

SUCCESSFUL Servicing

DECEMBER 1952

The Philco UHF Conversion Kits

Part No. 43-6473 and 43-6474. UHF conversion kit Part No. 43-6473 permits the reception of UHF channels 14 through 83 when installed in the Philco R-F Chassis 91 or 94. This also holds true for kit No. 43-6474 when installed in the Philco R-F Chassis 81 and 84. The kit consists of a UHF tuner, a change-over switch, adapter cables and plugs, a planetary tuner driving assembly, and mounting hardware.

The UHF tuner converts the UHF signals to the intermediate frequencies of the r-f chassis 91 or 94, and converts the UHF signals to the frequency of either channel 2 or 3, and after amplification in the pre-amplifier, feeds into the VHF tuner antenna terminals.

In either case the incoming UHF signal is coupled to the antenna tank of the converter through a 150-ohm matching section. The antenna tank is coupled to the mixer tank by means of the mutual coupling of L2 and L3 and the stray capacitance (C5). The antenna tank and mixer tank select the desired channel signal and feed this signal to the crystal mixer circuit. The local-oscillator signal is generated by a 6AF4 tube, V1. The oscillator signal is coupled to the crystal

mixer circuit by the 300-ohm transmission line and the mutual coupling of L7 to L5 and L8 to L6.

Mixing of the r-f signal and oscillator signal in the mixer circuit produces a 45.75-mc. video carrier intermediate frequency in R-F Chassis 91 and 94, which is coupled to J500 on the VHF tuner. In UHF operation the local oscillator of the VHF tuner is inoperative, and the r-f amplifier and mixer circuits of the VHF tuner operate as i-f amplifiers.

uhf converters

Mixing of the r-f signal and oscillator signal in the mixer circuit in R-F Chassis 81 and 84 produces an output signal at frequency of either Channel 2 or Channel 3. This signal is amplified by the 6BQ7 tube and its associated wide-band amplifier, and is then fed to the antenna input of the VHF tuner. If a station operates on either Channel 2 or Channel 3 in the area where the receiver is to be used, the UHF station

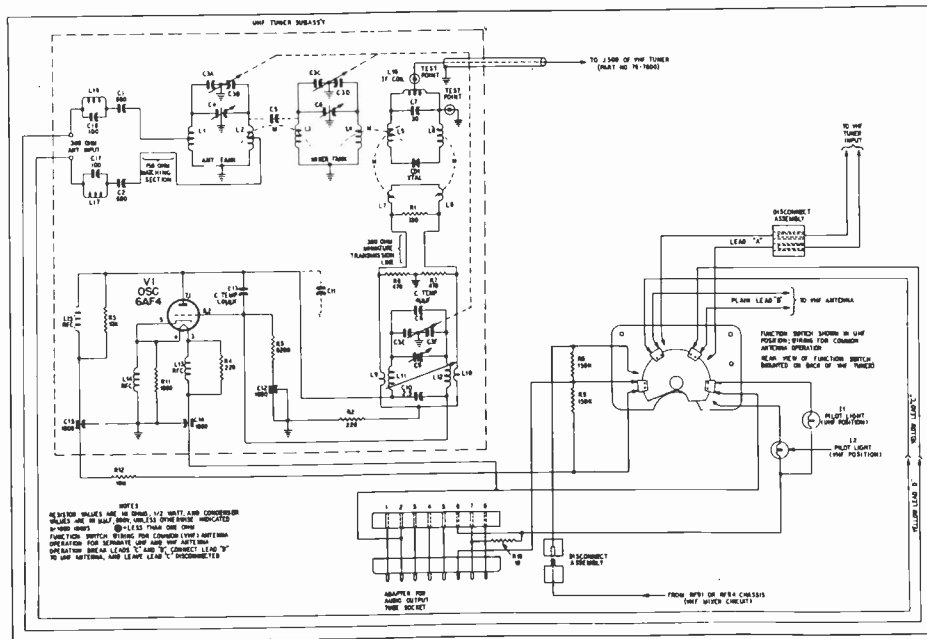
must be received on the unused channel. If no station operates on either Channel 2 or 3 either channel may be used for reception of the UHF station.

Conversion Kit Part No. 43-6473 for R-F Chassis 91 and 94. The change-over switch supplied with the kit is installed on the back of the VHF tuner, and is operated by the actuator on the VHF tuner shaft. When the Channel Selector of the VHF tuner is turned to the UHF position, the switch is thrown to its UHF position. In the UHF position of the switch a 150,000-ohm resistor is placed in series with the VHF mixer plate, thus dropping the voltage applied to this tube. This permits the mixer circuit to operate as an i-f amplifier. The change-over switch also turns off the VHF pilot light and turns on the UHF pilot light. When the receiver is connected for single-antenna operation, the switch also connects the antenna to the UHF tuner input. When the Channel Selector of the VHF tuner is turned to any channel from 2 through 13, the above procedure is reversed and a 150,000-ohm resistor is placed in series with the UHF local-oscillator plate circuit, thus

dropping the voltage applied to the circuit and putting the UHF oscillator out of operation.

The adapter plugs shown in the schematic diagram are not used in factory-installed units, and the cables are wired directly into the chassis at the required points. The adapter plugs are used in field-installed units. The octal adapter fits into the audio output tube socket, with the tube inserted into the socket of the adapter. This adapter supplies B plus, B minus, and filament power connections for the UHF converter. The single-conductor disconnect assembly is connected in series with the B plus supply for the VHF mixer circuit. The twin-lead disconnect assembly is used to connect the VHF tuner antenna input to the change-over switch.

The UHF tuner is tuned by means of a 3-gang tuning condenser, which is driven through a specially designed planetary drive. The planetary drive is constructed so that fine tuning and coarse tuning can be accomplished with one control knob. The tuning shaft is coupled to the driving shaft through three balls which form a planetary drive for fine tuning. After rotating 180 degrees with the tuning shaft, a pin engages the driving shaft, and the two shafts are direct-coupled, for coarse tuning. To re-engage the planetary drive for fine tuning, it is only necessary to reverse the direction of rotation. The dial pointer is connected to the tuning gang through a cord drive, and indicates the channel number to which the tuner is tuned.



Courtesy Philco

Fig. 1. Schematic Diagram, Philco UHF Tuner for R-F Chassis 91 and 94.

(Continued on page 13)

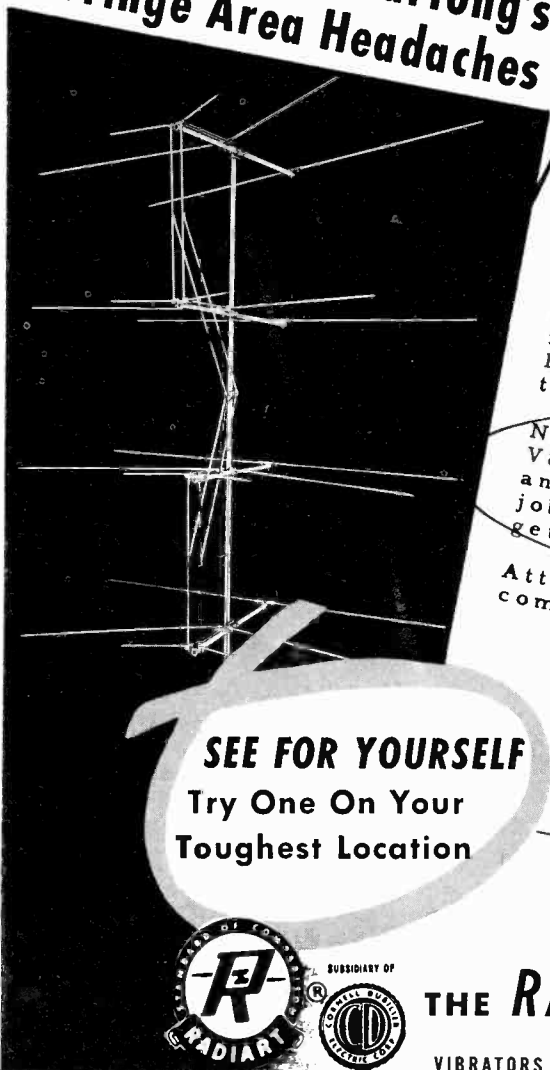
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Right Near the School*

by John D. Burke

Everything about the house seemed right. Especially the price.

To bargain a little was the natural thing, even without hope of gaining more than a concession here or there—perhaps just that new deep freezer thrown in. How short that discussion was—no tussle at all! Martha went crazy over the freezer—and did not seem to mind Mrs. Corwin's evident sorrow over giving it up.

Corwin made a showing of bravado—promised his wife an even better one. What a pretender!

How else could that additional \$500 off the purchase price be explained—even without being asked . . .

They really must be anxious to sell! Short of cash—perhaps. Simple enough!

As a buyer of anything at all, Sturgeon had always prided himself on being a careful man. "Never been swindled yet!" he always told his children, urging like behavior on their part.

Of course, this time the bargain was so evident he paid his deposit on the spot. No use looking any further; this was it.

Beautiful house, lovely garden, good street, near the stores, far from noise—good neighbors.

Matter of fact, it was the neighbors who first came under suspicion. Sturgeon remembered a case where a man bought a house like this, and woke up one morning to the crash of a window pane. It happens often enough—bought next to a "Dennis the Menace."

The title closing was put off a week while Sturgeon prowled the streets nearby—corralled every chance acquaintance; cross-examined the children; bought copy after copy of the same paper—asking, and asking . . .

No one knew of any menace to his peace on Ludlow Street.

No windows showed recent replacement.

There was no sign of hysteria—not even a little weentsie bit. No signs of compulsion to move.

Queer fellow, that Corwin, thought Sturgeon. Seems a sporting type—kind that likes to watch the fights. Yet, whenever I mention my favorite wrestlers, or fighters, he manages to change the subject. Oh well, must have plenty on his mind. Forced to sell . . .

But why? What kind of double-talk did he give . . . ? Why do Mrs. Corwin and

their kids sort of fade out whenever we ask their plans?

Sturgeon fully expected an argument when the second title closing delay was proposed. Corwin did mumble a bit—but then agreed.

Surely there is something wrong—thought an even more cautious Mr. Sturgeon. For he *knew* now that the house was worth an easy two thousand more than he was about to pay!



An appraiser had said so. Another agreed. Not Corwin's appraisers—no, his own. Friends of his for years. Said he was making an excellent buy.

Right near the school, too.

Again Sturgeon prowled. On the pretext that he wanted to figure out what furniture they would need to buy for the playroom, he prowled the basement.

Looking for rats—and other things.

Nothing.

—Looking for moles, tree blight, the seven-year-itch (who knows what!)—he prowled the garden.

The closets—the attic—looking for ghosts? (Little he knew!)

The week passed, and the title changed hands.

Afterwards they had a little party—the sellers and the sold clinked glasses and wished each other well. In the best of spirits, Sturgeon exulted—even expressed his condolences to Corwin for his bad luck in having to sell . . .

One thing marred the party for Sturgeon. It seems that Corwin's television had still not come back from that TV shop. He had so wanted to see Mauler Joe . . . Such service!

. . .

The answer came suddenly—all too plainly. There was no quarrelling with life. No doubt about it. This house had ghosts!

They flitted about—they sang—they danced—they played ball.

Sometimes they came singly—again they multiplied. And if that were not enough, sometimes they reversed themselves, as if seen on a photograph negative.

The worst of all were the fights. The fighters came in pairs—facing other pairs. And tank team fights were staged by eight men in this house!

Where Sturgeon had poked about for things in the dark—in the basement, under ground, in closets, cobwebby places—these men probed in the air. A finger—extendable, retractable, poking, turning—probed the air overhead. Higher—lower, here—there.

Now plans, specifications, consultations—experts, amateurs, amateurs who knew more than the experts—all the kids joined in.

Three alternatives:

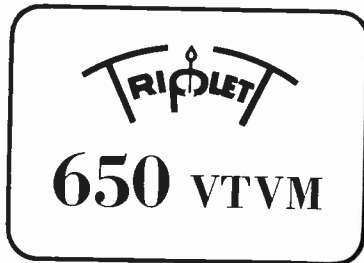
Do nothing and accept the ghosts.

Give up television. (No one dared suggest this to a modern family.)

Erect—at considerable expense—an elaborate back screen fence on one side of the roof. (*No guarantee* that this would completely end the ghosts.)

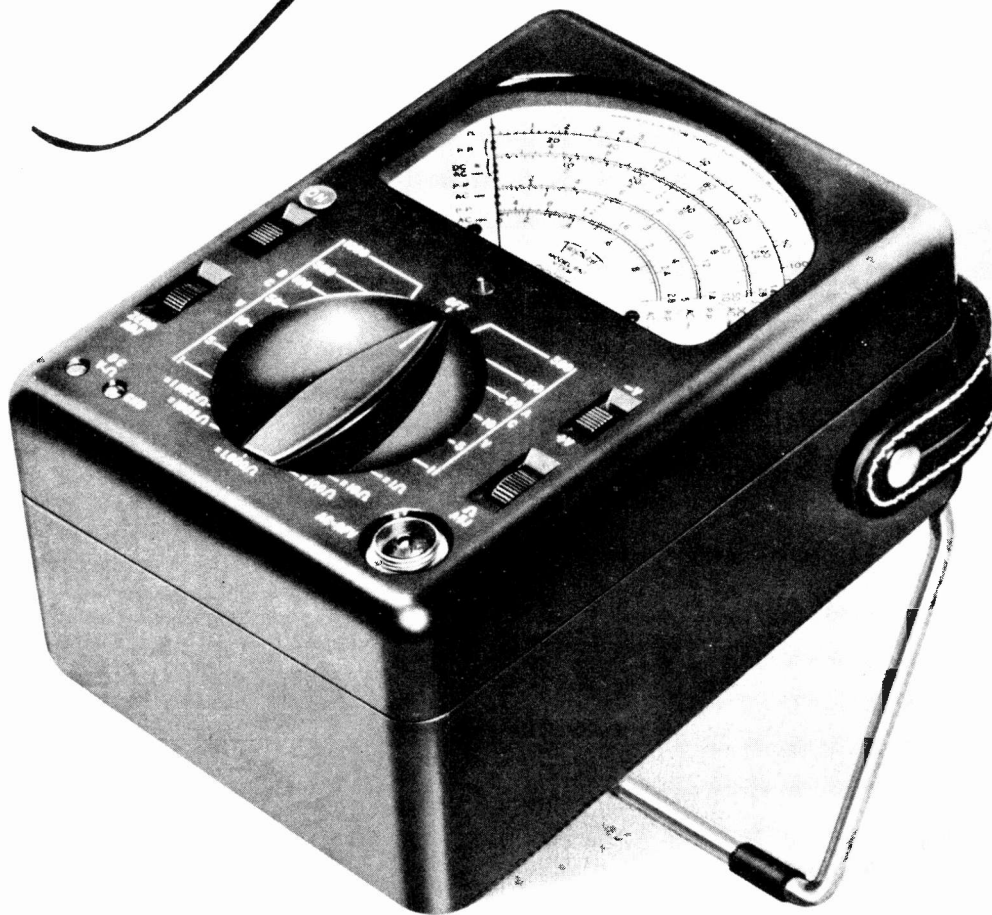
Then the most obvious solution came to Sturgeon's mind. He whispered it to himself, and while saying it, knew that the words had been spoken before, "Sell the house and move away!"

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which may be in operation in a certain area by using several spot frequencies? The device must be continuously variable so as to cover the entire band, and that is all. Two such signal sources, one for the carrier signal and the other for the marker, are all that are needed.

We realize that even this much can be expensive, but test equipment manufacturers possess the know-how to come up with something for less than \$400 or \$500. After all, UHF tuners designed for VHF-TV receiver use can be a source of ideas.

We have heard some rumors about an inexpensive UHF signal source for service technicians. More power to the designers. It is true that the best device is the cheapest in the long run, but there are times when the best may be too rich for the blood, and this seems to be the case with a UHF signal generator for the TV servicing field. Who'll be the first to lick this problem? We wonder.

Why Not More Standardization?

Every test equipment manufacturer knows that a better understanding of testing devices by the servicing industry will result in greater sales. Such understanding is hindered by the lack of standardization of nomenclature assigned to portions of test equipment which perform similar functions. We commented about this in our scope encyclopedia several years ago, but the practice is still rampant. We never entertained the idea that our comment would bring immediate action, but we did feel that the expressions of approval which we received from different test equipment manufacturers might bear some fruit in the long run.

Every attempt to describe the functioning of test equipment in general terms is hindered by the necessity of using a variety of identifications. And it makes it more difficult for the owner of a unit to apply what he reads to what he sees. Using similar nomenclature for similarly functioning controls may remove the individuality from different units, but it certainly will not lessen the unit's salability or its operating capabilities. After all, the individuality is found in brand names and capabilities, *not* in what the control is called. Hence it would be of great benefit to all concerned if the test equipment group would get together and do something about nomenclature.

Preventive Maintenance

Some time ago we spoke about PM (Preventive Maintenance) in the TV service shop. Recently we spoke with a large scale TV operator who declared that he instituted the practice. He noted that since he started Preventive Maintenance there had been a definite decline in the frequency of test equipment failure in his shop. The bigger the investment in test equipment the more vital is such a program, and the greater the ultimate savings. And, on the other hand, the guy who doesn't have too much to put out for test equipment replacement needs preventive maintenance even more.



John F. Rider

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Curtain Time

UHF Test Equipment

The entrance of UHF television presents a challenge to the test equipment manufacturers who cater to the servicing industry. It is a well known fact that the higher the frequency of operation, the higher the price of test equipment. It makes sense, since the problems of design are much more complex.

This is where the rub is. The UHF part of a television receiver is small in comparison to the rest of the unit. It includes one or two tubes and, dollarwise, represents a relatively small portion of the complete receiver price. Servicing the UHF tuner or converter calls for a suitable signal source. Measurement of the operating voltages is taken care of by the voltage measuring devices which are bound in every service shop. The types of troubles which may be encountered in UHF tuners and converters are not too numerous since the device contains relatively few components. In saying this we are not belittling the ingenuity required on the part of the receiver design engineer to give birth to a good, stable unit.

But regardless of what may be involved in the UHF portion of a TV receiver, how much can the average service shop afford to spend for the equipment he must buy to service this portion? Frankly speaking, it can't be too much. UHF equipment is expensive, but too much expense is not warranted when one considers the nature of the application, that is, in the TV service shop.

No one can deny that a sweep generator is a convenient tool, but is a UHF sweep generator necessary as a signal source if it makes the cost high? The average service shop already possesses a VHF sweep generator. Isn't it possible to work with carrier frequencies which are *not* swept to check the few UHF channels



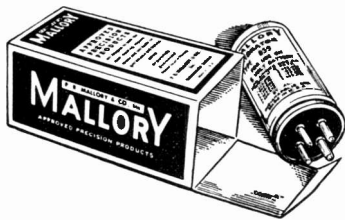
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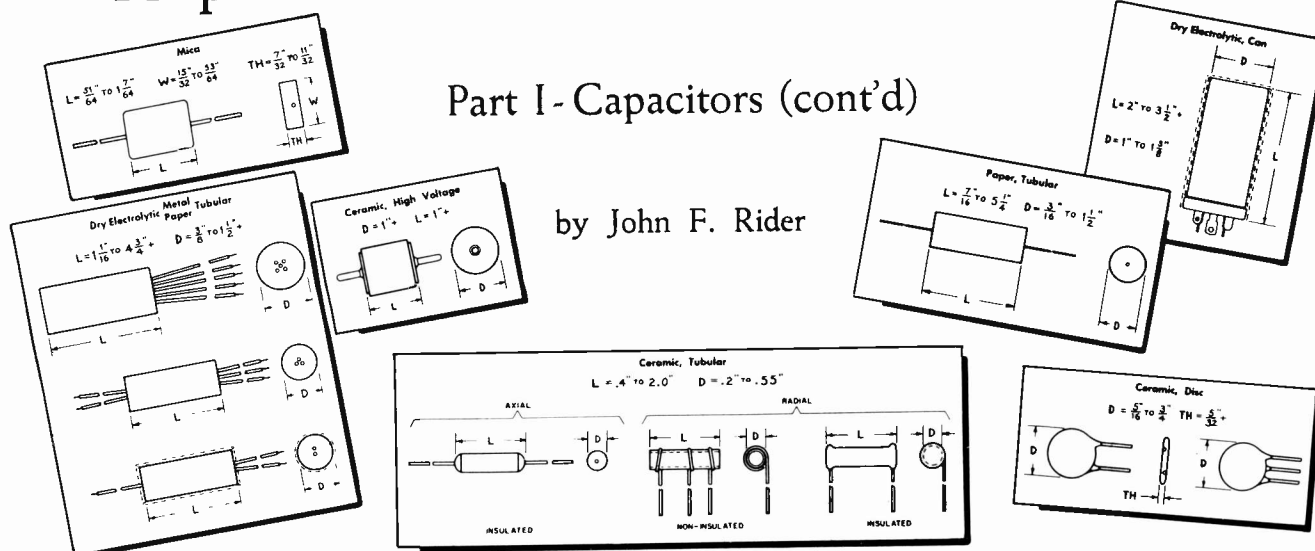
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Replacement Parts in TV Receivers

Part I - Capacitors (cont'd)

by John F. Rider



Moving down the scale of capacitance values for mica capacitors raises the series resonant frequency. Values from 500 $\mu\mu\text{f}$ down to about 10 $\mu\mu\text{f}$ result in self-resonant frequencies from about 25 mc up to as high as 280 mc. Depending on capacitance and connecting lead length self-resonance may occur at frequencies high up in the hundreds of megacycles range.

The same phenomenon is experienced with ceramic capacitors and paper dielectric tubulars. The former displays resonance at somewhat higher frequencies than the micas, whereas in the case of the paper dielectric tubulars, the frequency is somewhat lower.

These references to self-resonance should not be construed as expressions of comparative merit. They should be viewed as the basis for comments which appear in TV service literature stating the importance of maintaining capacitance values, lead lengths and lead dress when making replacements in front-end and i-f systems. The number of times that a TV receiver engineer makes use of series resonance phenomena for bypassing is not known because it is not indicated or labeled on a receiver or parts list. But since it is an effective method, the likelihood of it being used is high, and it is to the best interests of the service technician to pay more than just casual attention to these details when effecting a capacitor replacement. Adhering to this approach will neither complicate servicing nor make the procurement of replacement parts more difficult. Virtually every capacitor which may be used in this fashion is available from parts jobbers.

Two other items are of interest in connection with self-resonance effects in capacitors. Again they relate to high frequency circuits. It has been established that certain ratios of inherent L and C in a capacitor and its lead lengths can be used for filtering or bypassing purposes. This time, however, to accomplish varying degrees of filtering over a band of frequencies each

side of the self-resonant frequency. The frequency bandwidth over which the filtering is effective is determined by the L/C constant. The higher the ratio between L and C, the less the bypassing effect (or filtering) each side of the resonant frequency.

The final item of interest concerning self-resonance is when the presence of the action can be undesirable. Capacitors, especially micas and ceramics, are used in different ways in high-frequency circuits. Some of the applications are in circuits through which a band of frequencies are passed. In order to minimize the possibility of undesirable signal absorption effects or shunting due to self-resonance, set manufacturers frequently stipulate the low frequency limit of series resonance when they order their capacitors. As a further safeguard, the lead lengths are kept as short as possible when the capacitor is wired into the receiver.

Capacitors in TV receivers do not bear labels stating the engineering considerations. However, it is easy to take care of them when making replacements by using, as was stated before, the correct value of capacitance, the type and tolerance stipulated, and by duplicating the lead lengths used with the original part that is being replaced. We reiterate once more that doing this does not necessarily mean troublesome procurement, it simply means using the proper part and exercising care when replacing a defective capacitor.

Applications of Capacitors

Having discussed an inherent feature of capacitors and ways in which it is used, it is still necessary to describe the general manner in which capacitors of all kinds are employed. Understandably it is impossible in the limited space which we have available to describe each individual application, hence it is necessary to treat the subject broadly by categorizing the uses to which

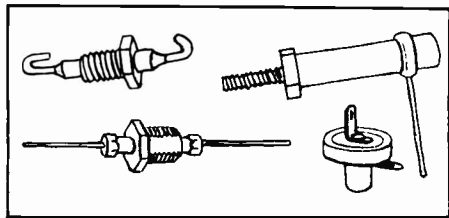
capacitors are put, also the kinds of capacitors used for these functions.

Tuning. The use of a capacitor for tuning purposes includes many uses. It includes resonating a coil (individually, or as a part of a transformer) to a given frequency, or to reject or accept a band of frequencies. Then there is the application with resistors to control the rise of signal voltage relative to time. These are the time constant circuits. Remotely it is a form of tuning in that the system can be made frequency selective to the extent that the circuit allows the build-up of a signal voltage at one or more frequencies to a substantially greater extent than at some other frequencies.

These uses appear in front-ends, video i-f amplifiers, sound i-f amplifiers, multi-vibrator circuits, deflecting systems, sweep systems, phase discriminator systems, tone controls, audio amplifiers, etc.

The kinds of capacitors which are employed in this fashion are mica and ceramic dielectric types in the main, and on occasion, paper and dielectric tubulars. The paper unit is not used for tuning in r-f or higher frequency circuits. Distinctions are to be found in the specific classifications of these general categories of capacitors which are used in this manner. That is to say, all classifications of micas or ceramics are not used in the same circuits of a section of the receiver. Some of the functions required for proper operation of the receiver are not available in all varieties of a single category of capacitor, hence the distinctive type within a general category is chosen. For example, and this is only a capsule review, many tuned circuits require temperature compensation in order to assure frequency stability. This special action can be accomplished by certain kinds of mica and ceramic capacitors — the temperature compensating kind. Generally speaking, the ceramic type unit is used preponderantly in these cases. More will be said about this later.

(Continued on next page)



Feed-through and button type capacitors.

D-C Blocking. The isolation of a d-c voltage applied to one point from another point which is electrically connected to the first is another application of capacitors. Sometimes this function is performed simultaneously with coupling, or transferring energy from one point to another, but for the sake of clarity we distinguish between the two.

Mica, ceramic and paper dielectric capacitors are used in this way. (The first two at picture and sound carrier frequencies, at the video and sound i-f frequencies, in the majority of sweep circuits and even in the audio amplifiers.) The paper dielectric capacitor on the other hand is used mostly for d-c blocking (and coupling) in the audio amplifier, although even here it has been replaced by the ceramic in many instances.

Coupling. The transferring of energy from one circuit to another where a direct connection cannot be used because of d-c voltages, is accomplished by capacitors in most instances. Of course electromagnetic coupling is a common method where transformers are used, but on occasion the action of the electromagnetic coupling between windings is complemented by capacitive coupling in order to secure the required frequency response.

Mica and ceramic capacitors are used throughout the TV receiver as a signal transfer component, although the paper dielectric unit divides the function with ceramics. There was a time when micas were very popular as coupling capacitors in all r-f circuits, and the paper dielectric unit was used in the low frequency systems; today the ceramic is replacing both kinds.

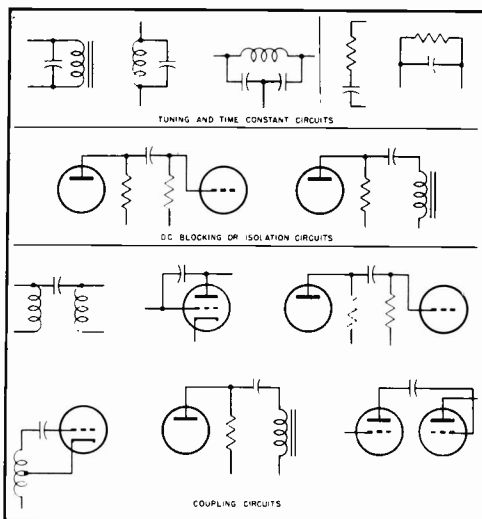
Bypassing. Bypassing is a fluid word. Fundamentally it is the process of keeping signal currents out of undesired paths by providing a separate low impedance path around them. Another viewpoint, which perhaps is even more basic, is that bypassing is a means for minimizing voltage fluctuations at a point in the circuit. Oftentimes this is expressed as keeping a point in a circuit at ground potential by connecting a suitable amount of capacitance between that point and ground (or chassis).

All four main categories of capacitors are used for bypassing. The type is determined by the frequencies involved. Mostly ceramic dielectric capacitors are used for bypassing in signal circuits operating at frequencies higher than the audio range. In audio and lower frequency circuits, paper dielectric and

electrolytic capacitors see service. On occasion two capacitors may be connected across the same circuit element, an electrolytic and a ceramic. The former is intended to bypass the low frequencies and the latter serves for the higher frequencies.

The choice of paper dielectric and electrolytic types is based on the impedance of the path being bypassed. The lower its impedance, the higher must be the capacitance of the bypassing capacitor, and this is most readily available in electrolytic types. The operating voltage involved also is a factor; electrolytic capacitors are available at various voltage ratings up to about 450 volts d-c, whereas paper dielectric units are available at much higher voltage ratings.

Filtering. Filtering is another broad function. Common usage has given it a singular meaning; namely, the process of removing the ripple frequencies from the output of rectifier tubes in a power supply, thereby providing a d-c output from the unit. Simultaneous with this action of the capacitor in a power supply is its behavior as a reservoir of electricity thereby affording a steady supply of d-c voltage and current.



Filtering has other interpretations as well. One or more capacitors used in conjunction with either inductors or resistors, as the case may be, accept, reject, attenuate or accentuate one or more frequencies; or allow all frequencies below a limit value to pass through a circuit, or allow all frequencies above a limit value to pass through the circuit. Such are low-pass filters, integrator networks, etc.

As to the kinds of capacitors which are used for filtering purposes, the power supply filter capacitors are mainly of the electrolytic variety at least at working voltages up to 450 volts. At higher voltages, paper dielectric units are used. At very high voltages, such as in the picture-tube, second-anode power supply, ceramic capacitors rated at from 10,000 to 20,000 volts working voltage are employed.

In circuits which are intended to control the passage of bands of frequencies, higher

than perhaps 500 cps, mica and ceramic, especially the latter see most service. Paper dielectric capacitors are used in great numbers for this function at audio frequencies.

Summary of Applications. These references to applications are of necessity very brief. Elaborations will appear at different places in this text, as the discussion of the different kinds of capacitors warrants.

Identification of Capacitors

How are capacitors identified? Identification is by means of the basic types first, then by the subdivisions of these types, and then finally by constants. Some constants are general in application, that is, will be found applied to all capacitors, whereas others are native only to certain specific varieties.

The family of main categories of capacitors and their subdivisions as applied to TV receivers is the following:

Air Dielectric

- Tuning capacitors (variable)
- Trimmer capacitors (variable)

Mica

- Foil, (fixed, postage stamp)
- Foil, (variable trimmers)
- Temperature compensating
- Foil, button
- Silver mica (fixed, postage stamp)
- Silver mica, button

Ceramic

- Tubular (fixed)
 - insulated
 - non-insulated
 - stand-offs
 - temperature compensating
 - feed-through
 - dual
- Disc (fixed)
 - single
 - dual
 - temperature compensating

Plates

- single
- multiple
- Door Knob (thick disc)
- Trimmers (variable)
 - tubular
 - flat (round)

Composition (fixed)

Paper Dielectric

- Tubular
 - Wax impregnated and cardboard case, wax sealed
 - Oil impregnated, cardboard case, wax sealed
 - Oil impregnated and molded case
 - Special impregnation, cardboard tube, molded seal
 - Metal cased (wax impregnated or oil impregnated)
 - Metal cased, hermetically sealed

Metalized Paper

Electrolytic

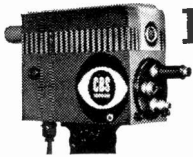
- Tubular (etched foil and plain)
 - cardboard case or metal case

(Continued on page 17)



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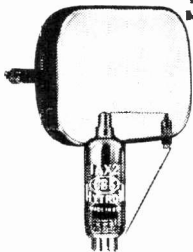
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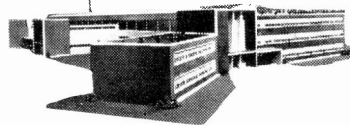
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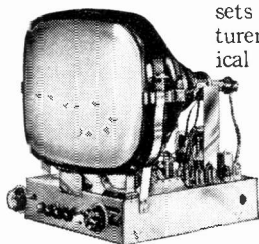
2. CBS-HYTRON SPECIALIZES IN RECEIVING TUBES. Since 1921, CBS-Hytron has concentrated on receiving types. Practice makes perfect. Put those years of know-how to work for you. Let time-proved CBS-Hytron dependability cut call-backs . . . make more money for you.



3. CBS-HYTRON LEADS IN TV TUBES. You know them. CBS-Hytron TV originals: 1AX2, 1X2A, 6BQ6GT, 12A4, 12B4, 12BH7, 12BY7, 12BZ7, 25BQ6GT, and the original rectangular 16RP4. Even CBS-Hytron standard TV tubes are designed-for-TV . . . tested-for-TV . . . to give you peak performance and profit.

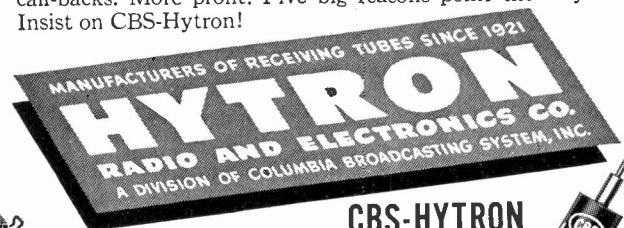


4. CBS-HYTRON IS ULTRAMODERN. CBS-Hytron is the tube of the future. Made in the world's most modern plants. On manufacturing equipment years ahead of the rest of the industry. CBS-Hytron advanced design and precision construction keep you always ahead. Give you tomorrow's trouble-free performance today.



5. CBS-HYTRON IS MATCHED-TO-THE-SET. Combined engineering skills of leading set makers and CBS-Hytron work hand in glove for you. CBS-Hytron tubes are originally set-engineered right into the sets of 9 out of 10 leading set manufacturers. No wonder CBS-Hytron is your logical matched-to-the-set replacement tube.

IT PAYS TO BE FUSSY! Just any standard brand won't do. If you want: Trouble-free, advanced performance. Maximum customer satisfaction. Minimum call-backs. More profit. Five big reasons point the way: Insist on CBS-Hytron!



**CBS-HYTRON
Germanium Diodes**

Complete data yours for the asking. Write CBS-Hytron, DANVERS, MASS., today.



HOW TO PLAN FAST-MOVING INVENTORIES AND REDUCE OBSOLESCENCE WITH IRC "BEST SELLERS"



Why Tie-up Your Money in Stagnant Stocks?

Resistors on your shelves won't bring you a cent—until you put them to use. If they're lazy movers they tie-up your money and your shelf space. And if they're shelf-squatters—gathering dust month after month until they become obsolete—they're actually money wasted. Yet a lot of servicemen continue to stock slow-moving parts because they haven't thought about the advantages of IRC "Best Seller" Resistors and Controls.



For Fast Stock Turnover

Invest in IRC "BEST SELLERS"

It's just as easy—easier in fact—to stock fast-moving, money-making parts as it is to load up with shelf-squatters. And it's certainly a lot more profitable. All you have to do is tell your Distributor's salesman that you want a realistic, commonsense inventory based on IRC "Best Sellers". He'll know what you mean, because ten-to-one your Distributor's own inventory is based on those very fast-moving parts.



What Do We Mean by "BEST SELLERS"?

"Best Seller" Resistors and Controls are those you use most often in radio and TV servicing. They're the indispensables—the ones you'll want on hand at all times. Of course there are others you'll need on occasion. But the great majority of parts essential in radio and TV divides into relatively few classifications regardless of brands or models of sets. Although IRC makes resistors and controls for every replacement need, careful analysis shows the greatest movement among a limited number of types and ranges. These "Best Sellers", listed here, provide a realistic base for establishing your parts inventory.



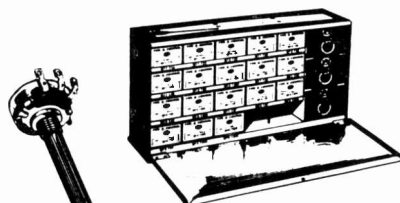
IRC Advanced BT Filament Type Resistors

In television sets you'll find more IRC Type BT's than any other types or makes of resistors. Fully insulated, they combine extremely low operating temperature and superior power dissipation. Not only do they easily meet the stiff requirements of television, they also beat Army-Navy Specifications in most characteristics. IRC supplies Advanced Type BT Resistors in a complete variety of ranges and sizes to meet every servicing need.



IRC Fixed and Adjustable Power Wire Wound Resistors

These rugged, long-life resistors are specially engineered for dependable heavy-duty performance. Unlike ordinary resistors, IRC PWW's need no derating; they carry full wattage in any range. Special coating gives faster heat dissipation, and special lead-lug arrangement permits easier installation in crowded chassis. IRC Power Wire Wounds are available in a full range of sizes and resistance values and terminal types.



Widest Replacement Coverage with Minimum Control Stocks

Most adaptable of all radio-TV technicians' volume controls, IRC Type Q Controls give you full replacement coverage with only nominal control stocks. IRC's exclusive Knob Master Shaft fits most push-on knobs without alteration except cutting to length. And IRC's Interchangeable Fixed Shaft feature allows fast control conversion to suit almost any radio or TV set. Handy IRC Volume Control Cabinet is the ideal way to buy and stock Q Controls. Cabinet stock of 18 controls handles over 90% of your single carbon control replacements.

Here are Your IRC "BEST SELLER" Resistors and Controls listed in order of popularity

TYPE BT RESISTORS	
Type	Value
BTS 1/2 watt	0.1 meg.
BTS 1/2 watt	0.47 meg.
BTS 1/2 watt	22,000 ohms
BTS 1/2 watt	1.0 meg.
BTS 1/2 watt	1000 ohms
BTS 1/2 watt	10,000 ohms
BTS 1/2 watt	1500 ohms
BTS 1/2 watt	0.22 meg.
BTS 1/2 watt	4700 ohms
BTS 1/2 watt	100 ohms

POWER WIRE WOUND RESISTORS	
Type	Value
1 3/4A 10 watts	10,000 ohms
1 3/4A 10 watts	5000 ohms
1 3/4A 10 watts	1000 ohms
1 3/4A 10 watts	200 ohms
1 3/4A 10 watts	100 ohms
1 3/4A 10 watts	75 ohms
1 3/4A 10 watts	15,000 ohms
1 3/4A 10 watts	2000 ohms
1 3/4A 10 watts	1500 ohms
1 3/4A 10 watts	2500 ohms

REPLACEMENT CONTROLS		
Stock No.	Ohms	Taper
Q13-133	0.5 meg.	C
Q13-137	1.0 meg.	C
Q11-133	0.5 meg.	A
Q11-137	1.0 meg.	A
Q13-139	2.0 meg.	C
Q11-123	50 K	A
Q13-137X	1.0 meg.	H
Q11-128	0.1 meg.	A
Q13-139X	2.0 meg.	H
Q13-130	0.25 meg.	C

Cash in on IRC "BEST SELLERS"



Ask your IRC Distributor to set up a sensible inventory for you, based on these fast-moving units. Also, get Catalog Bulletins DC1, DC5 and DC8 on these parts from your IRC Distributor—or send postcard to us for your copies. IRC "Best Sellers" can save you money!



Wherever the Circuit Says ~~~~

INTERNATIONAL RESISTANCE CO.

423A N. Broad Street, Philadelphia 8, Pa.

Notice to All Purchasers of:

RIDER'S TV 10

We have always prided ourselves on the accurate information we have made available to the servicing industry. To live up to this tradition we wish to correct certain discrepancies that crept into the replacement parts listings published in TV 10. Because we are anxious to give you thoroughly accurate replacement parts listings, which include additions that arrived after the publication of TV 10, we ask you to do the following:

Please fill in the registration coupon on the first page of your Rider TV 10 Manual and send it to us. We will forward the replacement parts listing corrections direct to your address. Also, by returning this coupon to us, you will be assured of having your name on our mailing list for exclusive information that will be available to TV 10 owners. Do Not send us the replacement parts pages!

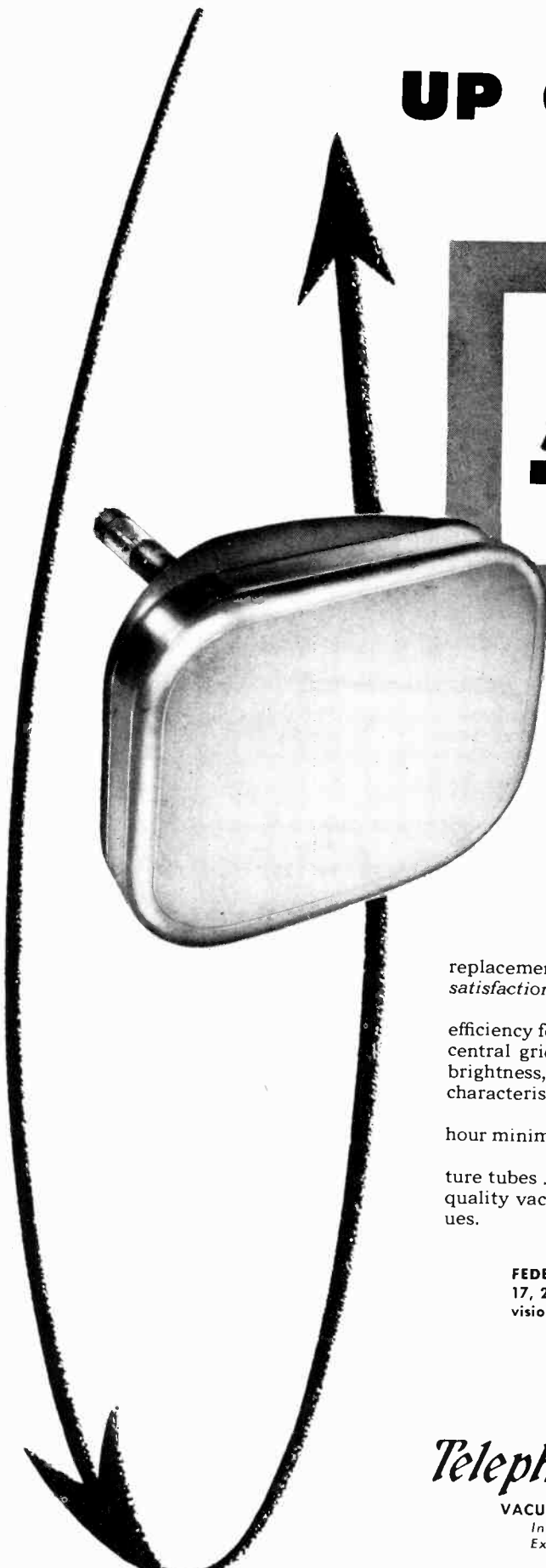
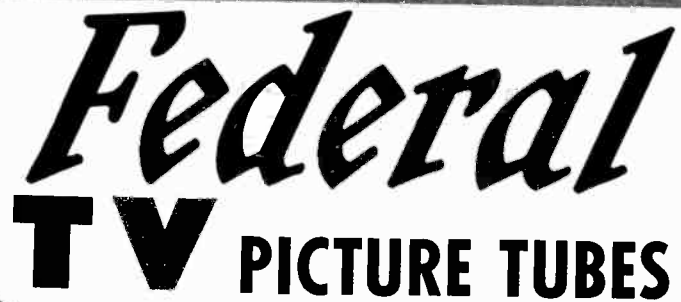
Look to future issues of SUCCESSFUL SERVICING for the newest additional replacement parts listings.

*John F. Rider,
Publisher*

DOWN GO CALL-BACKS

UP GO PROFITS

That's why...

Federal
TV PICTURE TUBES

**... ARE THE REPLACEMENT
CHOICE OF MORE AND MORE
SERVICEMEN**

**Federal tubes are designed right, made
right, factory-tested to the hilt... and
BACKED BY A YEAR'S GUARANTEE!**

FEDERAL is fast-growing in demand as a *profitable* picture tube replacement, because Federal goes the limit to assure your customers *steady satisfaction!*

Every Federal tube must measure up to exacting standards of efficiency for breakdown and stray emission (at max. ratings), ion trap current, central grid cut-off, zero bias beam current, focus voltage current, highlight brightness, leakages, shorts, gas ratio, screen and glass quality... plus other characteristics. Tests include the tough 500-hour operation run.

Moreover, a unique, prior-to-shipment check-up follows a 24-hour minimum storage period—an *extra provision for trouble-free performance!*

Start now to protect your replacement profits with Federal picture tubes... the tubes backed by decades of experience in producing highest-quality vacuum tubes for broadcast, military communications and other major uses.

Consult your Federal distributor for full information and prices.

FEDERAL POPULAR-SIZE TUBES INCLUDE: 12½ and 16-inch round; 14, 16, 17, 20 and 21-inch rectangular. Write for your free copy of Federal's Television Picture Tube Data Book.

Federal 
Telephone and Radio Corporation

VACUUM TUBE DIVISION • 100 KINGSLAND ROAD, CLIFTON, NEW JERSEY
In Canada: Federal Electric Manufacturing Company, Ltd., Montreal, P. Q.
Export Distributors: International Standard Electric Corp., 67 Broad St., N. Y.

"Federal always has made better tubes"

Please mention *Successful Servicing* when answering advertising.

uhf converters

(Continued from page 1)

Conversion Kit Part No. 43-6473 for R-F Chassis 81-84. The change-over switch supplied with the kit is installed on the back of the VHF tuner, and is operated by the actuator on the VHF tuner shaft. When the Channel Selector of the VHF tuner is turned to either Channel 2 or Channel 3 (see adjustment of the actuator below), the switch is thrown into the UHF position. In the UHF position of the switch the antenna input of the VHF tuner is switched to the output of the UHF tuner and, if a single antenna is used, the antenna is switched to the input of the UHF tuner. In this position the VHF pilot light is turned off and the UHF pilot light is turned on. When the Channel Selector is set to a channel other than the one on which the switch is thrown by the actuator, the switch returns to the VHF position. In this position the antenna is connected to the VHF tuner input, the VHF pilot light is turned on, and a 150,000-ohm resistor is connected in series with the B plus supply for the UHF oscillator. The resistor lowers the plate voltage of the UHF oscillator and puts the oscillator out of operation.

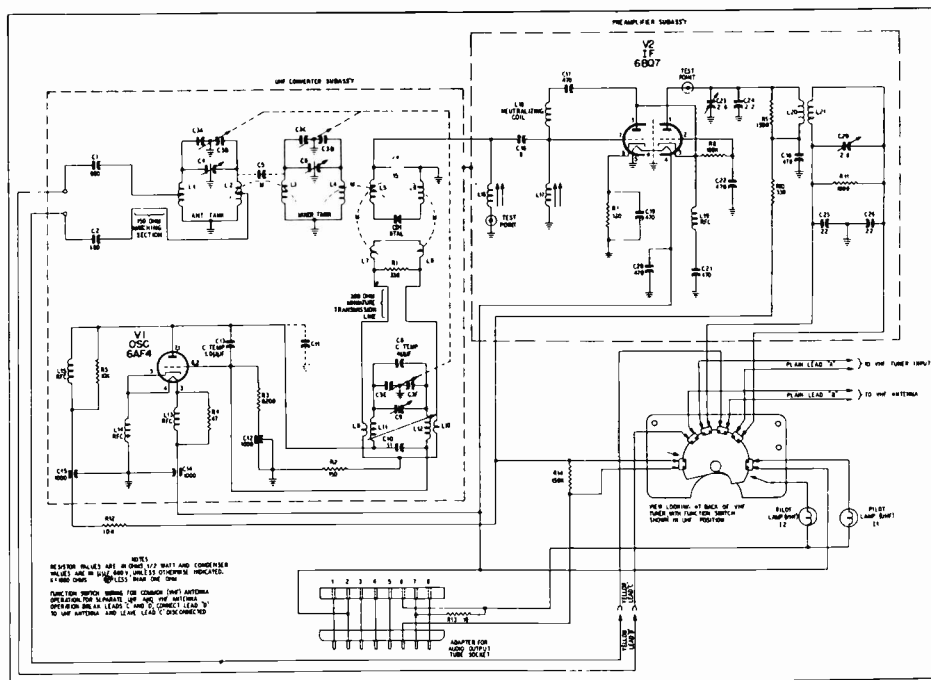
The adapter plug fits into the socket of the audio output tube, with the tube inserted into the socket of the adapter. This adapter supplies B plus, B minus, and filament power connections for the UHF converter. The adapter plug and socket is used in field-installed kits only. In factory-installed kits the cable is wired directly into the r-f chassis.

The UHF tuner is tuned by means of a 3-gang tuning condenser, which is driven through a specially designed planetary drive. The planetary drive is constructed so that fine tuning and coarse tuning can be accomplished with one knob. The tuning shaft is coupled to the driving shaft through three balls which form a planetary drive for fine tuning. After rotating 180 degrees with the tuning shaft, a pin engages the driving shaft, and the two shafts are direct-coupled, for coarse tuning. To re-engage the planetary drive for fine tuning, it is only necessary to reverse the direction of rotation. The dial pointer is connected to the tuning gang through a cord drive, and indicates the channel number to which the tuner is tuned.

The RCA UHF Selectors

Model U2. UHF Selector Model U2 permits the reception of any two UHF television stations within receiving range when employed with a VHF television receiver.

The unit employs two tubes, a crystal rectifier and a selenium power rectifier. The unit is housed in a small metal cabinet and is operated by a single control knob.



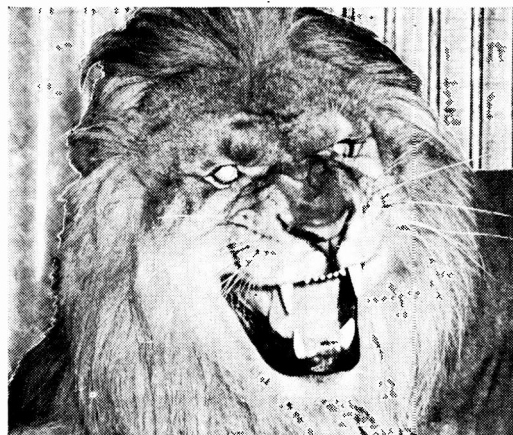
Courtesy Philco

Fig. 2. Schematic Diagram, Philco UHF Converter for R-F Chassis 81 and 84.

Television R-F Frequency Range	Weight and Dimensions
All 70 UHF television channels470 mc.	Net Shipping Weight Width Height Depth
to 890 mc.	5 6½ 8⅝ 4⅞ 7⅝
I-F Output FrequencyChannel 5 or 6	
Power Supply Rating	

(Continued on page 23)

Laughs in the Life of a TV Serviceman



"... just as he caught a right to the jaw the picture started rolling and didn't stop till the commercial!"

IF HE'D only adjusted the vertical hold control—that's all it was. And anyway, if it had been serious, Raytheon TV is easy to service.

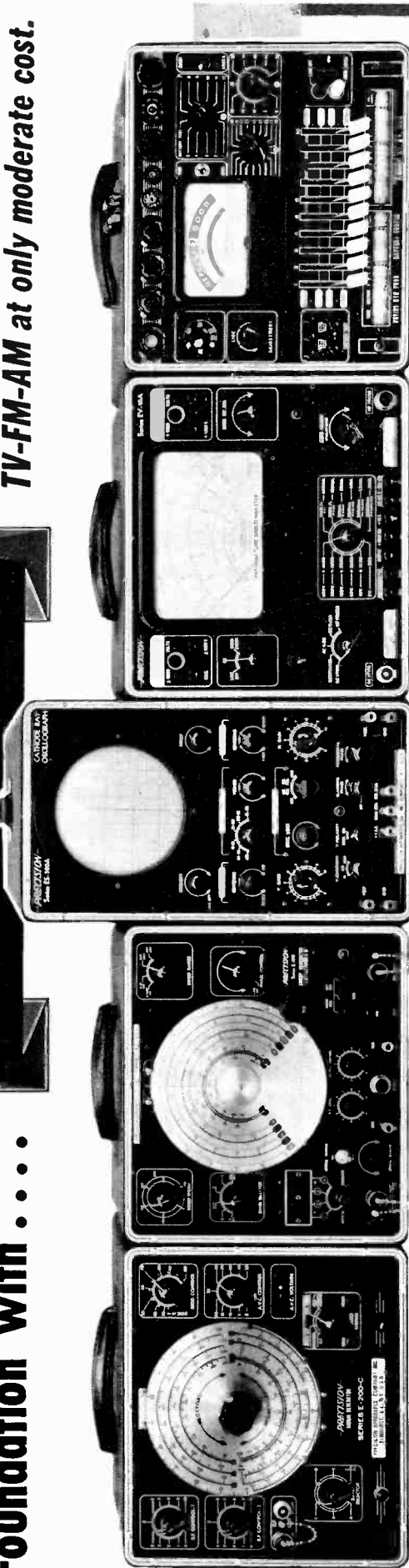
Besides furnishing complete Service Manuals with condensed service tips, Raytheon originated the famous "How to Interpret What You See" program, seen by over 40,000 servicemen. This popular 90-minute

show uses two slide films—one shows defective TV pictures, the other schematics of affected circuits. An experienced technician explains how to fix the trouble. Write for FREE copy of *How to Interpret What You See*, which gives you basic clinic material. Address Raytheon Television and Radio Corp., 5921 West Dickens Ave., Chicago 39, Ill.

**★ Build Your Service-
Sales Future on a Firm
Foundation with**

**PRECISION
TEST EQUIPMENT**
Standard of Accuracy...

**... These 5 Matched "Precision"
Instruments provide a Complete
MODERN SERVICE LABORATORY for
TV-FM-AM at only moderate cost.**



**SERIES E-200-C—Modern Multi-Band
SIGNAL and MARKER GENERATOR
for A.M., F.M., and TV alignment.**

Exceptional Accuracy and Stability! 1000 pt. vernier calibrating scale 0-100%. Modulation! A.V.C. — A.G.C. substitution-override network! Direct reading 88KC to 120 MC! Complete with Coaxial output cable and technical manual! In matched, heavy gauge steel case 10 1/2 x 12 x 6".

Net Price: \$73.25

**SERIES E-400 — Wide Range H.F.
SWEEP SIGNAL GENERATOR**
Direct Reading from 2 to 480 MC.

Narrow and Wide Band Sweep for F.M. and TV. 0-1MC and 0-15MC • 1500 pt. vernier calibrating scale • Multiple Crystal Marker • 8 tubes including V.R. and rectifier • RG/82U Coaxial Terminated Output cable • Complete with 2 crystals • In matched copper-plated case 10 1/2 x 12 x 6".

Net Price: \$135.75

**SERIES ES-500A — 20 MV.
High Sensitivity, Wide Range
5" C.R. OSCILLOGRAPH.**

Push-Pull "V" and "H" amplifiers • 1 MC Band Width • High impedance, compensated "V" input Step Attenuator • Z axis modulation • 12 tubes incl. V.R. and 2 rect. • Light Shield and Mask • Heavy Steel Case. 8 1/4 x 14 1/2 x 18".

Net Price: \$173.70

**SERIES EV-10A — High Sensitivity
True Zero-Center VTVM—MEG OHMMETER
— with large 7" meter.**

58 ranges to 6000 Volts, 2000 Megs. —70DB, 12 Amps • Direct Reading R.F. VTVM scales via optional RE-10A High Freq. probe • Voltage Regulated bridge type circuit • Constant 13 1/2 Megs. input resistance to 600 V. 133 1/2 Megs at 6000 V • Complete with test cables and manual • Matched heavy gauge steel cabinet 10 1/2 x 12 x 6"

Net Price: \$97.20

**SERIES 612 — Modern Free-point
Cathode Conductance TUBE TESTER,
and dynamic A-B-C Battery Tester.**

Incorporates RTMA recommended circuit principles! 10 lever free-point element selection! Built-in roller chart! Dual short-check sensitivity! Noise, Ballast and Pilot Tests! Free replacement tube test data chart service! Complete, ready to operate! In matched heavy gauge steel cabinet 10 1/2 x 12 x 6".

Net Price: \$72.75

BUY PERFORMANCE— NOT SPECIFICATIONS!— BUY "PRECISION"

"PRECISION" PERFORMANCE, ACCURACY, WORKMANSHIP and VALUE have been setting a standard of comparison for over 15 years. DO NOT BE MISLED. It is not "PRECISION" test equipment unless it is manufactured by Precision Apparatus Co., Inc., Elmhurst, L. I., N. Y.

OTHER MATCHED COMBINATIONS

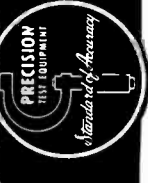
The instruments shown above illustrate one of many possible MATCHED COMBINATIONS of diversified "PRECISION" Test Equipment for TV-FM-AM. Each combination provides a selected and basic, modern, efficient laboratory at moderate cost.

SERIES TV-4— Super-High Voltage Safety Test Probe.

Extends range of Series EV-10A (above) to 60 KV direct reading, with full safety to operator and equipment. Multiplier cartridges also available to match most VTVM's and 20,000 ohms/v. test sets.

Series TV-4: — Complete, for use with EV-10A.

Net Price: \$14.75



PRECISION APPARATUS CO., INC.

92-27 Horace Harding Boulevard, Elmhurst 14, New York
Export Division: 458 Broadway, New York, U.S.A. • Cables—Mohanex
In Canada: Atlas Radio Corp., Ltd., Toronto, Ontario

"Precision" Performance — Engineered Instruments are on display at leading radio parts and equipment distributors.

Convenient "Precision" Purchase Terms can be arranged with your favorite authorized Precision Distributor.

AM • FM • TV • AM • FM • TV

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Please mention Successful Servicing when answering advertising.

A 3rd and 4th "School of Thought" on Front-End Tuner Service

RCA SERVICE CO., INC.
A RADIO CORPORATION
OF AMERICA SUBSIDIARY
CAMDEN 2, NEW JERSEY

October 17, 1952

Mr. John F. Rider
John F. Rider Publisher, Inc.
480 Canal Street
New York 13, New York

Dear Mr. Rider:

I want to commend you on your very fine article on "Front End Tuner Service" which appeared in the September, 1952 issue of **SUCCESSFUL SERVICING**. The treatment you have given the "two schools of thought" on this important service is indeed thought provoking. However, I want to point out a third school of thought which I believe you will find interesting.

We—and perhaps others—have a tuner exchange arrangement which we believe is not only economical but permits rendering of complete tuner service with the least possible delay. This plan provides for stocking our distributors with RF tuners for ready use to replace defective tuners. Thus, a serviceman may exchange a tuner taken from a customer's set for a stock tuner. For this, he pays a nominal flat rate.

The outstanding merit of this plan, in addition to the moderate charge, is that it assures the serviceman a high standard of performance on tuners which have been overhauled in the field under factory controlled methods.

In our own repair activities of the tuner, we have established a standardization of the required jigs, tools, test equipment and replacement parts. This enables us to give each tuner a complete checkout under actual operating conditions as a final check and at a minimum cost.

Our service is truly invaluable to the average serviceman, who usually does not have the needed variety of jigs, parts and test facilities for the various types of tuners he may deal with.

We, therefore, feel that under this "third school of thought", the customer and the serviceman are best served with tuner repair centers on an exchange basis. This, of course, spells the best in all around service on this important component.

As has been our custom, we will continue to cover the RF tuner in our detailed service notes for those servicemen who wish to make the repairs themselves.

Very truly yours,
C. M. Rigsbee, Manager
Commercial Service Section

RAYTHEON TELEVISION AND RADIO CORPORATION

A SUBSIDIARY OF RAYTHEON MANUFACTURING COMPANY
5921 W. DICKENS AVE. CHICAGO 39, ILLINOIS

October 23, 1952

Mr. John F. Rider
480 Canal Street
New York City 13, New York

Dear Mr. Rider:

It was with great interest that we at Raytheon read in "Curtain Time" your comments regarding tuner repairs. We believe that no specific remarks on tuner repairs in general can be made, but that on a particular type or make, a generalized answer is warranted.

The Raytheon tuner was devised with three main objects in mind, to be extremely sensitive electrically, to be exceptionally rugged mechanically and have ease of serviceability. This combination has resulted in a product which is, we believe, unsurpassed in its high efficiency and trouble-free service.

A tuner cannot be considered as a component in the same sense as a transformer or resistor. It is just another device with electronic components which form circuits with all the usual performance variations, and thus subject to all the usual non-performance tests.

A competent technician using factory replacement parts with the requisite equipment for RF alignment (equipment which a good service organization should have) and a little extra care in lead dress and component replacement are the only factors which control successfully, time and money saving repair on our tuners. By carrying in stock a small complement of replacement parts, he can, at low inventory cost be in a position to service successfully any of our VHF tuners.

The tuner can easily be serviced by removing the three (3) hex head nuts holding the bottom cover in place. Removing the bottom cover makes all the tuner components within easy reach and all parts can be serviced. It is suggested that after the bottom cover is removed, the tuner be inspected for burnt parts, solder splashes, and defective solder connections. When working inside the tuner do not move components a great distance as a change in distributed capacity will result and offset the alignment.

A majority of tuner troubles are often open or high resistant ground, coil or solder connections. These can easily be repaired by placing a hot soldering iron at the solder connection.

Since the tuner is small and compact, it is suggested that a long, small diameter tipped soldering iron be used to prevent damage to surrounding components. Do not over-heat trimmer condensers
(Continued on page 17)

TELL-A-FAULT

is

A BIG HELP

"to the serviceman, especially those of us who are new to TV servicing."

Harry J. McBride
7125 Woodrow Ave.
St. Louis 20, Mo.

"it is as essential as test equipment and tools."

Hugo Bonavita
2330 Symmes Ave.
Cincinnati, Ohio

"I can hardly wait for the succeeding issues."

Eugene L. Weidenbach
408-16th St.
Brooklyn 15, N. Y.

NEED WE SAY MORE!

These comments are from servicemen just like yourself who are using TELL-A-FAULT in their everyday servicing work. They have found that TELL-A-FAULT does their troubleshooting for them. It can do the same for you!

This quadruple-threat service consists of:

- (1) time-saving pictorial, symptom and cure sheets
- (2) fault pinpointing circuit guides
- (3) servicing-techniques short cuts
- (4) how to use all sorts of test equipment

Save anywhere from 50 to 200 hours of troubleshooting time per year by using this practical service based on symptoms rather than circuitry. It completely removes the guesswork in locating receiver troubles by rapidly locating the faults and giving you the proper cures.

TELL-A-FAULT is only a few months old, but the idea has caught on with thousands of progressive service technicians throughout the country.

The entire service costs you less than twenty cents a week. You receive a full 12 month's TELL-A-FAULT for only \$10.00.

Start your subscription today! We'll send you your TELL-A-FAULT binder, subject separators and all the installments that have been released to date. For full information on the most unique SERVICE ever made available to TV and radio service technicians—write to Dept. TF 7.



JOHN F. RIDER
PUBLISHER INC.
480 Canal St. N. Y. 13, N. Y.



for greater speed and
accuracy of TELEVISION INSTALLATIONS
in any locality use the new

Simpson

MODEL 488

TV FIELD STRENGTH METER

In addition to location of maximum signal areas, the Simpson Model 488 Television Field Strength Meter is also ideal for antennae orientation, comparison of antennae systems, adjustment of TV signal boosters and checking antennae and lead-in installations to list but a few of the many functions available . . . THE 50 MICROVOLT FULL SCALE RANGE IS AN OUTSTANDING FEATURE FOR THOSE CONCERNED WITH FRINGE AREA INSTALLATIONS WHERE MAXIMUM EFFICIENCY MUST BE ATTAINED . . . The 500, 5,000 and 50,000 microvolt ranges extend the usefulness of the Simpson Model 488 into areas of higher signal strength. The large 4½-inch modernistic meter is easily read from a considerable distance and all controls and connections are arranged for greatest accessibility. Model 488 is housed in a beautiful gray hammerloid finished case for greater portability. LINE VOLTAGE: 105-125 volts, 50-60 cycles. SIZE: 8" x 11" x 8½".

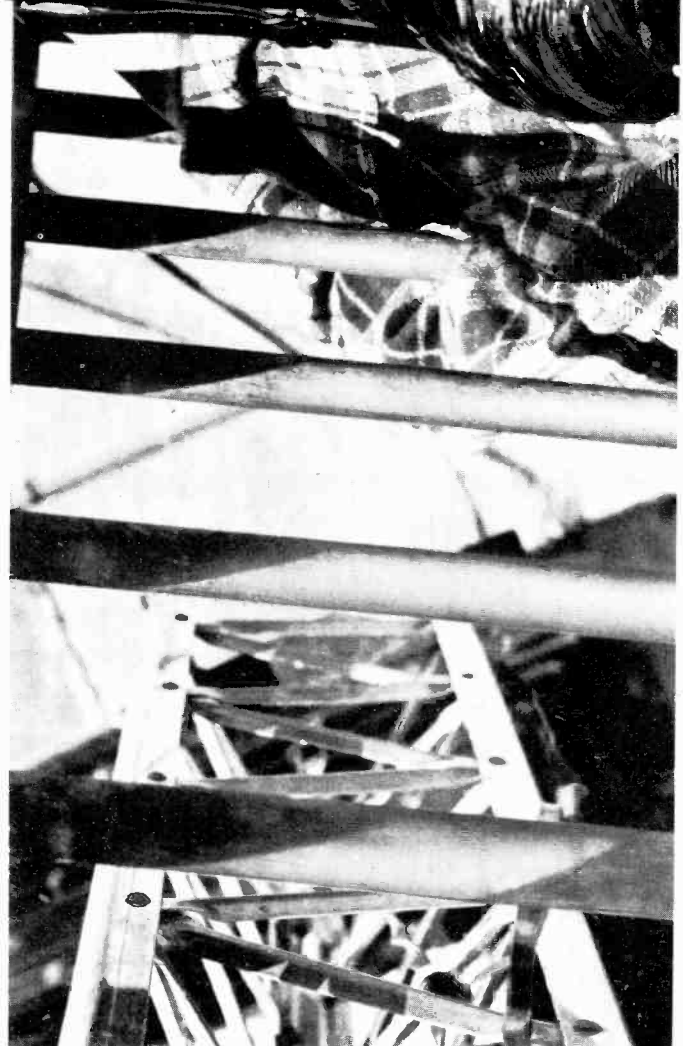
WEIGHT: 11½ lbs. Shipping weight 15 lbs.
DEALER'S NET PRICE, including operating instructions and shoulder strap . . . \$89.50

SIMPSON ELECTRIC COMPANY

5200 WEST KINZIE STREET, CHICAGO 44, ILLINOIS

Phone: COLUMBUS 1-1221

In Canada: Bach-Simpson, Ltd., London, Ontario



Checking Electrolytic Capacitors

Experimentation shows that if the series resistance of the output section of the filter capacitor is as much as 6 ohms, the set will oscillate and produce a noticeable hiss. If the resistance is as much as 15 ohms, the receiver will squeal and motor-boat. Sometimes this trouble is not easily traced to the filter capacitors. The usual method for locating the trouble is to have the set playing on a station where the oscillation is present and bridge the filter condensers with another capacitor of the same value. All too often when this is done the shock of bridging the additional capacitor in the filter circuit will cause the oscillation to stop, and it may not reappear when the additional capacitor is removed from the circuit. A good way to avoid this is to use a two or three thousand ohm wire wound potentiometer in series with the test condenser. With the pot set in its maximum resistance position the test capacitor is connected across the suspected filter capacitor. Due to the high resistance of the pot the test capacitor charges slowly and the operation of the receiver is not disturbed. The resistance of the pot is slowly decreased until the test capacitor is connected directly across the suspected filter capacitor. This method has proved of considerable value in pinning down this type of filter trouble.

C. J. Overall

A 3rd and 4th "School of Thought" on Front-End Tuner Service

(Continued from page 15)

as the insulation will melt. Avoid using excess solder, as solder splashes may result and cause damage to the tuner.

Tube sockets are extremely difficult to replace and therefore, it is not recommended. Broken tube socket pins can be easily replaced by carefully removing the broken pin parts, and inserting a new pin from the top of the socket. Loose tube socket pins may cause intermittent operation when the tube is jarred or moved. This condition can be remedied by carefully bending or squeezing the top of the pin contacts together with a sharp instrument. Rosin on the socket pins may also cause intermittent operation. This can be rectified by filing the tube pins which will leave a slight burr and insure good contact.

In conclusion, a factor we believe to be of utmost importance is the fact that our tuner has only four (4) movable contacts. These may be replaced in seven easy operations, taking under three minutes flat. We believe it to be automatic, that the smaller the number of contacts, the better the reception and the fewer the service problems.

Yours very truly,
RAYTHEON TELEVISION & RADIO CORPORATION
Frank Loasby
Sales Engineering Dept.

Replacement Parts in TV Receivers

(Continued from page 8)

- single section
- multiple section
- Can type (etched foil or plain)
- twist lug
- single section
- multiple section
- screw-in
- single section
- multiple section
- Plug-in (etched foil and plain)
- single section
- multiple section

The branches of the capacitor family tree represent physical differences and electrical differences. We acknowledge that all features are of interest to the servicing industry, but a complete resume is impossible because of space limitations. Of greater concern are those details which relate to uses and replacements, hence pertinent constructional features will be discussed briefly in connection with the electrical characteristics.

The illustrations of the physical shapes of the different varieties of capacitors bear ranges of physical dimensions. No one brand is indicated by these sizes. As far as original equipment is concerned, that is, parts used

in receivers, the size selected by the set designer is one which is determined by two factors; supply, and the space available in the receiver. This tends to set a limit on the variety of sizes because the prime producers of these units manufacture items of like capacitance and voltage values in substantially the same physical dimensions, and also because the general dimensions of TV chassis are very much alike. Of course, when housing quarters are crowded, size is an important factor — but never losing sight of the electrical requirements.

Constants of Capacitors

The constants of capacitors are numerous. An appreciation of their meaning by the servicing industry is important to successful operation. Not that service technicians have facilities for the determination of these constants, rather it means a better understanding of the entire replacement problem. Moreover, it gives more meaning to the specifications applicable to capacitors.

This is the second in a series of articles on "Replacement Parts in TV Receivers." Will be continued next month.

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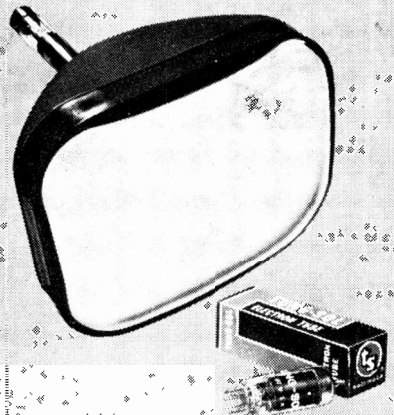
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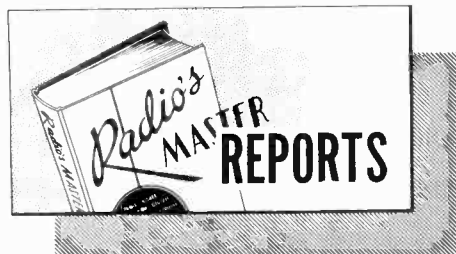
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A monthly summary of product developments and price changes of radio, electronic, and television parts and equipment, supplied by United Catalog Publishers, Inc., New York City, publishers of RADIO'S MASTER.

These REPORTS will help you to buy and sell to best advantage. They will also help you to keep your inventory up to date. A complete description of most products will be found in the Official Buying Guide, RADIO'S MASTER available through local parts distributors.

COMMENT: There is an apparent trend toward increased prices by the leading TV tube manufacturers. While "change activity" continues to center around the introduction of new items, it is noticeable at this time that there is a decrease in the number of manufacturers involved.

New Items

- with N-1600A network at \$156 net and No. S-20, packaged public address system at \$275.00 net.
- AMERICAN PHENOLIC CORP.**—Added 500 and 1000 foot lines to their twin-lead transmission line series No. 14-023 and No. 14-079.
- A.R.R.L.**—Introduced new publication, "Gateway to Amateur Radio", sold as a 4-book unit containing: "How to Become a Radio Amateur"; "The Radio Amateur's License Manual"; "Learning the Radiotelegraph Code"; and "Operating an Amateur Radio Station", at \$1.25 net.
- ARCO ELECTRONICS**—Introduced ceramic disc capacitor series CCD and CCDN used primarily for coupling and by-pass in RF and higher frequency circuits; wax impregnated with low-loss phenolic coating; voltage rating 1500 VDCT, 500 VDCW. Also feed thru capacitor series CCF designed for high frequency coupling with a minimum of inductive reactance through elimination of wire leads.
- BIRNBACH RADIO**—Introduced No. 6261 at \$1.41 net and No. 6263 at \$1.41 net. Both are bat handle center off switches of molded bakelite, rated at 3 amps, 250 volts.
- HALLDORSON TRANSFORMER**—Introduced No. DF604, deflection yoke at \$6.45 net . . . No. FB405, FB406, horizontal deflection, and H.V. flyback transformers at \$4.59 and \$4.71 net respectively.
- JACKSON ELECTRICAL INSTR.**—Added Model 710, selenium rectifier test set at \$29.50 net. This pocket size unit tests all selenium rectifiers rated from 20 to 650 ma and has a variable indicated voltage range from 25 to 300 volts ac. It is designed to operate on 110 to 125 volts ac and includes "line adjust" control to give more accurate readings.
- JERROLD ELECTRONICS**—Added three new high Q interference traps, No. TLB, TFM, THB, each at \$25.00 net.
- JONTZ MFG.**—Added Model E in their series of roof mounts, a package of 5 complete mounts and bolts at \$3.25 net.
- LITTELFUSE**—Added No. 30307.5, 7½ amp fuse in their 7AG fuse series.
- MERIT TRANSFORMER**—Added No. HVO-9 to their TV component series of horizontal output and hi-voltage transformers at \$6.00 net.

- PORCELAIN PRODUCTS**—Introduced a series of porcelain lead-in tubes for UHF TV cable. This set of lead-in tubes comes in 7 different lengths, and its snug fit prevents entry of rain or insects.
- R.C.A.**—Added TV component part No. 232T1, universal type horizontal deflection transformer (auto. trans. type) at \$6.30 net . . . receiving tubes 6BQ/A at \$3.05 list and 6C8 at \$2.90 list.
- RADIO MERCHANDISE SALES**—Introduced a number of economy V-type antennas, window antennas, and stacked 5 element Yagi antennas.
- RAYTHEON**—Introduced receiving tubes 6CL6, miniature version of type 6AG7, a 9-pin miniature pentode designed for use as a video amplifier in TV receivers at \$2.90 list . . . 12BZ7, a 9-pin miniature, high-mu dual triode designed for use as a sync separator in TV receivers at \$2.40 list and 25AV5G1, a beam pentode power amplifier designed for use as a horizontal deflection amplifier in TV receivers at \$2.90 list. Also introduced 17JP4, TV picture tube employing magnetic focus and deflection and designed to be used with an external ion trap magnet at \$26.00 net.
- RIDER, JOHN F.**—Added No. 142, "High Fidelity Simplified" at \$2.50 net.
- SCALA RADIO**—Added Model BZ-123, (a combination of Models BZ-1, BZ-2, BZ-3, containing a signal tracing probe, a low capacity probe, and a 100:1 voltage divider probe,) at \$27.50 net. Also introduced Model BZ-C, a spare or replacement low capacity calibrated coaxial cable for any of the above probes at \$1.00 net.

Discontinued Items

- AMER. TELEVISION & RADIO**—Discontinued several standard and heavy duty radio inverters and their series of standard and heavy duty industrial inverters.
- HALLICRAFTERS**—Discontinued Model S-80, supersensitive battery radio for remote areas.
- JOHNSON CO. E. F.**—Discontinued four radio frequency chokes, No's. 101-760, 102-750, 102-752, 102-754.
- NATIONAL CO.**—Discontinued Model HFS, VHF receiver and the six HFS plug-in coils that tuned the receiver to 6 bands.
- R.C.A.**—Discontinued receiving tubes 6AR5 and 6K8G.
- RADIO MERCHANDISE SALES**—Discontinued a number of 4 element Yagi antennas and several double driven 4 and 5 element Yagis.

- RECOTON**—Their series of juke box osmium phononeedles has been discontinued.
- TRIO MFG.**—Discontinued their controlled pattern antenna system series . . . their two-channel coverage Yagi antenna series and a number of models in their double dipole, five element Yagi series.

Price Increases

- AMERICAN PHENOLIC CORP.**—Increased price on No. 21-199 series of transmission line.
- G.E.**—Increased price on three 10", two 12", one 14", four 16", seven 17", three 20", three 21", one 24", and one 27" TV picture tubes.
- HALLICRAFTERS**—Increased price on a number of items including Model SA-62, all-wave listener receiver to \$299.50 amateur net price and Model S-76, double conversion receiver to \$179.50 amateur net price.
- R.C.A.**—Price increases on 5W4GT, radio receiving tube to \$1.75 list and No. WS-18A, rack-adaptor panel to \$11.50 net.
- RAULAND CORP.**—Increased price on two 10", two 12", two 14", seven 16", four 17", two 19", two 20", and two 21" TV picture tubes.
- RAYTHEON**—Price increases on two 10", three 12", two 14", five 16", three 17", three 20", one 21", and one 24" TV picture tubes.
- RIDER, JOHN F.**—No. 134, "TV and Other Receiving Antennas" increased to \$6.90 net.
- WESTINGHOUSE**—Increased TV picture tubes 16AP4-A to \$46.00 suggested list . . . 16GP4-B to \$46.00 suggested list . . . 17GP4 to \$42.00 suggested list and 19AP4-B to \$59.00 suggested list.

Price Decreases

- AMERICAN ELECTRICAL HEATER**—Decreased price on No. 3798, copper tip for very heavy operation soldering iron to \$1.689 net.
- AMERICAN PHENOLIC CORP.**—No. 82-843, RF connector decreased to \$5.40 net.
- CREST LABS.**—Decreased prices on cathode ray tube rejuvenators Model C, to \$2.40 net and Model D to \$2.79 net.
- JERROLD ELECTRONICS**—Decreased price on No. C-61, coaxial cable connector to \$4.48 net.
- JONTZ MFG.**—Decreased price on 3 items in their Model 200 "super" kwick climb tower series. The 50 foot tower with foundation mountings reduced to \$82.50 net . . . 10 foot top section to \$18.50 net and 10 foot mid sections to \$16.00 net.

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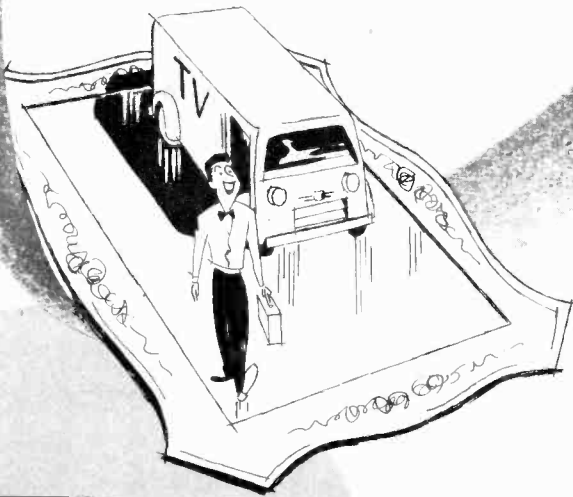
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uhf converters

(Continued from page 13)

Antenna Input Impedance

- UHF—Choice: 300 ohms balanced or 72 ohms unbalanced.
- VHF—300 ohms balanced.

Tube Complement

Tube Used	Function
CK 710	Crystal Mixer
6BQ7	R-F Oscillator
6CB6	I-F Amplifier

The UHF Selector has been designed to operate from either of three types of antenna installations. It will operate from the VHF antenna, or from a separate UHF antenna with 300 ohm transmission line or from a separate UHF antenna with 72 ohm co-ax transmission line.

In all cases, the VHF antenna transmission line must be disconnected from the VHF receiver and reconnected to the selector VHF antenna terminals. A short length of 300 ohm line must then be connected between the VHF receiver antenna terminals and the selector terminals marked "Receiver."

Model U70. UHF Selector Model U70 permits the reception of any UHF television station within receiving range when employed with a VHF television receiver. The unit employs three tubes plus rectifier and a crystal mixer.

Television R-F Frequency Range

All 70 UHF television channels..... 470 mc. to 890 mc.

I-F Output FrequencyChannel 5 or 6

Power Supply Rating.....115 volts, 60 cycles, 40 watts

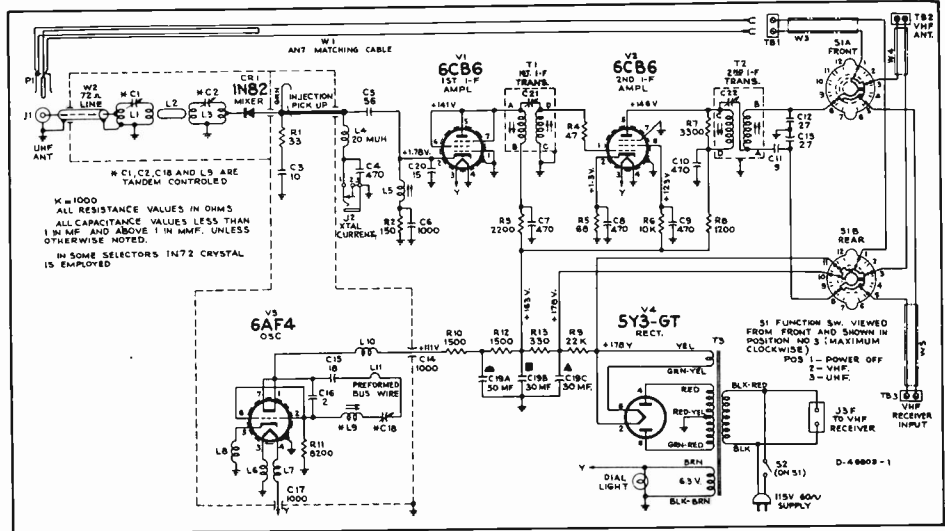


Fig. 4. Schematic of RCA U70 UHF Selector.

Courtesy RCA

Weight and Dimensions

Net Weight	Shipping Weight	Width Inches	Height Inches	Depth Inches
10 lbs.	12 lbs.	11 1/2	8 1/4	9 3/4

Antenna Input Impedance

- UHF—Choice: 300 ohms balanced or 72 ohms unbalanced.
- VHF—300 ohms balanced.

Tube Complement

Tube Used	Function
6AF4	R-F Oscillator
1N82	Crystal Mixer
6CB6	1st I-F Amplifier
6CB6	2nd I-F Amplifier
5Y3GT	Rectifier

The UHF Selector has been designed to operate from either of three types of antenna installations.

In all cases, the VHF antenna transmission line must be disconnected from the VHF receiver and reconnected to the selector VHF antenna terminals. A short length of 300 ohm line must then be connected between the VHF receiver antenna terminals and the selector terminals marked "Receiver."

UTP1 Sarkes Tazian Self-Powered UHF Translator.

Input Pre-set to any one UHF station —UTP1A (470-710) mc. — UTP1B (700-890) mc. Output into balanced 300 ohms, channel 2 to 6 inclusive.

This translator will provide satisfactory UHF reception in the many areas which will be served by a UHF station. It works in conjunction with a TV Receiver of any type, bringing a new station through one of the unused low channels.

In order to install this translator it is not necessary to get into the TV Receiver at all. It can be conveniently placed on the back of the set and need be connected only to the external antenna terminals of the receiver. As it is self powered it does not place added drain on the receiver power supply.

The receiver itself operates normally as when receiving a low channel. This makes it possible to take advantage of the full gain and performance of the VHF receiver when receiving UHF.

A switch button featured with this translator performs the following functions:

- It turns the translator on or off.
- It connects the translator output to the TV set or it disconnects it thus leaving the set undisturbed and capable of receiving the 12 VHF channels.
- It connects the presently used VHF antenna to the translator in case it is found to be satisfactory for UHF reception.

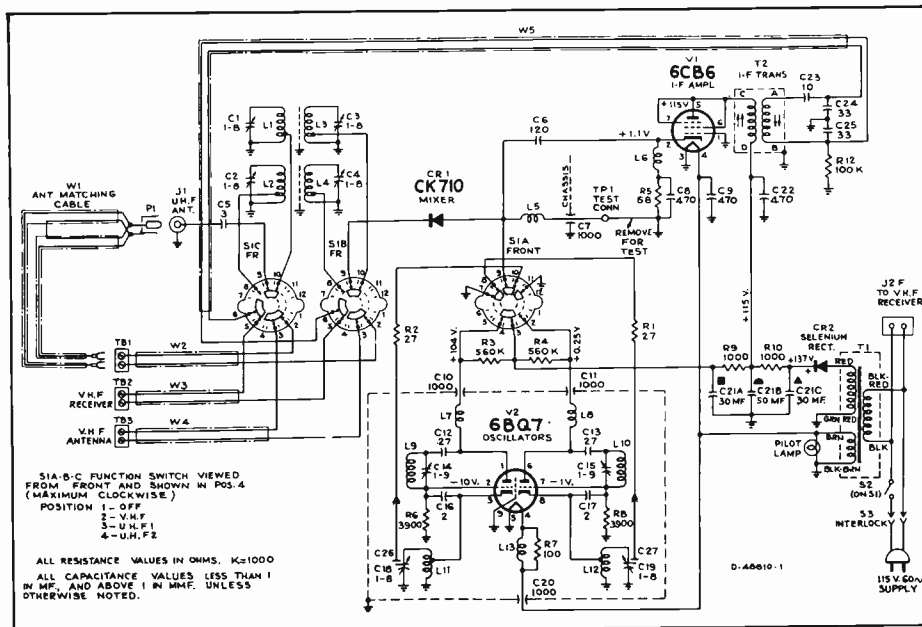


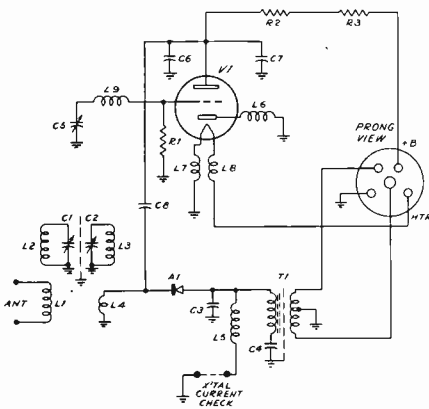
Fig. 3. Schematic of RCA U2 UHF Selector.

Courtesy RCA

(Continued on next page)

uhf converters

(Continued from page 23)



Courtesy Sarkes-Tarzian

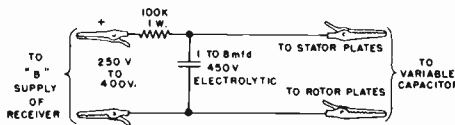
Fig. 5. Schematic of the Sarkes-Tarzian UHF Translator.

It disconnects the VHF antenna and grounds it to prevent interference and, at the same time, it connects a UHF antenna to the translator, should a UHF antenna be found necessary.

The complete range of frequencies and antenna switching possibilities makes this translator completely universal in application.

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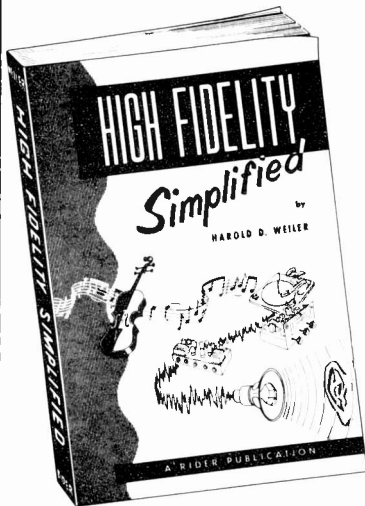
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by Harold D. Weiler



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