback, with full stop and pause positions. Speeds are  $3\frac{3}{4}$  and  $7\frac{1}{2}$  ips. Side jacks for outside speaker. Melatone can be operated with lid open or closed. Retail price \$149.50. Raytronic Laboratories, Inc., 9701 Reading Rd., Cincinnati 15, Ohio—TECHNICIAN (Ask for No. 10-9)



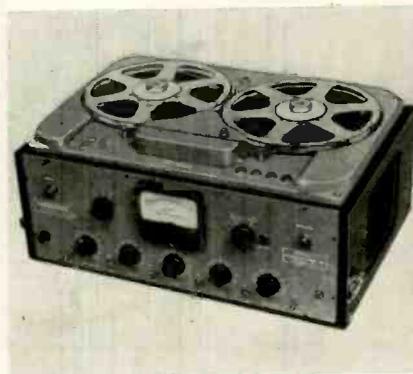
## Bell TAPE RECORDER →

New portable battery-powered dual track tape recorder, the Cub-Corder, will record for 1 hr. at  $3\frac{3}{4}$  ips or 30 minutes of recording at  $7\frac{1}{2}$  ips on a single 5-inch 600-ft. reel of tape. The  $7\frac{1}{2}$  ips speed provides a wide frequency response. The machine is also available with capstans for  $1\frac{7}{8}$  ips and  $3\frac{3}{4}$  ips and using the new long playing tapes at  $1\frac{7}{8}$  ips it will record three hours. Utilizes rechargeable non-spill wet battery. Bell Sound Systems, Inc., 555 Marion Rd., Columbus 7, Ohio—TECHNICIAN (Ask for No. 10-86)



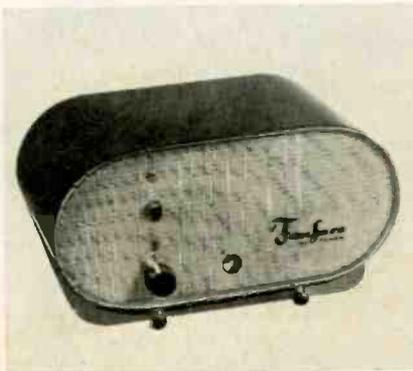
## Premier TAPE RECORDER →

Portable professional-type tape recorder, the "Tapesonic" model 70-B offers these features: three separate heads to provide instantaneous monitoring from tape while recording; A. B. switch which permits comparison between original and recorded program;  $4\frac{1}{2}$ -in VU meter; push button operation—using 7 electrically interlocked D. C. relays and 1 solenoid. It has an 8-in. extended range speaker. \$368.50 net. Premier Electronic Laboratories, 382 Lafayette St., New York 3, N. Y.—TECHNICIAN (Ask for No. 10-85)



## Fanon INTERCOMS →

The FX-12 or "Manager" unit may be used either for one master with up to eleven remotes or in an all master service with up to 12 masters in a hook up by a flick of a switch. New cabinet styling. Cabinets rest on graceful brass legs. They are of hammertone finished steel with perforated front grilles of contrasting colors to match any modern or traditional interior. Measurements:  $3\frac{1}{2}$  in. high x 8 in. long x 4 in. deep. Fanon Electric Co., Jamaica, N. Y.—TECHNICIAN (Ask for No. 10-84)



## Shure CERAMIC CARTRIDGES

"Twin-Lever" ceramic phono cartridge can be used to replace 132 3-speed, plastic-cased, ceramic and crystal, turnover and single-needle cartridges for high quality 78 rpm and microgroove response. Also announced is a ceramic cartridge (which is furnished with a magnetic input adapter) designed to enhance the quality of popular hi-fi equipment. The "Music Lovers" cartridge eliminates the problem of induced hum, eliminates cartridge "drag" caused by magnetic attraction to steel turntables, has high output, and relative response is not affected by load resistance. Needle replacement requires no tools. Shure Brothers, Inc., 225 W. Huron St., Chicago 10, Ill.—TECHNICIAN (Ask for No. 10-10)

## Daystrom TAPE RECORDER

The "Crestwood," Model 404, is a magnetic tape recorder-preamplifier only which will record from and playback through high quality audio amplifiers and speaker systems. The 404 incorporates the fine features of its predecessor, Model 401 and offers a completely new tape transport mechanism with smooth belt drive and "Non-Vibro" motor mounts which results in vibrationless, noise-free operating drive. Full hi-fi response of 30 to 15,000 cycles at  $7\frac{1}{2}$  ips. Push-pull speed changer provides instantaneous selection of  $7\frac{1}{2}$  ips or  $3\frac{3}{4}$  ips. Completely new preamplifier holds distortion to less than 2%. All tubes are shock mounted. Signal-to-noise ratio 40 db or better. \$229.50. Daystrom Electric Corp., Poughkeepsie, N. Y.—TECHNICIAN (Ask for No. 10-82)

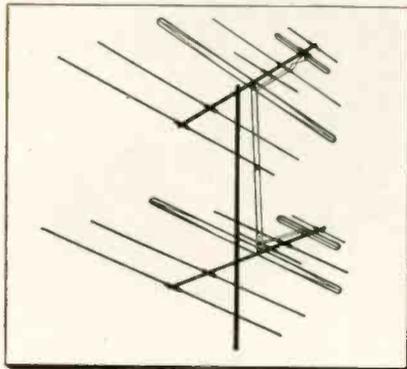
## Brociner AMPLIFIER

New Mark 10 Intergrated Audio Amplifier includes in one housing a power amplifier, bass and treble tone controls, selector switch, record compensator and phonograph preamplifier. It is suitable for use with AM, FM and TV tuners, all types of high-quality phonograph pickups, and for tape recording and playback. A simplified record compensator affords convenient selection of record equalization and includes a special provision for noisy records; a rumble filter controlled from the front panel permits the use of record changers, without background noise. Frequency response is 20-20,000 cps, within 1 db. Power output is 10 watts at less than 1% harmonic distortion. 3 db. undistorted power 50-20,000 cycles. \$75.00 Brociner Electronics Laboratory, 344 E. 32 St., New York 16, N. Y.—TECHNICIAN (Ask for No. 10-83)

# New Antenna Products

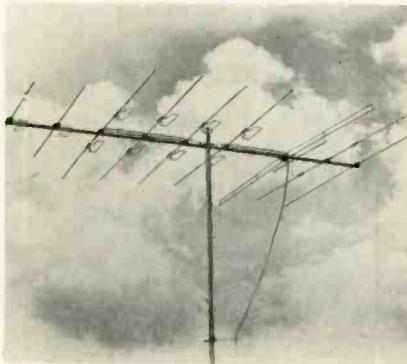
## JFD FRINGE ANTENNAS →

Two new Fireball inline broad-band antennas, FB500S-68 and FB500S-96, are designed for deep fringe VHF-UHF use. The FB500S-68 2-bay model uses the reverse-phase multiplex dipole system of the Fireball FB500, is tailored for areas with co-channel and cross-channel interference. Stacking harness increases back rejection on high channels by 8 db. The FB500S-96 with low-band boost stacking transformers increases gain on 2 to 6. JFD Mfg. Co., Inc., 6101 16th Ave., Brooklyn 4, N. Y.—TECHNICIAN (Ask for No. 10-60)



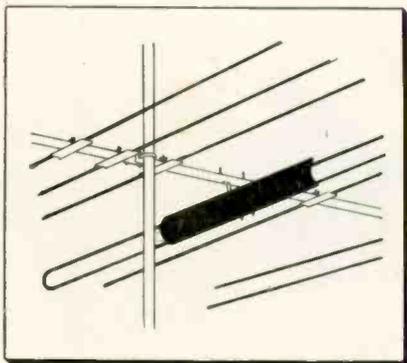
## Channel Master ANTENNAS →

The Lancer and Super Lancer, all-channel VHF antennas, are said to provide more elements and more power than similar types. The Lancer (model 333) has 1 added low-band director, gives 1½ db more low-band gain. The Super Lancer (model 334) has 4 additional parasitic elements, it gives 1½ db more gain. The Lancer lists at \$18.20 (1-bay) model 333; and \$37.50 for model 333-2, (2-bay). Super Lancer lists at \$32.50 (1-bay), model 334. Channel Master Corp., Ellenville, N.Y.—TECHNICIAN (Ask for No. 10-61)



## Walsco FRINGE ANTENNAS →

The Wizard is an improvement over yagi design, using the exclusive Phase Reverser, a specially shaped, shield in front of the receiving element. Unit functions as 3 antennas for coverage on high and low channels. No complicated harnesses, phasing stubs, and extra dipoles. A 3-year guarantee goes with each Wizard model. List prices are as follows: Wizardette \$14.90; Wizard \$19.50; Wizard Imperial \$34.90. Technical data available. Walsco Electronics Corp., 3602 Crenshaw Blvd., L. A. 16, Calif.—TECHNICIAN (Ask for No. 10-63)



## Thompson ROTATOR →

The electronic "Automatic Superotor" eliminates spring or gear mechanisms in the control unit. Only 7½" wide, 4½" deep, 2½" high, and including an automatically illuminated dial, it is reported silent in operation. Features include synchronized control and rotor units; smooth rotation without "jumps"; vernier tuning, removable power unit, and a choice of either of two interchangeable rotator units. Thompson Products, Inc., 2196 Clarkwood Rd., Cleveland 3, Ohio—TECHNICIAN (Ask for No. 10-62)



## B-T MATCHING TRANSFORMERS

Two impedance matching transformers include the MB Balun, an outdoor model for antennas or amplifiers, and the TM TV Set Match which mounts directly on the receiver. Both provide 75 to 300 ohm match over VHF range. The MB features a weather shield and bracket with strap for mast or pole mounting, improves directivity of 300-ohm balanced antennas when connecting to 75 ohm cable, increases antenna pickup. List price is \$8.00. Model TM mounts on back of TV set to match 75 ohm input cable to 300-ohm receiver. List price, \$3.25. Blonder-Tongue Laboratories, Inc., 526-536 North Ave., Westfield, N.J.—TECHNICIAN (Ask for No. 10-65)

## J&L MAST TUBING

New antenna masting enables a TV tech to assemble telescoping masts in heights up to 50 ft. Perma-Tube is available in 5 sizes, all in 10 ft. lengths. Sections range, in ¼-in. gradations, from an outside diameter of 2¼-in., to the smallest with an OD of 1¼-in. The 2-in. size fits inside the 2¼-in. size, and so on. Sections have one end expanded, the other reduced. Slots and holes receive hardware fittings. Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.—TECHNICIAN (Ask for No. 10-67)

## Finco TV ANTENNAS

Geomatic series for all-channel VHF includes 2 models for deep fringe use. B-4 provides high gain and sharp directivity; has low-band reflector and ½-wave director; hi band has 3-elem. reflector and 2 3-elem. colinear directors. Model B-5 uses multiple directors and reflectors, other combination elements; is said to provide single-channel tuned yagi performance across all channels. Finney Co., 4612 St. Clair Ave., Cleveland 3, Ohio—TECHNICIAN (Ask for No. 10-64)

## Kay-Townes TV ANTENNA

The Super Rear Guard was designed to have less than 1 db drop across any one channel, to facilitate color reception in fringe areas. The front-to-back ratio, important in eliminating co-channel interference, is stated to be better than 25-to-1. Excellent rejection of signals from the sides is also reported for this highly directive design. Kay-Townes Antenna Co., Rome, Ga.—TECHNICIAN (Ask for No. 10-66)

For more technical information on new products, use inquiry card on page 60



He's proving Pyramid Imps are better!

These molded paper tubular capacitors are smaller and better; will operate at full rated voltage at 100°C with less than 2% change in capacitance; will meet test requirements of Government specifications MIL-C-91A; copperweld leads are securely imbedded.

These features, plus an almost indestructible thermo-setting plastic encasement make Pyramid Imps your best molded paper-tubular capacitor.

For full information on Pyramid capacitors and rectifiers, see your local distributor or write to

DISTRIBUTOR DIVISION

**PYRAMID**  
ELECTRIC CO.

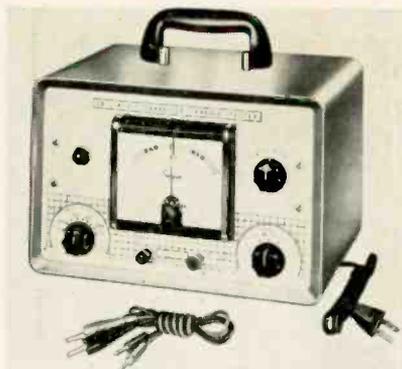
1445 Hudson Blvd., North Bergen, N. J.



# Latest Test Instruments

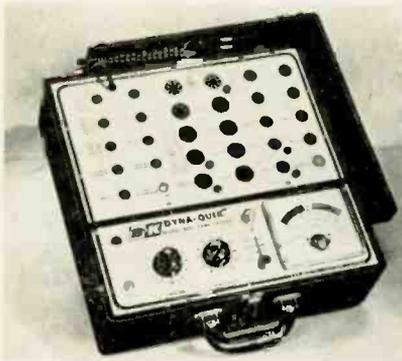
## Simpson CAPACITOR TESTER →

In-Circuit Capacitor Leakage Tester, Model 383, shows leakage in capacitors while connected in the circuit. It checks capacitors from 1  $\mu\text{f}$  to 0.25  $\mu\text{f}$  for leakage from a few ohms to hundreds of megohms, and detects breakdowns and intermittents. Checking is done at full rated working voltage. Capacitors under test can be shunted by circuit resistance 1% of leakage resistance. It checks coils and detects unstable resistors. Price is \$79.95. Simpson Electric Co., 5200 Kinzie St., Chicago 44, Ill.—TECHNICIAN (Ask for No. 10-1)



## B & K TUBE TESTER →

Dyna-Quik Model 500, a portable, low cost, dynamic mutual conductance tube tester, tests for shorts, grid emission, gas content, leakage, dynamic mutual conductance and life expectancy for 99% of all tubes in as little as 12 seconds per tube. Roll charts and multiple switching are not required as one switch tests everything. Tube condition is shown on a 4½ in. meter "Good-Bad" scale and directly in micromhos. B & K Manufacturing Co., 3726 No. Southport Ave., Chicago 13, Ill.—TECHNICIAN (Ask for No. 10-3)



## Triplett DOT GENERATOR →

Dot generator, Model 3438, checks video, r-f, i-f sync and color circuits, with modulated r-f (channels 2 to 6) and i-f (20 to 55 mc) outputs, and sync pulses (15,750 and 60 cycles). Other features include: Horizontal bars (480 to 600 cycles) and vertical bars (189 kc) for checking linearity. White dots are used to check color convergence. Can be used for signal tracing b/w or color TV sets. Dealer net is \$229.50. Triplett Electrical Instrument Co., Bluffton, Ohio.—TECHNICIAN (Ask for No. 10-4)



## Hycon COLOR GENERATOR →

Adjusting and trouble shooting color TV receivers is simplified with Model 616 Color Bar/Dot Generator. Every color sequence and linearity adjustment necessary is available. Color Band "A" is the complete NTSC. Band "B" has 4 bars. Band "C" consists of black, I, Q, black. Quadrature signals are held within 1°. For linearity adjustments, black vertical or horizontal bars or a black crosshatch pattern are available. Price \$415. Hycon Mfg Co., 365 S. Arroyo Pkwy., Pasadena, Calif.—TECHNICIAN (Ask for No. 10-2)



## Century RC ANALYZER

Checking all coupling and most bypass condensers without disconnecting them from the circuit is possible with Model 201 Condenser-Resistor Analyzer. The unit, completely self-contained, checks condensers from 50 uuf to 150 uf for leakage (up to 10 megohms) as well as open, shorted or intermittent operation. Unknown capacity values are also quickly registered in one complete range on the clearly calibrated dial. Also, the 201 will test resistors from 1500 ohms to 10 megohms for shorted, open or intermittent operation and show up unknown resistance value in one complete range. Price is \$19.95. Century Electronics Co., 111 Roosevelt Ave., Mineola, L.I., N.Y.—TECHNICIAN (Ask for No. 10-6)

## Philco VTVM

Model 6100 vacuum tube voltmeter has six voltmeter ranges which permit ac and dc voltage measurements up to 1,000 volts. Six resistance ranges give accurate readings from 0.5 ohms to 1,000 megohms. Ac frequency range extends from 20 to 20,000 cycles. It is also available with an accessory high voltage probe, Part No. 425-002, which permits measuring dc voltages to 30,000. Model 6100 is in a steel case, weighs 5½ lbs., and its size is 8½ x 5 11/16 x 4 inches. Dealer price is \$54.95. Philco Corp., Accessory Div., Philadelphia 34, Pa.—TECHNICIAN (Ask for No. 10-5)

## Tescon CRT REJUVENATOR

New instrument, known as the Golden Vitalizer, Model RT-1, will analyze performance characteristics of a cathode ray tube, locate and eliminate inter-element shorts, repair open elements, weld upon filaments, rejuvenate the tube so that it will function satisfactorily for additional time, and will do all this without removing the tube from the set. A neon indicator automatically lights up when the rejuvenation process is completed. Tescon, Inc., Springfield Gardens, N.Y.—TECHNICIAN (Ask for No. 10-7)

## Dunwell TEST SPEAKER

New portable low priced test speaker, Model A6, equipped with specially designed universal test leads, provides simple audio test for any TV, radio receiver or phonograph. Tip jacks connect to 4" PM speaker, universal output transformer, 60 ohm field and 90 ohm field. Weight is 6 lbs. Dunwell Mfg. Co., Carlstadt, N.J.—TECHNICIAN (Ask for No. 10-8)

For more technical information on new products, use inquiry card on page 60

# FIELD REPORT NO. 6

**ROSAIRE RUY**  
MAGOG ORFORD TV  
MAGOG, QUE., CANADA  
*The JFD Fireball is one TV antenna I don't hesitate to recommend no matter how hopeless the situation. It helps get rid of troublesome ghosts, at the same time it feeds a strong steady signal to the receiver.*

**DON ALBERTSON**  
TELEVISION - APPLIANCE  
FERGUS FALLS, MINNESOTA  
*I like and use the Star-Helix because I saw for myself how good on channels 2-13 it is. I tried 4 of the best broad-band fringe antennas during the last year. When I compared the TV picture I got from the Star-Helix, you could see the difference. The Star-Helix brought in the best picture.*

**EARL A. BERGEROW**  
EARL'S TV ANTENNA SERVICE  
HOUMA, LOUISIANA  
*We've waited a long time for an antenna like this. My customers like the sharp pictures it gives them. In and around Houma, Louisiana, we receive clearly with a Star-Helix antenna channel 6 from New Orleans, channel 2 from Baton Rouge, channel 7 from Lake Charles, and channel 10 from Lafayette.*

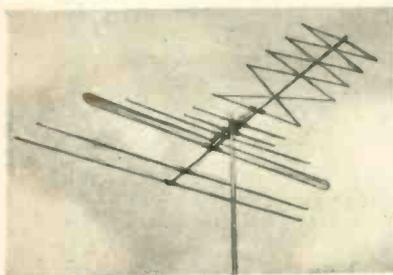
**HILLIARD A. THIBODEAUX**  
BABIN APPLIANCE CO.  
CROWLEY, LOUISIANA  
*After trying several types of antenna in this area we decided on the Star-Helix Antenna because of its high gain and noise-free picture reception giving us more satisfied customers.*

**BEN CIPOLLA**  
AMCO TV and RADIO LAB.  
BROOKLYN, NEW YORK  
*Here in Boro Park ghosts give us lots of headaches. The JFD Fireball is the first antenna we've tried that really helps get rid of them. My customers like the clearer picture. My crew likes the way they install easier.*

**FOY T. HINSON**  
RADIO SERVICE  
KANNAPOLIS, NORTH CAROLINA  
*We have used the Fireball antenna single stacked and found it to out-perform antennas costing as much and in some cases much more. The Fireball is one of the easiest antennas to install. In all a very good antenna for the money.*

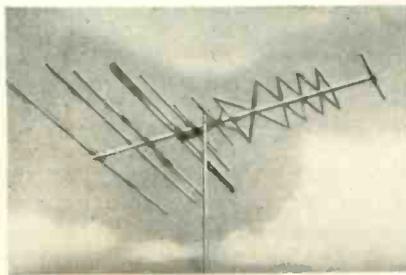
## First Choice of Servicemen Everywhere!

In area after area, alert servicemen are standardizing on JFD antennas. They know that regardless of location or budget there is a JFD antenna that does a *better*, more profitable job. Now is the time to put JFD engineering and promotion leadership to work for you building sales and customer confidence.



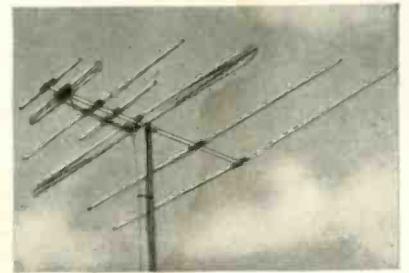
### JFD STAR-HELIX

<b>SX711</b>	single	<b>\$25.50</b>
<b>SX711S</b>	stacked	<b>\$52.50</b>
<b>SX711S-96*</b>	96" stacked	<b>\$55.00</b>



### JFD SUPER-STAR HELIX

<b>SX13</b>	single	<b>\$35.00</b>
<b>SX13S</b>	stacked	<b>\$72.50</b>



### JFD FIRE-BALL

<b>FB500</b>	single	<b>\$17.35</b>
<b>FB500S</b>	stacked	<b>\$36.65</b>
<b>FB500S-68†</b>	68" wide stacked	<b>\$36.65</b>
<b>FB500S-96*</b>	96" wide stacked	<b>\$38.60</b>



*"Go Forward with JFD Engineering."*  
MANUFACTURING Co. Inc., BROOKLYN 4, N. Y.  
INTERNATIONAL DIVISION, 15 MOORE ST., N. Y.

†for areas with co-channel and cross-channel interference

\*for added channel 2-6 gain



# TRIO®

**Will Not Sacrifice Quality  
FOR PRICE!**

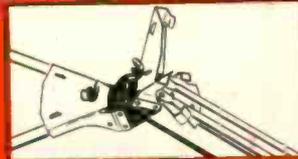


TRIO  
Model 747

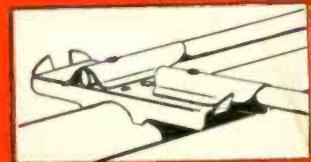
*Sharpshooter*

CONICAL

**\$3.95**  
LIST



Insta-Lok Head—216% more resistance to vibration and breakage. Flip out elements—they're locked in place.



Insta-Lok Clamp—Swing elements into position—that's all!

**14**

POPULAR MODELS  
—ALL COMPLETELY  
PRE-ASSEMBLED

Quality materials plus advanced TRIO automation give you the finest conicals ever built.

*Sharpshooter's Quality Features  
Obsolete Un-assembled Antennas*

TRIO

*Sharpshooter*

YAGI

**DRAW A BEAD ON QUALITY**



Only TRIO SHARPSHOOTER  
Yagis Have These  
Quality Features

5 ELEMENT  
(CHANNEL 6)

**\$7.45**  
LIST

5 ELEMENT  
HIGH BAND

**\$3.95**  
LIST

**INSTA-LOK CLAMPS**—Perfect alignment, positive lock, superior strength, lessened vibration and breakage. No finer yagis regardless of price!

**EFFICIENT ELECTRICAL DESIGN**—TRIO high channel models use a ratio type d pole for better impedance match, higher gain, sharper directivity.

**RIVETED CONSTRUCTION**—Introduced by TRIO for faster assembly, better picture quality.

**BETTER VALUE**—Because TRIO produces practically every part used in their products, including their own aluminum tubing.

Ask your distributor for complete literature on the new SHARPSHOOTER Conicals and Yagis.

10 ELEMENT  
(CHANNEL 6)

**\$13.65**  
LIST

10 ELEMENT  
HIGH BAND

**\$6.88**  
LIST



**TRIO®** Manufacturing Company  
GRIGGSVILLE, ILLINOIS

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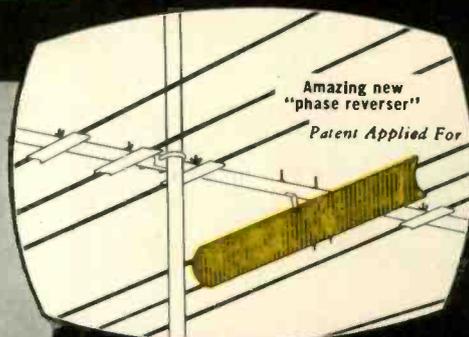
EXPORT SALES DIV., SCHEEL INTERNATIONAL INC., 4237 N. Lincoln Ave., Chicago, U.S.A. Cable Address: HARSHEEL

# EXCLUSIVE "PHASE-REVERSER" GUARANTEES

## THE NEW WALSCO WIZARD

### THE MOST ADVANCED, MOST POWERFUL

### SUPER FRINGE ANTENNA



Amazing new  
"phase reverser"  
Patent Applied For

### IN THE WORLD

*here's positive proof!*

Actual comparison  
of fringe antenna performance

Channels	Gain (db) Single Bay						
	2	4	6	7	9	11	13
Walsco Wizard Imperial	6.1	6.9	8.2	11.9	11.6	10.8	12.6
Antenna "A" With 3 Phase Reversing Dipoles	6.3	6.6	8.1	10.5	10.2	10.6	12.4
Antenna "B" - Yagi Type with Phasing Loops	5.1	5.5	6.8	7.5	9.6	8.8	11.2
Antenna "C" - Yagi Type with Loading Coils	5.9	6.9	8.6	9.1	8.6	9.6	7.8

The new Walsco Wizard performs as 3 separate antennas combined in one to give the very finest, all-channel picture reception ever seen on any television screen. Extra dipoles, complicated harnesses, or phasing stubs are completely eliminated. And the Wizard is the easiest to assemble and install.

Walsco guarantees the Wizard for 3 years.

Model	Price
Wizardette #4110	\$14.90 list
Wizard #4220	19.50 list
Wizard Imperial #4230	34.90 list

ASK YOUR JOBBER FOR FULL INFORMATION  
AND TECHNICAL BROCHURE  
... OR WRITE DIRECT TO WALSCO.



**ELECTRONICS CORPORATION**  
A SUBSIDIARY OF *Tellatograph* CORPORATION

3602 Crenshaw Blvd.,  
Los Angeles 16, California

IN CANADA: Atlas Radio Corp., Ltd.





*Auto-Radio Technicians:*

# DELCO RADIO

TRAINING COURSES MEAN MORE BUSINESS FOR YOU



Working in small groups under factory-trained Delco instructors, alternate lecture and lab periods keep radio technicians up to date on latest radio and repair developments at a General Motors Training Center Delco Radio course.



Typical of the thirty General Motors Training Centers across the country is this one at Tigard, Oregon, a Portland suburb. Ample parking areas help to make this center popular throughout the Northwest.

Week-long courses for experienced service technicians provide latest radio and repair information—enable you to do the job faster and more efficiently.

Quick, accurate auto radio diagnosis and repair to factory specifications boosts your profits. That's why so many qualified auto radio technicians attend these Delco Radio training courses at no cost for tuition, school supplies, or equipment.

Factory-trained instructors, using latest equipment and instruction methods, conduct these intensified week-long courses, designed to familiarize repairmen with modern auto radio developments and factory-approved repair techniques.

The Delco Radio diploma, awarded only to those who successfully complete the course, is proof that you're equipped to give more and better service to more people—and that means more business.

If you're an auto radio service dealer, come yourself, or send your technicians. There's one of 30 GM Training Centers near you. Apply through your local Delco Electronic Parts Distributor or write Delco Radio Division of General Motors, Kokomo, Indiana.

**DELCO RADIO**

DIVISION OF GENERAL MOTORS  
KOKOMO, INDIANA

**HERE'S THE COURSE OF STUDY**—(1) Circuitry differences between home and auto radios. (2) Dead radio trouble-shooting procedure and lab. (3) Noisy radio trouble-shooting and lab. (4) Weak radio trouble-shooting and lab. (5) Distorted radio trouble-shooting and lab. (6) Intermittent trouble-shooting and lab. (7) Push-pull lock-up tuner lecture and lab. (8) Mechanical operation of Signal Seeking Tuner. (9) Electrical operation and trouble-shooting of Signal Seeking Tuner. (10) Autronic-Eye operation trouble-shooting procedure and lab. (11) Autronic-Eye installation and adjustment procedure. (12) Transistors and printed circuits.

# CROWN

## THE ONLY ALL NEW ANTENNA ROTATOR ON THE MARKET



*STYLED FOR GREATER SALES*

*PRICED FOR GREATER PROFITS*



Distinctively new and different, the beautiful Crown Tenn-A-Liner Model CAR68 is shown in combination with the exclusive Crown TV Planter. The planter, in forest green and chocolate brown china, is a completely separate unit that opens an entirely new field for antenna rotator promotion. Styled for feminine buy-appeal, the Tenn-A-Liner has sleek modern lines . . . handsome three-tone color styling . . . and harmonizes with dark or blonde woods, modern or traditional furnishings.

And remember, Crown gives you the highest profits in the TV antenna rotator field. Don't miss your chance to cash in! **SELL WITH CONFIDENCE . . . SELL CROWN!**



### FEATURES THAT MAKE CROWN THE MOST DEPENDABLE, EASIEST TO SELL ROTATOR ON THE MARKET

- Modern styling
- Smooth, constant, dependable performance under all conditions
- Exclusive "Weather-Guard" design
- Over-strength aluminum castings
- Internal automatic brake
- Only 1.06% of units sold require service

 **CROWN CONTROLS Co., Inc.** NEW BREMEN, OHIO

Canadian Subsidiary Crown Controls Mfg. Ltd. Export Division, 15 Moore St., New York, N. Y., Cable—"Minthorne"

## You and the LAW

FLOYD WILKINS, JR.  
MEMBER, NEW YORK BAR

(Continued from September)

• What can you do where you ask the infant's age only to find later that he either misled you by being silent or he actually lied, saying that he was over 21 and later disaffirms? If you are in Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia or Wisconsin, the courts will not permit the infant to deny his prior statements and actions indicating he was an adult. Thus, the infant, having caused you to rely on his representations of his age, is forced to act as if he is the adult he said he was. Five states—Iowa, Kansas, Michigan, Utah and Washington—recognize this same rule by statute. Therefore, in all of these states, if you think you are dealing with an infant, ask him his age. Have him answer either in writing or with a third person present. You should then be able to treat him as the adult he claims to be.

### Partial Redress

Ten states have adopted an approach that permits the misrepresenting infant to back out of his contract, but they give you the right to actual damages suffered as a result of the minor's misrepresentations. This does not mean that you will be able to enforce the contract. In fact, if the misrepresentations are part of the contract, you will lose. Therefore, be sure to ask the infant's age before you agree on the work to be done or the articles to be sold. States following this rule are Arkansas, Connecticut, Illinois, Indiana, Iowa, Louisiana, New Hampshire, Tennessee, Vermont and Wisconsin.

Be careful in Maryland, Massachusetts, New York, North Carolina and Pennsylvania, because neither rule about misrepresented age will apply. The only thing you can do is to deal with a parent or guardian who is responsible directly to you for the work or sale. Be sure that this person is not the agent of the infant, for if he is an agent, the infant still may disaffirm.

In some states you will be helped by statute, if the appropriate legis-

lation has been complied with. For example, in Alabama, Arkansas, Florida, Kansas, Louisiana, Mississippi, Oklahoma, Tennessee, Texas and Wyoming the infant may apply to the local court to have removed the right to disaffirm. Thereafter, the infant is treated in all respects as an adult, thereby eliminating the problems raised by the general rule discussed above. However, only infants who have gone through this statutory process are to be treated as adults; others are still potential sources of troubles.

In Florida, Iowa, Kansas, Louisiana, and Utah an infant automatically becomes an adult when he or she marries. However, in Alaska and Nebraska only the wife becomes an adult upon marriage. Hence, in our example concerning the couple, you could deal with her safely but not with the husband.

#### "Business" Contracts

The problem of an infant's disaffirming his contracts is particularly serious in business, because logically we believe that a person in business is mature enough to realize and to be held to the consequences of his enterprise. However, the thinking behind the disaffirmance rule is that until one becomes 21 he must be protected from his own folly as well as from the trickery of adults. It is clear that one in business should not have the right to back out of contracts as an infant can. Consequently, several states—Iowa, Kansas, New York, Utah and Washington—provide that the infant cannot wiggle out of reasonable contracts made in his business. These statutes are helpful, but they have not prevented law suits because the problems remain whether the contract is reasonable and is a business contract. Moreover, these laws do not help you in the case of the couple.

Do not rely solely on the fact that the person with whom you are dealing is a veteran. Although the problem lessens with the passing of time, its seriousness is shown by the fact that Congress and most states had to pass special laws protecting lenders against the power of disaffirmance. Insurance companies also have been protected by special laws in some states. But these laws do not protect you. Moreover, many of the statutes mentioned are restricted to minors who are 18 or over. As a practical matter the 18 to 21 group is the most troublesome, but there are cases involving infants of 16.

Here is what you should do as a general rule:

(Continued on page 48)

# NOW! TEST TUBES IN SECONDS! MAKE NEW PROFITS *in MINUTES!*



on every  
service call



NEW PORTABLE

## DYNA-QUIK

MODEL  
500

DYNAMIC MUTUAL CONDUCTANCE TUBE TESTER

ONLY  
**\$109<sup>95</sup>**  
NET

Now you can easily cut servicing time—make more on-the-spot tube sales—prevent costly call-backs—and give a better service guarantee! DYNA-QUIK—the new top quality, low cost, portable tester quickly locates all weak and in-operative tubes—and easily does the complete job with laboratory accuracy right in the home! You create greater customer confidence because your customer sees for himself the true tube condition. Easy to operate—in just a few minutes you can quickly check all the tubes in a TV set. You can depend upon DYNA-QUIK because it tests under the dynamic heavily loaded conditions that are the actual operating conditions of the set. At such low cost DYNA-QUIK quickly pays for itself—and continues to make money for you every day!

#### DYNA-QUIK DOES IT FASTER, EASIER, MORE ACCURATELY

- Makes complete tube test in as little as 12 seconds per tube—faster than any other tester!
- One switch tests everything! No multiple switching—no roll chart.
- Laboratory accuracy right in the home! Large 4½" plastic meter has two scales calibrated 0-6,000 and 0-18,000 micromhos.
- Shows customer true tube condition and life expectancy on "Good-Bad" scale!
- Automatic line compensation! Special bridge continuously monitors line voltage.
- 7-pin and 9-pin straighteners mounted on panel!
- Never Obsolete! New overlay panels with up-to-date markings available from factory, when required.

## TESTS 99%

OF ALL TUBES\*

in use today for:

**DYNAMIC  
MUTUAL CONDUCTANCE  
SHORTS  
GRID EMISSION  
GAS CONTENT  
LEAKAGE  
LIFE EXPECTANCY**

\*Including new 600 mil series tubes.

**PORTABLE—CAN BE  
USED ANYWHERE**

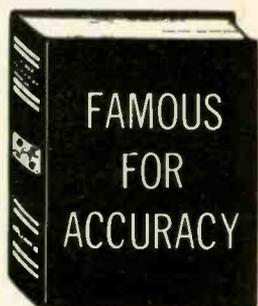
Handsome, rugged, luggage style carrying case, covered in durable, black leatherette. Removable slip-hinged cover. Size: 15½ x 14½ x 5¾ in. For 105-125 volts, 60 cycle, A.C. Net wt. 12 lbs.

SEND FOR BULLETIN 500T

Made by the makers of  
the famous CRT 350



**B & K MANUFACTURING CO.**  
3726 N. SOUTHPORT, CHICAGO 13



**JUST PUBLISHED!**

# RIDER'S TV-16



## LIMITED PRINTING

ORDER FROM YOUR JOBBER TODAY!

**NEW TEK-FILE RELEASES:  
PACKS 102 TO 155 AVAILABLE NOW!**

*(Continued from page 47)*

1. Deal only with an adult, if at all practicable, preferably the parent or guardian.

2. Be sure that the adult is not the infant's agent. In this connection make clear to the adult that you look only to him for payment.

3. If it is necessary to deal with a suspected infant in order not to lose the job or sale, and he says he is over 21, have the infant state his age in writing before you reach an agreement as to terms of your contract.

4. If you know you are dealing with an infant, realize that you are running the risk of disaffirmance. At this point your protection is practical: Either don't deal with him or reduce your risk by learning that this infant lives up to his obligations, as many of them do. •

### **"Long-Play" Portable Uses Transistors, 2 Speakers**

Latest version of Raytheon's all-transistor portable radio has been designed to work from a small "A" pack battery for 2500 hours. This is estimated to be about 2 years normal use. If the owner desires, however, the set may alternately be operated from 4 standard flashlight cells, as was the earlier model, for something less than half a year of normal use.

In addition, the "Super T" features 2 matched 5-in. speakers for improved fidelity. Earlier versions had already incorporated a pair of push-pull transistors in the audio output, together with negative feedback, for improved sound quality.

While the "Super T" is larger than its predecessor, it is only 1 ft. long in its maximum dimension, and weight of the complete receiver is a light 8 lbs.



**"Why you only just replaced that one ten-twelve months ago!"**



# SYLVANIA SILVER SCREEN 85

## more profit for you in "Silver Screen 85's"

# Stepped-Up Selling Power

Sylvania puts you in the driver's seat and backs you with more promotional horsepower than ever before. This Fall, it's all on all fronts to make your selling job easier and your servicing job more profitable. Here's how:

**Stepped-up TV power**—"Beat the Clock's" fabulous prize contest makes all your customers and prospects potential prize winners. 10 new prizes, 10 new winners every week. Week after week you'll win new customers who come to you for their free entry blank. And as a Sylvania Dealer only you can supply them with an official entry blank.

**Stepped-up magazine power**—Sylvania's selling the "Silver Screen 85" in the biggest consumer magazine campaign of 1955. Full schedules in *This Week* and *TV Guide* will presell your customers on the three outstanding features of the "Silver Screen 85" picture tubes. 11 million readers are reached by *This Week* through the combined distribution of 35 great American newspapers. Over 3 million TV viewers use *TV Guide* every week for TV news and program listings.

**Stepped-up promotional power for you.** A complete package of Sylvania promotion material is available so you can fill in the important final link in this promotional chain reaction. Window and counter displays, new direct-mail material, the important "Silver Screen 85" booklet, and new ad mats are included to help you capitalize on the prize contest and national magazine program.

**Stepped-up profits for you.** Sylvania supplies selling power that adds up to more profit for you. Think with Sylvania—work with Sylvania—promote with Sylvania—and you can't help but profit with Sylvania.

SYLVANIA ELECTRIC PRODUCTS INC.  
1740 Broadway, New York 19, N. Y.

In Canada: Sylvania Electric (Canada) Ltd.  
University Tower Bldg., Montreal

LIGHTING • RADIO • ELECTRONICS  
TELEVISION • ATOMIC ENERGY



# SYLVANIA<sup>®</sup>

...fastest growing name in sight

# Rx for Ailing Hi-Fi Gear

Source of Trouble Is Often Outside the Electronic System

JAMES GRAFTON

• While the heart of any high-fidelity reproducing system is electronic, and generally familiar to the technician, many components include mechanical systems. Particularly in record changers and tape recorders, performance defects may be traced to these systems, or to the playing

medium itself (tape or record). Many defects in these categories can be traced to relatively simple causes:

## Record Changers

**Rumble:** This is mechanical vibration of very low frequency transmitted from the motor to the pickup. Most changer motors operate at 1800 rpm (or 30 cps). For this reason, rumble is not likely to be heard on

systems that do not have excellent bass response; nevertheless, its presence can contribute distortion to tones higher in frequency. A frequent cause is improper floating of the changer on its spring or cushion mounts. Make sure that shipping screws, which fasten changer tight against vibration-isolating mounts, are loosened or removed. In doing so, make sure level mounting of turntable is maintained.

Loose drive wheel bearings and a bent turntable are other sources of this trouble. If some rumble persists after all remedial steps have been taken, a soft-rubber mat on the turntable usually helps to provide additional rumble absorption.

**Wow:** Variations in turntable speed causing pitch changes are usually due to slippage or binding in the drive system. Check for friction against turntable, worn or eccentric idler, missing washer on central bearing. Oil on the drive or idler wheel may also cause slippage.

**Jamming:** The changer stops or sticks while trying to complete a change cycle; that is, go from the end of one record to the beginning of another. Shut off motor power and slowly rotate turntable by hand while observing the actuating mechanism under the baseboard. Check for insufficient lubrication, dirt in the actuating mechanism or excessively low line voltage.

**Tracking:** Skipping or repeating of grooves can be caused by inadequate tone-arm pressure, a non-level turntable, binding in the arm mount or extreme turntable vibration. If it occurs only on certain records, check the discs for warping or other defects. Skipping of the first few grooves at the beginning of a record may be caused by improper setting of the indexing or set-down adjustment for the arm.

## Tape Recorders

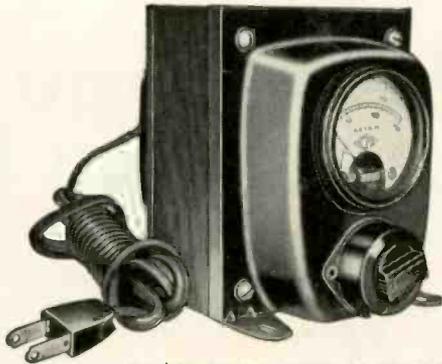
**Wow & Flutter:** Pitch changes result from defects in the drive system. Check for wear, eccentricity or oiliness of idler wheels, pressure roller, or drive belt; also for bent tape reels and improper tension adjustments.

**Poor High-Frequency Response:** Muddiness, muffled sound, lack of sharpness can result from accumulated dirt in record or playback heads, particularly in the head gaps. Head misalignment is also a frequent cause.

**Noise & Distortion:** Causes include insufficient bias current, incomplete erasure of previous recording on tape and electronic defects. Improper recording level is a common culprit.

(Continued on page 56)

**EVERY  
SERVICEMAN  
NEEDS THIS  
VOLTAGE  
ADJUSTOR**



T-8394M MANUAL VOLTAGE ADJUSTOR

Where low voltage is affecting TV reception, the service man can detect the condition at once with a T-8394M Acme Electric Voltage Adjustor. And by a simple demonstration he can sell a Voltage Adjustor to the TV set owner. Sales are easy to make because demonstration while servicing a set quickly convinces its owner that the voltage regulation is essential to good TV reception.

## How To Use The T-8394M VOLTAGE ADJUSTOR on Service Calls

With the tap switch set at 115 volts, the meter reading will show incoming line voltage. Thus it can be instantly determined if line voltage is lower than normal required for good TV set performance.

The T-8394M Voltage Adjustor can also be used to reproduce the operating condition about which the customer complains by turning tap switch to the voltage which simulates such condition. For example, customer complains that evening program pictures flicker and shrink. When service man calls next day all operation appears normal — voltage tests out properly. But, by adjusting voltage to 97 volts the condition about which the complaint was made is reproduced. This indicates low voltage condition during evening that can be corrected with a T-8394M Voltage Adjustor.

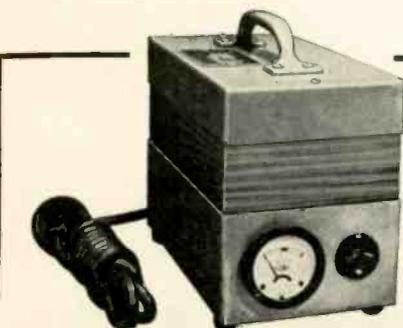
## Not A Gadget — A High Quality Unit You'll Be Proud To Use

The T-8394M Voltage Adjustor can be installed instantly, no tools needed. Just plug into most convenient outlet. Then plug television cord into secondary receptacle on Voltage Adjustor.

## FOR COMPLETELY AUTOMATIC VOLTAGE CONTROL

Regardless of line voltage supply, the Automatic Voltrol corrects voltage fluctuation over a range from 95 to 130 volts. The voltmeter supplied indicates secondary voltage while unit is in operation. A built-in relay automatically disconnects circuit when set is turned off.

**ACME ELECTRIC CORPORATION**  
MAIN PLANT: 8810 WATER STREET • CUBA, N. Y.  
West Coast Engineering Laboratories:  
1375 West Jefferson Boulevard • Los Angeles, California  
In Canada: Acme Electric Corp. Ltd.  
50 North Line Road • Toronto, Ontario

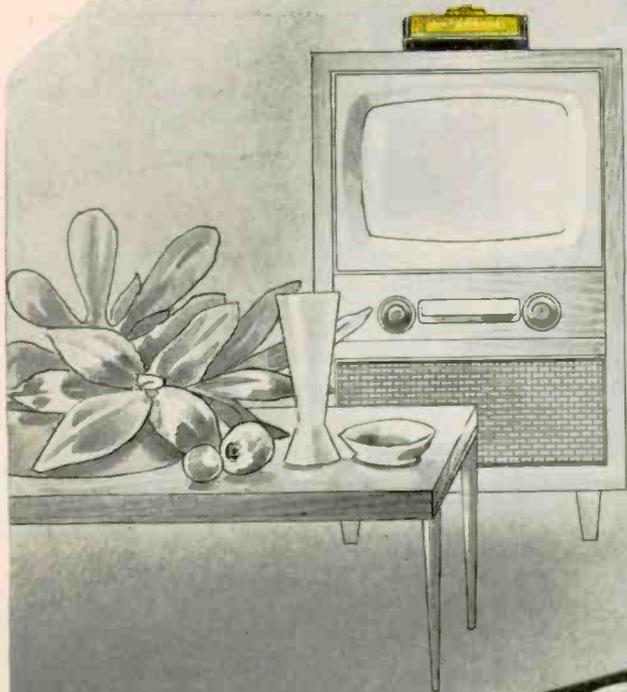


**Acme Electric**  
TRANSFORMERS

NEW!

NOISELESS!

ELECTRONIC!



**Thompson Products**

*Automatic*

**Superotor**



**INTERCHANGEABLE ROTORS** . . . . .

Famous time-proved Superotor models "100" and "500" have both been adapted for automatic operation!

World's only *silent* automatic antenna rotor! No gears, no click, no clatter. Electronic fingertip VP\* tuning. Antenna rotation and control is smooth, not in "steps" like ordinary automatics — provides a new standard of tuning accuracy for Fringe, UHF and Color reception. Write today for specifications.

\*VP (Vernier Precision)

**OTHER THOMPSON PRODUCTS  
ELECTRONIC AFFILIATES**

- Bell Sound Systems • Dage Television • Ramo-Wooldrige Corp. • Pacific Semi-Conductors, Inc.

**ELECTRONICS DIVISION  
Thompson Products, Inc.**



2196 CLARKWOOD ROAD • CLEVELAND 3, OHIO  
Available in Canada thru Atlas Radio Corp., Ltd., 50 Wingold Ave., Toronto

# STANDARD BRAND TUBES

AT SENSIBLE PRICES

Only the 5 Top-Quality Brands Shipped

- Individually boxed. • Only 1st quality. • Latest Dating. • Standard RTMA Guarantee.
- No private label, electrical or mechanical rejects. • No rebrands or rewashed "bargains." Consistent, high quality merchandise shipped order after order.

Write for Free 1955 New Air-Mail Handy-Order Blank.

- Lists ALL Popular TV & Radio Types. • Makes Mail-Order a Pleasure.
- All Tube Orders Over \$25.00 (with full remittance) Postpaid in U. S. A. Overnight Shipment.

Tube Type	Unit Price	Tube Type	Unit Price	Tube Type	Unit Price	Tube Type	Unit Price	Tube Type	Unit Price	Tube Type	Unit Price
0A2	.85	354	.80	6AS7G	3.75	6L6GA	1.30	7N7	.95	1486	.85
0B2	.85	3V4	.85	6AS8	1.20	6L6M	1.50	7Q7	1.00	14C7	1.00
0C3/VR-90	.85			6AT6	.55	6L7	1.15	7R7	1.30	14E6	1.20
0C3/VR-105	.90	4807A	1.30	6AT8	1.10	6N7	1.15	7V7	1.30	14E7	1.30
0D3/VR-150	.90	4B27	1.35	6AU4GT	1.00	6Q7	.95	7W7	1.30	14F7	1.00
0Z4	.50	5AM8	1.05	6AU5GT	1.10	6S4	.65	7X7	1.00	14F8	1.30
0Z4G	.65	5AN8	1.10	6AU6	.60	6S8GT	1.10	7Y4	.70	14H7	1.00
1A5GT	.80	5A05	.75	6AU7	.90	6SA7GT	.65	7Z4	.70	14H7	1.00
1A7GT	1.00	5AS8	1.10	6AV5GT	1.20	6SC7	.75			1407	.95
1AD4	1.25	5AT8	1.10	6AV6	.55	6SF5	.75	12A4	.85	14R7	1.30
1AE4	1.00	5AY8	1.15	6AX4GT	.85	6SF7	.90	12A5	.70	14S7	1.25
1AG4	1.25	5AW4	1.15	6AX5GT	.75	6SG7	.75	12A05	.75	14W7	1.35
1AX2	1.00	5AZ4	.60	6B4G	1.25	6SH7	.80	12AT6	.55		
1B3GT	.90	5J6	.90	6BA6	.65	6SJ7M	.70	12AT7	.95	19B6G6	2.00
1H5GT	.75	5R4GY	1.55	6BA7	.90	6SK7GT	.65	12A06	.60	25AV5GT	1.30
1L4	.85	5T4	1.75	6BC4	1.60	6SL7GT	.80	12A07	.80	25AX4GT	1.10
1L6	1.10	5U4G	.60	6BC5	.70	6SN7GT/A/B	.80	12AV6	.55	25BK5	1.00
1L4A	1.00	5U4GB	.70	6BC7	1.25	6SO7GT	.60	12AV7	1.00	25BQ6GT8	1.35
1L6A	1.00	5U8	1.10	6BD5	1.40	6SR7	.70	12AW6	1.00	25CD6GA	1.75
1L8A	1.00	5V4G	.95	6BD6	.75	6SS7	.85	12AX4GT	.90	25C6	1.35
1L6S	1.00	5V6GT	.70	6BE6	.70	6ST7	1.15	12AX7	.80	25L6GT	.65
1L6C	1.00	5W4GT	.70	6BF5	.85	6T8	1.05	12AY7	1.75	25W4GT	.75
1LD5	1.00	5X4G	.80	6BF6	.70	6U5	.90	12AZ7	.90	25Z5	.70
1LE3	1.00	5X8	1.05	6BG6G	1.80	6U8	1.00	12B4A	.85	25Z6GT	.65
1L6S	1.00	5Y3GT	.65	6BH6	.80	6V3A	1.30	12BA6	.65		
1LH4	1.00	5Y4G	.45	6BJ6	.70	6V6GT	.65	12BA7	.95	35A5	.70
1LNS	1.00	5Z3	.80	6BK5	.90	6V6M	1.30	12BD6	.75	35B5	.70
1W5GT	.90	5Z4	1.25	6BK7A	1.10	6V6GT	.60	12BE6	.70	35C5	.70
1R4	1.00	6A7	1.00	6BL7GT	1.15	6W6GT	.80	12BF6	.65	35L6GT	.65
1R5	.85	6A8M	.00	6BN6	1.15	6X4	.50	12BH7A	.95	35W4	.45
1S4	.90	6A8GT	1.00	6BQ6GT	1.20	6X5GT	.50	12BK5	1.00	35Y4	.70
1S5	.70	6A8A	.65	6B07A	1.20	6X8	.95	12BQ6GT8	1.40	35Z5	.45
1T4	.80	6A8T	1.35	6BX7GT	1.25	6Y6G	.95	12B7A	.95	41	.75
1T5GT	1.05	6AC5GT	1.15	6BZ7	1.25	7A4	.80	12E7	1.00	42	.75
1U4	.75	6AC7	1.10	6C4	.50	7A5	.95	12J5GT	.70	50A5	.70
1U5	.70	6AD7G	1.45	6C5	.80	7A6	.80	12K7GT	.90	50B5	.70
1V	.95	6AF4	1.30	6C85	4.50	7A7	.80	12K8	1.10	50C5	.70
1V2	.70	6AF6G	1.20	6C86	.70	7A8	.80	12Q7GT	.80	50L6GT	.65
1X2B	.90	6AG5	.75	6C06G	1.75	7AD7	1.75	12SA7GT	.65	50M6GT	.90
2A3	1.30	6AG7	1.10	6CF6	.90	7AF7	.95	12SC7	.80	50Y6GT	.80
2AF4A	1.40	6AH6V	.85	6CG7	.85	7AG7	1.00	12SG7	.90	50Y7GT	.80
2D21	1.00	6AH5	1.00	6CL6	1.15	7AH7	1.00	12SH7	.95	70L7GT	1.55
2X2	.50	6AJ5	1.75	6CM6	.85	7A07	.90	12SJ7	.70	80	.65
		6AK5	.70	6CS6	.70	7B4	.80	12SK7GT	.65	81	1.90
		6AK6	.80	6CU6	1.40	7B5	.80	12SL7GT	1.00	83	1.00
3A3	1.10	6ALS	.60	6C06C	.95	7B6	.75	12SN7GT	.80	83V	1.00
3A4	.55	6AL7GT	1.40	6E5	.80	7B7	.80	12SQ6GT	.60	117L7GT	2.50
3A5	.75	6AM4	1.55	6F5	.85	7B8	.90	12V6GT	.75	117N7GT	1.95
3AL5	.65	6AM8	1.15	6F6M	1.00	7C5	.80	12W6GT	.90	117P7GT	1.95
3A06	.70	6AN4	1.50	6F6G	.80	7C6	.70	14A4	1.00	117Z3	.70
3AV6	.60	6AN5	3.50	6H6	.50	7C7	.85	14A5	1.50	117Z4GT	1.15
3B05	.80	6AN8	1.20	6J4	3.95	7E7	1.20	14A7	.85	117Z6GT	1.00
3B06	1.05	6A05	.70	6J5	.50	7F7	.90	14AF7	1.00	5642	1.00
3B76	.75	6A06	.60	6J6	.75	7F8	1.20				
3C86	.80	6A07GT	1.20	6J7	.95	7F9	1.15				
3CF6	.85	6A07S	.75	6K6GT	.60	7H7	.75				
3LF4	1.20	6AR6	2.25	6K7	.80	7J7	1.35				
3Q4	.85	6AS5	.75	6K8	1.20	7K7	1.20				
3Q5GT	1.00	6AS6	2.25	6L6G	1.15	7L7	1.15				

PICTURE TUBES DROP SHIPPED DIRECT FROM FACTORY. WRITE FOR PRICES.

You May Include Types Not Listed. We Stock Over 2,000 Types Including Diodes, Transistors, Transmitting and Special Purpose Types. Write for Sheet.

**TWO-COLORED TUBE CARTONS**, with new Safety Partitions. Prevents Tube Breakage. This Super-Gloss Red and Black Carton is the Most Distinctive Box Available Today! Minimum: 100 any one size. Case Lot Quantity Price on Request. Boxes F.O.B., N.Y., N.Y.

SIZE	FOR TYPES SUCH AS	EACH
Miniature	(6AU6, 6AL5, etc.)	1¢
GT	(6SN7, 6W4, etc.)	1 1/4¢
LARGE GT	(1B3, 6BQ6GT, etc.)	1 1/2¢
LARGE G	(5U4G, 6BG6G, etc.)	2¢

NEW! Same tube cartons as above, but in glossy white... Same prices apply. Specify white...



Terms: 25% with order, balance C.O.D. All merchandise guaranteed. F.O.B., N.Y.C.

512 BROADWAY, DEPT. T • New York 12, N. Y. • WALKER 5-7000

## News of the Industry

**DONALD R. WEISENSTEIN** has been appointed manager, sales administration, RCA TUBE DIVISION.

**ROBERT W. FELBER** has joined the sales organization of the AMERICAN PHENOLIC CORP.

**AUTOMATIC MANUFACTURING CORP.**, subsidiary of GENERAL INSTRUMENT CORP., announces the development of small light silicon power rectifiers which will operate under shock and temperature stresses for industrial and military use.

**FRITZ A. GROSS**, authority on radar and related electronics devices, has been appointed manager of RAYTHEON MFG. CO.'s equipment engineering div.

**J. H. CRAFT, JR.**, of STROMBERG-CARLSON has been appointed chairman of the Service Committee of the Radio - Electronics - Television Mfrs. Assn. for 1955-56. **ALBERT J. FORMAN**, Editor of TECHNICIAN, has been reappointed a member of this committee.

**SAMUEL W. ARCHER** has been named assistant general merchandising manager for UNITED MOTORS SERVICE DIV. of GENERAL MOTORS CORP.

**FAIRCHILD RECORDING EQUIPMENT CO.** announces the appointments of RUBEN E. CARLSON as manager of high fidelity division, and ROBERT G. BACH as manager of promotion and distribution.

**DOUGLAS C. LYNCH**, president of BRUSH ELECTRONICS CO., has announced the appointments of two vice presidents. . . JOHN H. HARRIS as vice president and general works manager and DR. DAVID B. PARKINSON as vice president and general engineering manager.

**WESTON ELECTRICAL INSTRUMENT CORP.**, a subsidiary of DAYSTROM, INC., has announced the appointment of WILBERT H. STEINKAMP as vice president of sales.

**ARTHUR A. CURRIE** has been named vice president and general manager of ADAMS DISTRIBUTORS CO., INC., Boston and Providence, R. I.

**ELECTRICAL SUPPLY CORP.** has moved from its former location to larger quarters at 205 Alewife Brook Pkwy., Cambridge, Mass.

**TECHNICAL APPLIANCE CORP.** Sherburne, N. Y., has awarded scholarships to four Central New York high school students.

**HEART OF AMERICA CHAPTER,** Reps of Electronic Products Mfrs., Inc., awarded a two-door Plymouth Suburban as attendance prize at its conference at Rockaway Beach, Mo., Sept. 15.

**CBS-COLUMBIA** has announced the appointment of **KING DISTRIBUTORS,** Kearney, Neb., as distributors in western Nebraska. . . **CBS-HYTRON** followed the appointment of **RUCKER ELECTRONIC PRODUCTS CO., INC.,** Washington, D. C., distributor, with a dinner-sales meeting for the Rucker staff and a week-long open house for service-dealers in the area.

**JACOB H. RUITER** has been appointed manager of advertising and promotion of the Technical Products Div. of the **ALLEN B. Du MONT LABORATORIES, INC.**

**FRANKLIN GREENE, JR.,** has been appointed mgr., television mfg., Radio and Television Dept., **GENERAL ELECTRIC,** Syracuse, N. Y. **WILLIAM N. MADDOX** has been appointed mgr., radio mfg.

**NORMAN L. HARVEY** has been appointed chief engineer of the Radio and TV Div. of **SYLVANIA ELECTRIC PRODUCTS INC.,** Buffalo, N. Y.

**JOHN BENTIA** was elected president and general manager of **ALLIANCE MFG. CO.,** Alliance, Ohio, by the officers of Consolidated Electronics Industries Corp., new owners of the company. Other elected officers are **ARIES VERNES,** vice president; **R. D. DETTMER,** secretary; **ROBERT DUNN,** treasurer, **R. E. BARRICK,** assistant treasurer.

**WILLIAM J. SHEA,** chairman of the board of **CHICAGO STANDARD TRANSFORMER CORP.,** will assume the office of president during the absence, due to ill health, of **LARRY S. RACINE.** Subsequent appointments include **RAY GISLASON,** vice-president in charge of manufacturing plants; **P. NEWTON COOK,** general sales manager; **R. J. REIGEL,** sales manager of the Chicago and Stancor Catalog divisions.

**MARTY WOLF** has been appointed advertising and sales promotion mgr. of the **B & K MFG. CO.,** Chicago, Ill.

**ROY G. TRUE** has been named executive vice-president of **I.D.E.A., INC.**

**G. LEONARD WERNER** has been appointed Director of Sales and **JOHN P. YOHE** Director of Purchases of the **ASTATIC CORP.,** Conneaut, Ohio.

**MICHAEL P. FUMAROLA** has been appointed Publicity Director for all divisions of **JFD Mfg. Co.,** according to Julius Finkel, President.

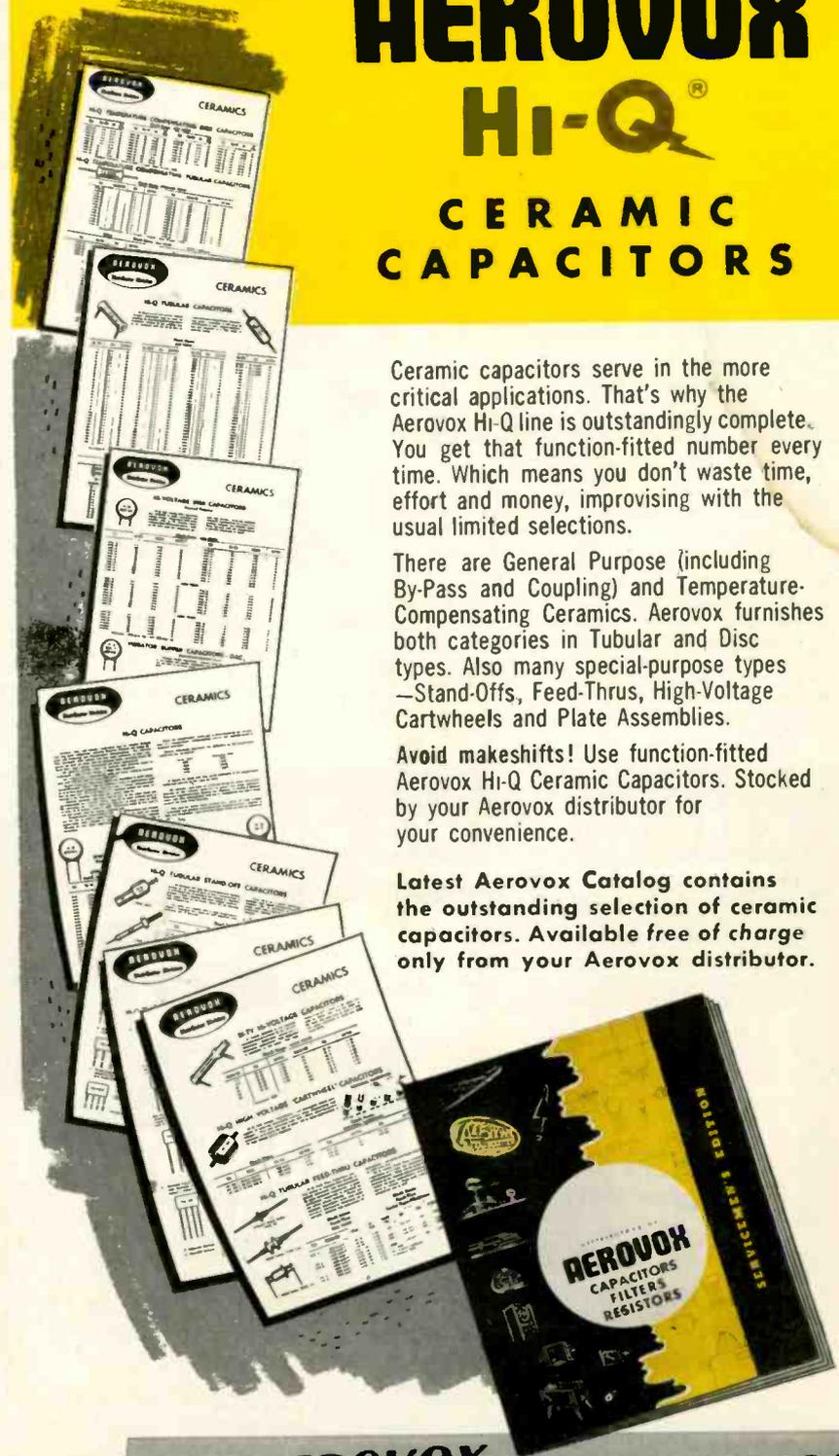
**HOLLOWAY ELECTRONICS CORP.,** Ft. Lauderdale, Fla., is going into production of their line of all-channel exponential antennas.

Avoid makeshifts . . .  
use function-fitted

# AEROVOX

## Hi-Q<sup>®</sup>

### CERAMIC CAPACITORS



Ceramic capacitors serve in the more critical applications. That's why the Aerovox Hi-Q line is outstandingly complete. You get that function-fitted number every time. Which means you don't waste time, effort and money, improvising with the usual limited selections.

There are General Purpose (including By-Pass and Coupling) and Temperature-Compensating Ceramics. Aerovox furnishes both categories in Tubular and Disc types. Also many special-purpose types—Stand-Offs, Feed-Thrus, High-Voltage Cartwheels and Plate Assemblies.

Avoid makeshifts! Use function-fitted Aerovox Hi-Q Ceramic Capacitors. Stocked by your Aerovox distributor for your convenience.

Latest Aerovox Catalog contains the outstanding selection of ceramic capacitors. Available free of charge only from your Aerovox distributor.



## AEROVOX CORPORATION

DISTRIBUTOR SALES DIVISION,  
NEW BEDFORD, MASS.

In Canada: AEROVOX CANADA, LTD., Hamilton, Ont.  
Export: Ad. Auriema, 89 Broad St., New York, N. Y. • Cable: Auriema, N. Y.

for service and lab. work

## Heathkit PRINTED CIRCUIT OSCILLOSCOPE KIT FOR COLOR TV!

① Check the outstanding engineering design of this modern *printed circuit* Scope. Designed for color TV work, ideal for critical Laboratory applications. Frequency response essentially flat from 5 cycles to 5 Mc down only 1½ db at 3.58 Mc (TV color burst sync frequency). Down only 5 db at 5 Mc. New sweep generator 20-500,000 cycles, 5 times the range usually offered. Will sync wave form display up to 5 Mc and better. Printed circuit boards stabilize performance specifications and cut assembly time in half. Formerly available only in costly Lab type Scope. Features horizontal trace expansion for observation of pulse detail — retrace blanking amplifier — voltage regulated power supply — 3 step frequency compensated vertical input — low capacity nylon bushings on panel terminals — plus a host of other fine features. Combines peak performance and fine engineering features with low kit cost!



MODEL  
0-13  
\$6950.  
Shpg. Wt.  
27 lbs.



MODEL  
TS-4  
\$4950.  
Shpg. Wt.  
16 lbs.

## Heathkit TV

## SWEEP GENERATOR KIT ELECTRONIC SWEEP SYSTEM

② A new Heathkit sweep generator covering all frequencies encountered in TV service work (color or monochrome). FM frequencies too! 4 Mc — 220 Mc on fundamentals, harmonics up to 880 Mc. Smoothly controllable all-electronic sweep system. Nothing mechanical to vibrate or wear out. Crystal controlled 4.5 Mc fixed marker and separate variable marker 19-60 Mc on fundamentals and 57-180 Mc on calibrated harmonics. Plug-in crystal included. Blanking and phasing controls — automatic constant amplitude output circuit — efficient attenuation — maximum RF output well over .1 volt — vastly improved linearity. Easily your best buy in sweep generators.

**Heath**  
COMPANY  
A SUBSIDIARY OF DAYSTROM, INC.  
BENTON HARBOR 18, MICH.

WRITE FOR FREE CATALOG  
...COMPLETE INFORMATION

## Reps and Distributors

LARRY H. KLINE has been appointed manager of commercial product sales for the Electronics Div. of THOMPSON PRODUCTS, INC., Cleveland, Ohio.

MERIT COIL & TRANSFORMER CORP., Chicago, Ill., has announced the appointment of ART CERF & CO., Newark, N. J., as rep for the upper New York area.

CLADCO DISTRIBUTORS, INC., Buffalo, N. Y., has been named distributor in the Buffalo area for SYLVANIA ELECTRIC PRODUCTS INC.

RAM ELECTRONICS SALES CO., Irvington-on-Hudson, N. Y., has announced the appointment of the PAUL F. WILEY CO., Los Angeles, Calif., as Southern Calif. and Ariz. rep.

ILLINOIS CONDENSER CO., Chicago, Ill., announces the appointments of MITCHELL AND MORRIS, Indianapolis, Ind., as sales rep for Ind., Ky., and Cincinnati; M. K. WIDDEKIND CO., Seattle, Wash., for Ore., Wash., Mont. and Ida.; PAUL HAYDEN & ASSOC., East Point, Ga., the Southeast. LANGHOUSE AND LEVY, Chicago, Ill., for Wis. and Ill.; F. W. MOULTHROP, San Francisco, Calif., for Northern Calif.; STAN BLAKER, Northfield, Ill., for Mich., Wis. and Ill.

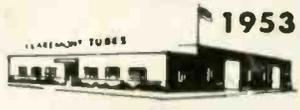
PYRAMID ELECTRIC CO., North Bergen, N. J., has announced the appointment of WILLIAM MEILY, Ft. Wayne, Ind., as industrial rep for Ind., Ky. and Mich.

HICKOK ELECTRICAL INSTRUMENT CO., Cleveland, Ohio, has been appointed exclusive American distributor for DAWE INSTRUMENTS, LTD., London, Eng.

JENSEN MANUFACTURING CO., Chicago, Ill., announces the appointment of HYGRADE RADIO LTD., Vancouver, British Columbia, Canada, BROOKE DISTRIBUTORS, Miami, Fla., and HYLAND ELECTRICAL SUPPLY CO., Chicago, Ill., as wholesale distributors. Also appointed were R & R ELECTRONIC CO., Abilene, Texas, GODDARD-GAINSVILLE, INC., Gainesville, Fla., WARREN RADIO CO., Indianapolis, Ind., LAFAYETTE RADIO SUPPLY CO., Lafayette, Ind., OMAHA APPLIANCE CO., Omaha, Neb., RADIO PARTS CO., Milwaukee, Wis., KIERULFF & CO., San Bernadino, Calif., THUROW DISTRIBUTORS, INC., Fla., and GIFFORD-BROWN, INC., Ia.

INSULINE CORP. OF AMERICA, Manchester, N. H., has announced the appointment of FARBER-JACKSON, Buffalo, N. Y., as rep for parts distributors in upper New York.

KEEP GROWING with



**CLAREMONT  
TUBE  
CORP.**

Now Claremont offers you an opportunity to grow, too. Become a Claremont Tube distributor. Sell the finest replacement TV picture tube made.

More than 30,000,000 television receivers are now in use. It is estimated that one-fourth will need a new picture tube every year—for a repeat, regular demand of 7-8,000,000 replacement CRT's annually.

New Claremont distributors are being appointed. Learn how you can become a Claremont dealer in your territory. Write for more information NOW.

**CLAREMONT TUBE CORP.**

36-04 35th Ave., Long Island City, N. Y.

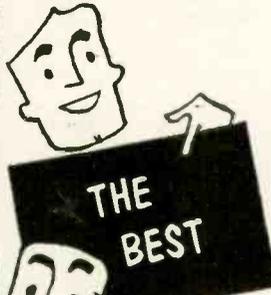




# KESTER



Absolutely non-corrosive and non-conductive, KESTER "RESIN-FIVE" CORE SOLDER contains an activated type of resin that gives you that fast, positive action on all your jobs . . . including the most difficult.

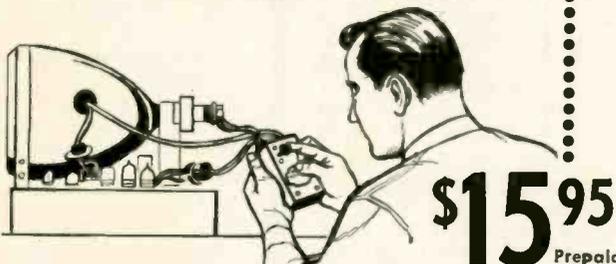


KESTER SOLDER COMPANY  
4264 Wrightwood Avenue • Chicago 39, Illinois  
Newark 5, New Jersey • Brantford, Canada

# SOLDER

it's here!!

## DYNA-BEAMER CRT. REACTIVATOR



Now you can own an entirely new picture tube reactivator at a price that any TV service shop can afford. The "Dyna-Beamer" reactivates picture tubes by the cathode sweep action principle . . . uses the TV set as a source of power and indicator. Can be carried in the tube caddy. Ten day money back guarantee if not 100% satisfied. Save money by ordering now direct from manufacturer.



Dept. T-10  
**TAMPA**  
**VIDEO SERVICE**  
6105 INTERBAY BLVD.  
TAMPA, FLORIDA

## Rx for Ailing Hi-Fi

(Continued from page 50)

**Loss of Tape Quality:** Deterioration of sound quality on recorded tape, including the gradual introduction of pre-echo or post-echo effects, results from improper tape winding or storage. Tightly or unevenly wound tape, especially after periods of storage, will show such effects. To retain tape quality, professionals don't rewind after they finish playing a reel of tape; instead they store it as wound on the take-up reel. The tape is rewound just before replay only, then again stored on the take-up reel after replay. Fast rewind is never as uniform as the slow, controlled wind during play. •

### DON'T DO IT YOURSELF!



Thrown into shock by the "do-it-yourself" craze, the domestic fixer caricatured above is the target of a Westinghouse tube division campaign. The cartoon is one of seven in a mailing piece planned for national distribution. The promotion will also highlight the reliability of trained technicians. Betty Furness will spearhead the campaign in "Studio One" TV commercials beginning Oct. 10.

### IMPORTANT NOTICE TO READERS

Changes of address require four weeks' notice. Notify your Postmaster and **TECHNICIAN** Circulation Department at the earliest possible moment.

When ordering change, please **INCLUDE IMPRINTED WRAPPER** showing exactly how magazine is now addressed. This will enable us to put the change into effect with a minimum of delay.



MODEL RE-1

## MULTIPHASE "Rejuva-Tube"

CRT REJUVENATOR

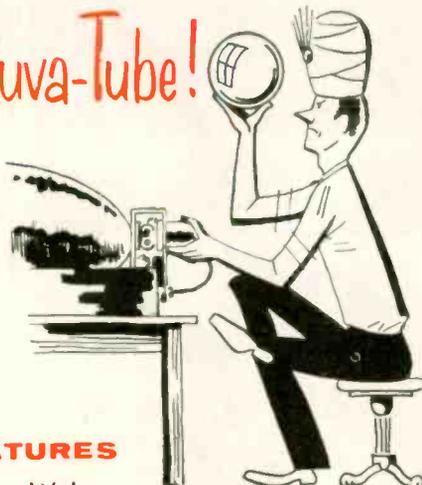
Brings "Dim-Outs" Back to Life  
SENSATIONAL MONEY MAKER

Complete Kit \$49.50 Factory Wired \$59.50

Condensed Instructions Printed Inside Case Lid  
Write for Manual on Rejuvenation with the "Rejuva-Tube"  
\*Patent Pending

# No Guesswork with Rejuva-Tube!

- Only Device That Meters Cathode Activity During Rejuvenation
- Tells Exactly When Rejuvenation Should Stop —
- Prevents Damage to Cathode Emitting Surface
- Built-in Current Limiter Eliminates Possibility Of Accidental Cathode Ribbon Burn-Outs



### COMPARE THESE FEATURES

Tests — Repairs TV Picture Tubes Without Removing Tube From Set

- Compact, light-weight and easy to use.
- Complete Tester: detects open or shorted elements and leakage as high as 3 megohms between elements.
- Highest quality lab instrument construction.
- Special metered circuit removes "particle" shorts between heater and cathode.
- Checks cathode emission and grid cut-off characteristic cs.
- Predicts approximate life-expectancy of tube — identifies gassy tubes.

DEALERS! Now you can sell those "dim-out" trade-ins at a good profit, and back them up!

SERVICEMEN! Sell rejuvenation service. Fully 80% to 90% of picture tubes that have gone dim in service can be quickly reactivated to furnish up to years of "bright as new" service!

"Rejuva-Tube" By The Designers of



Central Electronics, Inc.

247 W. Belmont Ave.

Chicago 13, Illinois

## A NEW PRODUCT

by the makers of the famous **"No Noise"** Volume Control and Contact Restorer

## NOISE TUNER-TONIC®

with PERMA-FILM

Cleans, lubricates, restores all tuners including water type. Won't change or affect capacities, inductance or resistance, nor harm insulations or precious metals, nor attack plastics. For television, radio and FM. Eliminates all noise oxidation and dirt indefinitely.

Non-toxic, non-inflammable, insures trouble-free performance. 6 oz. Aerosol Can.

Net to servicemen.

Extra economical because a small amount does the job!

\$3.25

**No Noise** Volume Control and Contact Restorer with Perma-Film

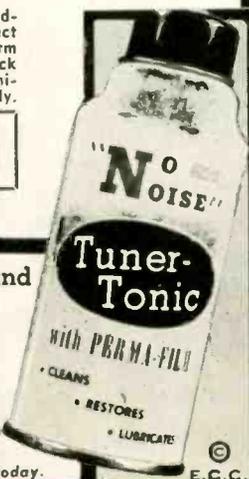
Cleans, lubricates, protects... not a carbon-tet solution. Still available in the new 6 oz. spray can.

Net to servicemen \$2.25

Also available in 8 oz. bottles and quart cans.

2 Oz. Bottle Net to servicemen \$1.00

Nearest distributor or write direct today.



## ELECTRONIC CHEMICAL Corp.

813 Communipaw Avenue Jersey City 4, N. J.



BASES LOADED. SCORE TIED  
...AND ☆!!☀️👄👁️!☆?!

What a revoltin' development!  
The answer to this situation is Fast, Efficient Service!

Television entertainment is hitting a new high.

Be ready to serve and skyrocket your profits!

Be There First with the Mos...

THE RAYTRONIC JUNIOR FIELD PORTABLE

CB-77N \$89.50



Raytronic LABORATORIES, INC.

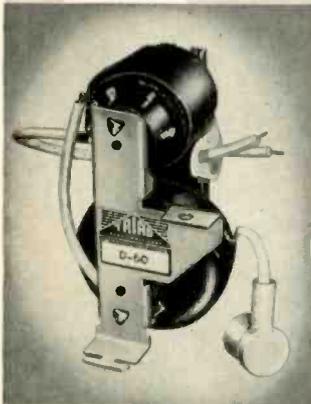
Cincinnati 15, Ohio

EXPORT International Standard Electric Ft. Wayne, Indiana, U. S. A.

**Your TRIAD parts distributor can supply your TV replacement needs**

*with TRIAD'S complete line of television replacement transformers*

*including these 5 new \*correct replacements just added to the TRIAD line*



TRIAD  
D-60  
Zenith  
\*Correct  
Replacement

- D-54 List Price \$6.50 \*Correct Replacement for RCA 77833.
- D-57 List Price \$9.00 \*Correct Replacement for Travler TV-X-107, 108, 110, 113, 114.
- D-58 List Price \$9.00 \*Correct Replacement for Zenith S-21219.
- D-59 List Price \$9.00 \*Correct Replacement for Zenith S-22154.
- D-60 List Price \$9.00 \*Correct Replacement for Zenith S-22130.

TRIAD \*CR (Correct Replacement) television transformers are mechanically and electrically correct ruggedized versions of mfr's items—and wherever possible COMPOSITE REPLACEMENT to fill a number of requirements where mechanical and electrical specifications are identical. All items are listed in Sams Photofact folders and Counterfacts.

write for Catalog TV-155K



4055 Redwood Ave. • Venice, Calif.



RAYTHEON MFG. CO., Waltham, Mass. announces it has arranged to purchase a large plant in Tewksbury and South Lowell in order to house 700 employees engaged in classified government work there.

GEORGE COHEN has been appointed director of service sales for EMERSON RADIO & PHONO. CORP.

JOHN O. RIGGS has been appointed product mgr. of cathode ray tube line for WESTINGHOUSE ELECTRONIC TUBE DIV., Elmira, N. Y.

JENSEN MFG. CO. announces the appointment of 14 new Hi-Fi wholesalers.

F. P. RICE has been named to the newly-created post of director of operations, Consumer Products Div., A. B. DuMont Labs. Mr. Rice was formerly director of manufacturing and purchasing.

G. WARREN KIMBALL has been named mgr., Battery and Renewal Components Marketing of the RCA Tube Div., Harrison, N. J.

MELVIN L. HAYDEN was appointed advertising-sales promotion manager of National Co., Inc., Malden, Mass.

TELREX INC. and TECHNICAL APPLIANCE CORP. (TACO) have entered into a patent license agreement on Telrex' conical antennas.

ROY M. HOWARD, Cleveland, Ohio, has been appointed to represent SECO MFG. CO., Minneapolis, Minn., in Ohio, West Penna., West Va., Ind. and Ky.

PACE ELECTRICAL INSTRUMENTS CO., INC., meter mfg. div. of PRECISION APPARATUS CO., INC., announces the appointment of seven new representatives. C. R. STRASSNER CO., Los Angeles, to cover CALIF.; A. J. NELSON CO., Denver, to cover COLO.; J. CLANCY & CO., Angola, Ind., to cover Ind.; MORRIS F. TAYLOR CO., Silver Spring, Md., to handle MD.; WOLFE-MARSEY SALES CO., Rochester, N. Y. will serve New York state; NORTHERN AGENCIES INC., Seattle, to cover state of WASHINGTON and KAELEBER & MACK, Manhasset, L. I., N. Y., to handle metropolitan N. Y. and Northern N. J.

TRANSFORMER REPLACEMENT GUIDE: New catalog lists transformer replacements for all model cars up to and including 1955, features Merit's line of vibrator transformers, speaker outputs, and i-f and r-f transformers. Guide No. 3 is available from Merit Coil & Transformer Corp., 4427 N. Clark St., Chicago, Ill. (Ask for No. B10-25)

Have you sent in your Test Equipment Contest entry? See page 33.

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## Institute Adopts Emblem

The Institute of High Fidelity Manufacturers, an organization whose membership list includes the foremost manufacturers of high fidelity components has recently adopted an identifying emblem. This insignia was designed by one of the members, Mr. Avery Fisher of Fisher Radio.

MEMBER  
INSTITUTE OF



This emblem, which pictures a lyre, the instrument of Orpheus, will be used on all official literature. It will also be made available to members of the Institute for use in advertising and promotion.

For further information regarding the Institute and its activities write to: Institute of High Fidelity Manufacturers, 25 Broad St., New York 4, N. Y.

## Beanery Employs Electronic Meal Ordering System

A young electronics engineer and an enterprising restaurateur have collaborated to provide something just a little bit different in the eatery business.

Some of the more famous patrons of Barney's Beanery, on Santa Monica Blvd. in W. Hollywood, Calif, are sitting down to piping hot dinners served moments after they arrive, thanks to a radio signalling system by which they flash the news of their coming and indicate the dishes they want made ready.

The system installed at the restaurant is designed around the old fashioned coach lamp which stands at the entrance. This lamp is connected through a relay and filter to a receiver which is fixed-tuned to 270 MC. The signals picked up by the receiver are generated by small CW transmitters which are installed

in the cars or boats of the restaurant's customers.

When the customer decides that he is coming in to eat, he flips on his transmitter, taps out his own code signal, then follows it up with a series of short or long flashes to indicate how many are in his party, what they want to eat and how soon they will arrive.

As he flips his transmitter on and off, the old coach lamp at the entrance is flashing in unison to notify the staff.

Reception is limited to approximately 25 mi.

Mac Brainard, the electronics en-

gineer who designed the system for proprietor Barney Anthony, estimates the cost of installing the transmitter in a car at about \$100.00.

**PHILCO** announces price increases ranging from \$10 to \$30 on 26 TV receivers effective immediately. For example: Model 4144, formerly selling for \$279.95, is now \$289.95 and model 6320C, which was \$500.00 is now \$525.00.

**FLIP CHART:** A 21-page colorful flip chart describing the "Kool-Sel" selenium rectifier line is available in 16" x 24" size and in pocket size by writing to Pyramid Electric Co., 1445 Hudson Blvd., North Bergen, N.J. (Ask for No. B10-11)

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TV PICTURE  
TUBES

### NEW DELUXE CRT 400 with 4½" Plastic Meter

This portable Cathode Rejuvenator Tester quickly locates and corrects picture tube troubles in a few minutes, right in the home, without removing tube from set! Restores emission, stops leakage, repairs inter-element shorts and open circuits. Life-test checks gas content and predicts remaining useful tube life. Grid Cut-Off reading indicates picture quality customer can expect. Earns servicing dollars in minutes. Cuts operating costs, eliminates tube transportation. Saves money on TV set trade-in reconditioning. Pays its way from the very first day.

Weights only 5 lbs. mounted in rugged, luggage style, carrying case covered with handsome, durable leatherette. Size: 11 x 7½ x 5".

Model 400. Net \$5495



Over 20,000 CRT'S  
NOW IN DAILY USE  
ACROSS THE NATION



### NEW ECONOMY CRT 200

A quick profit maker priced low enough for every serviceman to cash in on picture tube repairs. Performs most of the functions of the CRT 400. Has 3" meter. In leatherette carrying case. Size: 11 x 7½ x 5". Weighs 5 lbs.

Model 200. Net \$3995

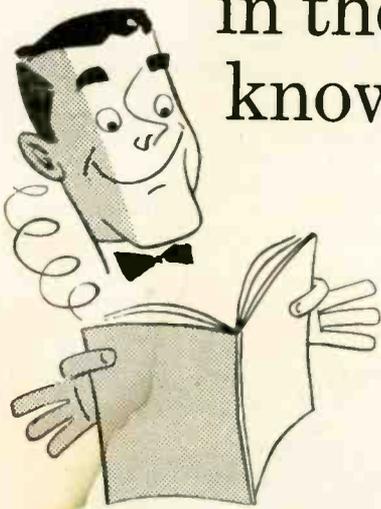


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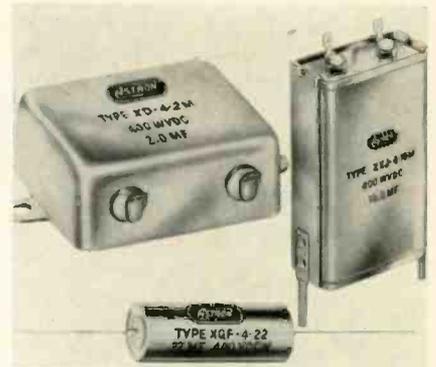
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job title is \_\_\_\_\_

## New Components

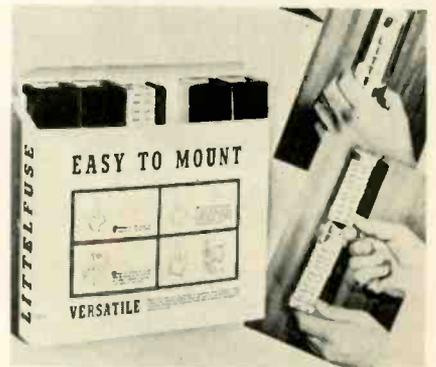
### Astron HI-TEMP CAPACITORS

Series "X" capacitors will operate up to 150° C without derating and beyond with derating. Using Mylar and other dielectrics, including a solid polyester impregnant, these miniaturized units are intended for critical operations. Available in hermetically sealed tubular, "Squeeze Seam" and Bathtub cases with glass-to-metal closures, they exhibit high insulation resistance, good stability, r-f and retrace characteristics. Astron Corp., 255 Grant Ave., Newark, N. J.—TECHNICIAN (Ask for No. 10-32)



### Littelfuse DISPENSERS

New single-channel fuse dispensers can be mounted by screws in single or multiple channels right over the work bench, facilitate stock control, showing at a glance when fuses need replenishing. Available in a package containing ten channels, each adjustable to dispense two types of fuses by folding in tabs in the middle of each channel. Package includes twenty boxes of the most popular fuse types. Littelfuse, Inc., 1865 Miner St., Des Plaines, Ill.—TECHNICIAN (Ask for No. 10-31)



### Illinois CONDENSER KITS

New "Handee-Pak" condenser kits are available in several assortments of the capacity and voltage ratings most used by the service technician. Each of the paper capacitor kits is made up of 10 assorted of the new Type ITC oil-impregnated ceramic-cased capacitors. "Handee-Paks" consist of 5 popular assorted capacitors. Kits are on cards sealed in polyethylene bags, are factory fresh and take up little room in the service kit. Illinois Condenser Co., 1616 North Throop St., Chicago 22, Ill.—TECHNICIAN (Ask for No. 10-33)



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## R-Columbia CLEANING AID

TrolMaster, a new tool, is said to clean and lubricate TV or radio controls in 60 seconds or less without chassis removal. Simply remove knob at front of control, fill TrolMaster with solvent, screw tool onto control, push plunger in, remove TrolMaster, and work control back and forth. Works on single or dual controls. User's price, \$3.95. R-Columbia Products Co., Inc., 305 Waukegan Ave., Highwood, Ill.—TECHNICIAN (Ask for No. 10-38)

## Sprague W-W RESISTORS

Four kits contain popular values of axial-lead Blue Jacket resistors. The compact wirewound resistors are useful where space is a problem. Sampler RK-1 includes 10 values from the 3, 5, and 10-w lines, lists at \$6.55. Assortment RK-2 has 15 3-w values, while RK-3 has 15 5-w values, and RK-4 15 10-w values. List prices for the assortments, designed for radio-TV, are: RK-2, \$8.50; RK-3, \$10.25; and RK-4, \$12.25. Sprague Products Co., 65 Marshall St., North Adams, Mass.—TECHNICIAN (Ask for No. 10-35)

## Ram FLYBACKS

The X124 horizontal output transformer replaces RCA 76154, 75519, 76381 and 75585, which covers 28 chassis and 38 models; the X125 is an exact replacement for RCA 76501, which covers 9 chassis and 32 models. Both units are direct-drive type designed for 66 to 70 degree systems. The X124 and X125 are capable of delivering 12 kv and 16.4 kv respectively. The units are relatively compact. Ram Electronics Sales Co., Irvington-on-Hudson, N. Y.—TECHNICIAN (Ask for No. 10-30)

## Erie CAPACITOR KITS

The Ceramicon TV Service Kit consists of an assortment of 62 general-purpose and by-pass disc Ceramicons; temperature-compensating tubular Ceramicons; printed circuits; and filter Ceramicons in an 18-section plastic case. The capacitors are those encountered for replacement most often. Erie Resistor Corp., Erie, Pa.—TECHNICIAN (Ask for No. 10-36)

## Merit FLYBACKS

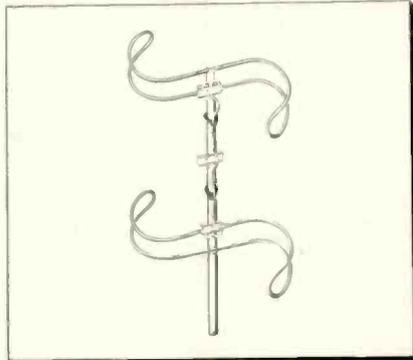
New transformers are: HVO 41, replacement for Airline, Coronado, Truetone, Arlington, Firestone, Wells-Gardner, Silvertone and Warwick receivers. List price: \$12.50. The HVO-42 replaces in CBS-Columbia, lists at \$10.50. The HVO-44 covers Airline, Coronado, Firestone, Truetone and Wells-Gardner, lists for \$11.00. The HVO-45 replaces in Westinghouse, lists for \$11.00. The HVO-48 is an exact replacement for Magnavox, lists at \$11.00. Merit Coil & Transformer Corp., 4427 North Clark St., Chicago, Ill.—TECHNICIAN (Ask for No. 10-34)

## Radio Antennas

### Taco HI-FI FM ANTENNAS

New line of antennas has features developed for TV use, adapted to FM. Included is an omni-directional S-type providing circular directivity. It has a broad-band folded dipole to cover entire FM band, matches 300-ohm line. By having the driven element at ground potential, lightning protection is provided automatically. Model 624L is a single version; the 2-stacked version is model 624ST-L.

A patented antenna with Twin-Driven feature, for extreme fringe, has sharp



directivity and high gain; is completely assembled. Element assembly to the crossarm is in the Auto-Lock design. The single-bay antenna is Taco No. 644, and the two-bay array is 645. Technical Appliance Corp., Sherburne, N. Y.—TECHNICIAN (Ask for No. 10-39)

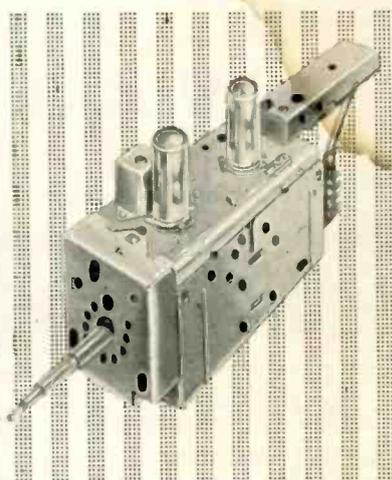
### A-S TWIN AUTO ANTENNAS

"Double Header" twin automotive antennas consist of a set of two 26½" (extended) telescopic antennas, complete with leads. Available in triple-plated chrome finish or a choice of baked-on colors—red, blue, green, yellow, white and brown. The new antennas will be of the same quality as the



"Baseball" Automotive Antenna. The "Double Header" is also being presented as a dummy set, without leads, for decorative purposes only. Suggested list prices are: Complete set with leads, \$12.95, chrome; \$14.25, color; dummy set without leads, \$7.50, chrome; \$8.75, color. Antenna Specialists Co., 12435 Euclid Ave., Cleveland, Ohio—TECHNICIAN (Ask for No. 10-40)

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example



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## Catalogs & Bulletins

**TRANSFORMERS:** A new 24-page catalog listing 543 transformers and related components, giving detailed electrical and physical specifications for each unit, in easy-to-read type, including illustrations. For free copies, write to Chicago Standard Transformer Corp., Addison & Elston, Chicago 18, Ill. (Ask for B10-1)

**AUDIO EQUIPMENT:** A new 14-page catalog which illustrates and describes the wide scope of high-fidelity speakers, speaker systems, components and enclosures and cartridges. For copy of catalog No. 123, write to Electro-Voice, Inc., Buchanan, Mich. (Ask for B10-2)

**YOKE, TRANSFORMER REPLACEMENTS:** Two new catalog cross-reference sheets, one for RCA and one for Motorola, list complete exact replacement line of deflection yokes, flybacks, vertical and power transformers for specific sets. All components made to original specs, including lead colors, connections, mountings and associated networks. Todd-Tran Corp., 156 Gramatan Ave., Mount Vernon, N.Y. (Ask for No. B10-20)

**CAPACITOR:** Bulletin with illustrations and tables containing full details on the first molded plastic tubular metallized paper capacitor developed. Write for bulletin No. AB-21 on the "Comet" to Astron Corp., 255 Grant Ave., East Newark, N.J. (Ask for B10-8)

**SOUND EQUIPMENT:** Information on TV & BC, PA, recording, communications, cessories, high-fidelity speakers, VEST special-purpose microphones and accessories, high-fidelity speakers, speaker systems, etc. For a free copy of cat. No. 123 write to Electro-Voice, Inc., Buchanan, Mich. (Ask for B10-4)

**CONDENSER MICROPHONES:** An 8-page brochure titled "Technical Information on Condenser Microphones" written at the engineering level and aimed at helping engineers and others doing professional sound work to utilize condenser microphones to their best advantage. Free from Frank L. Capps & Co., 20 Addison Place, Valley Stream, N.Y. (Ask for No. B10-5)

**AC LINE FILTER:** New C-728 filter enables high frequency units such as diathermy and ultrasonic oscillators, to meet FCC radiation requirements. Complete information may be obtained from the Potter Co., 1950 Sheridan Rd., Chicago, by asking for Bulletin TNN. (Ask for No. B10-6)

### OBTAIN THE BULLETINS

described here by writing on company letterhead to Bulletins Editor, **TECHNICIAN**, 480 Lexington Ave., New York 17, N. Y., listing numbers given at end of each item of interest. Please mention title of position held. Use coupon on page 60.

## New Books

**RADIO SERVICING COURSE.** Compiled by M. N. Beitman. Published by Supreme Publications, 1760 Balsam Rd., Highland Park, Ill. 192 pp. Paper cover. \$2.50.

Because the earnings are considerably higher in the TV servicing field than in radio, technicians tend to regard radio as TV's poor stepchild. Even in the early apprentice years, in school or on the job, radio is something to be tolerated until the technician can be allowed to work on TV receivers. This lack of interest in radio has two unfortunate results; first, a great many basically sound radios in need of just minor repairs are gathering dust, and, second, technicians are growing up in the business without the very necessary and important background that a knowledge of radio fundamentals gives them.

For the technician who made the hasty jump into TV servicing, this book offers an excellent opportunity to go back and pick up the fundamentals.

The introductory chapters deal with the characteristics of sound, electrons and magnetism. A very basic treatment of mathematics serves to introduce Ohm's Law, AC circuits, and the simple formulas for calculating resistances in series and parallel. Review questions at the end of each lesson provide the technician with an effective yardstick for feasuring his progress.

In addition to the usual sections on vacuum tubes, microphones, meters and power supplies, the author includes a very useful section in the radio servicing business itself; how to get started, how to compute charges, and tips on effective advertising.

**BASIC SYNCHROS AND SERVOMECHANISMS, Vols. 1 & 2.** By Van Valkenburgh, Nooger & Neville, Inc. Published by John F. Rider Publisher, Inc., 480 Canal Street, New York 13, N. Y. 272 pp (both volumes). Paper cover: \$5.50 for both volumes, \$2.75 each. Cloth binding: \$6.95 both volumes bound together.

With the great strides in automation and automatic control techniques, a definite need has been felt for a completely basic but thorough text for technicians who already have orientation in electronics, but are either completely or partially unfamiliar with the area of electronic controls. This set appears to fill that need. Prepared by the same group that was responsible for the background courses in "Basic Electricity" and "Basic Electronics," the newest text follows the same pattern of systematic, heavily illustrated presentation. The text is basic enough to start by explaining "What a Synchro Is." It is thorough enough to cover complex "transmitters" (generators) and "receivers" (motors) of control information.

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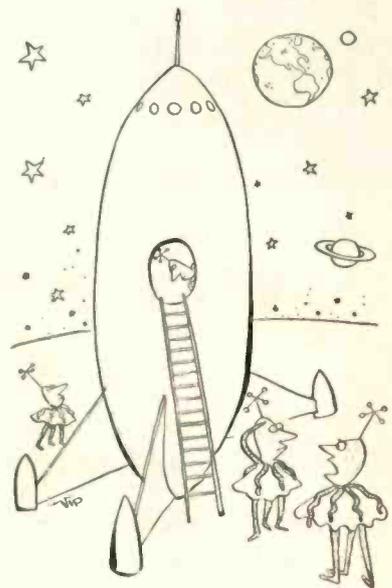
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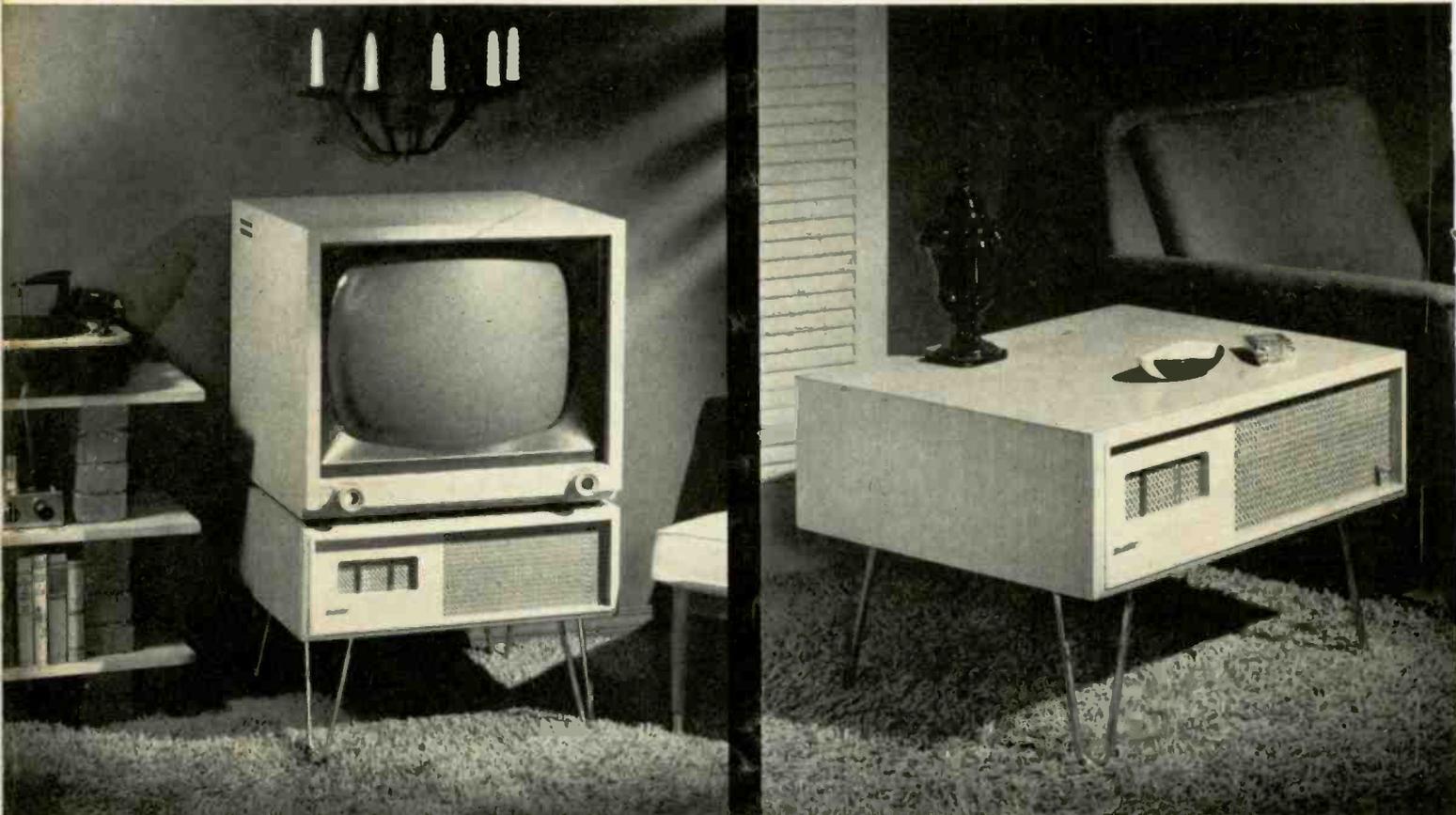
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Symbol No.	Rating $\mu\text{F}$ @WVDC	Crosley Part No.	Sprague Replacement
C13	50+30@150	155006	TVA-2450

### ZENITH CHASSIS 7X03

Symbol No.	Rating $\mu\text{F}$ @WVDC	Zenith Part No.	Sprague Replacement
C29	80+20+20@150	22-2399	R-2138

### MOTOROLA CHASSIS HS454

Symbol No.	Rating $\mu\text{F}$ @WVDC	Motorola Part No.	Sprague Replacement
C6	80+80@150/200@10	23B633289	R-2139
E1	Multiple C-R Plate	21B621535	DP-1

### RCA CHASSIS KCS96, A, B, C, D, E

Symbol No.	Rating $\mu\text{F}$ @WVDC	RCA Part No.	Sprague Replacement
C114	100+10@400/30+20@50	100858	R-2140
C195	100+10@400/80@350	100859	R-2141

### SENTINEL MODEL SM-1010

Symbol No.	Rating $\mu\text{F}$ @WVDC	Sentinel Part No.	Sprague Replacement
C78	20@450	25E86	TVA-1709
C79	200+5@150	25E85	R-1645
C80	140+10@300/200+30@150	25E87	R-2131
C81	150@150	25E84	TVA-1422

### DUMONT MODEL RA-350, 35

Symbol No.	Rating $\mu\text{F}$ @WVDC	DuMont Part No.	Sprague Replacement
C286	80+40+10+4@350	0315-1425	TVA-3792 TVA-1601
C287	80+10@350	03151427	TVA-2672
C288	5@100	03138362	TVA-1402
C289	20@350	03138364	TVA-1608
N201	Integrator Plate	88000631	V-1

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You'll never see your lawyer announce cut-rates for divorce cases . . .

You'll never see your dentist hold a "2-for-1" sale on extractions . . .

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most economical for you and definitely more satisfactory in the long run.

Unfortunately, as in any business, there will always be a few fly-by-night operators. But patients, clients, and TV set owners who recognize that you get only what you pay for, will never get gypped. "There just ARE no service bargains" . . . but there is GOOD SERVICE awaiting you at FAIR PRICES!

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PRESIDENT

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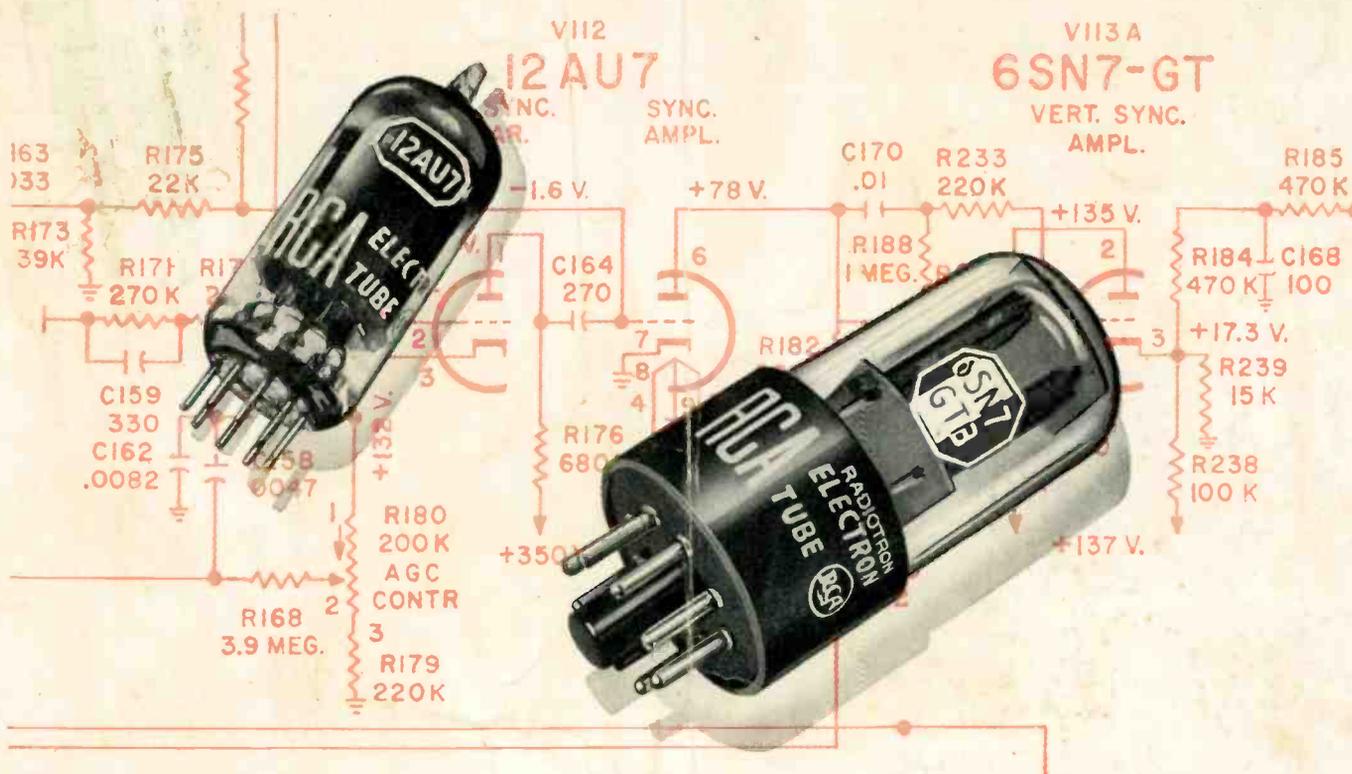
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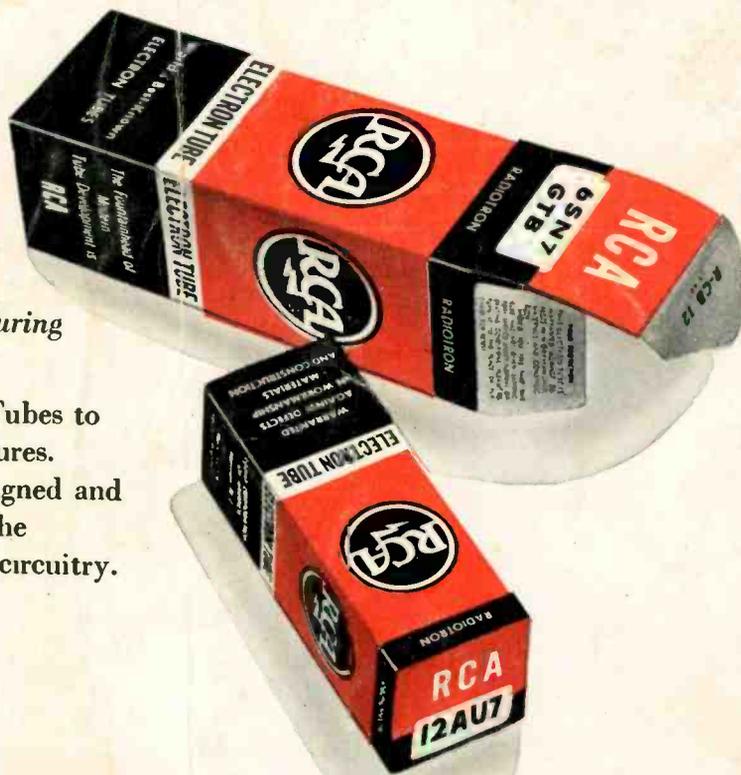


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