



Service News

A PUBLICATION OF THE RCA ELECTRON TUBE DIVISION

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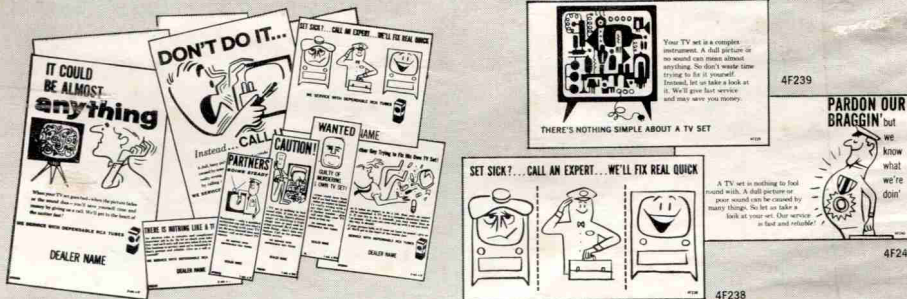
SERVICE-DEALER SUCCESS STORY

In Orchard Lake, Mich., a suburban community on the outskirts of Detroit, service-dealer John L. Peer has been extremely successful in his local competition with drug- and hardware-store "do-it-yourself" tube checkers.

The proud possessor of an RCA WT-110A Automatic Electron-Tube Tester, this owner-manager of the Peer Appliance Co. credits his free tube-testing service with substantially increasing his in-store sales volume by drawing into his shop an ever growing number of new or regained customers — 75% of whom, he claims, do not leave his store without making a purchase.

According to Mr. Peer, who has been in the service business for more than a quarter of a century, most "technically-minded" consumers appreciate the speed, security, dependability and professional handling of the RCA illuminated-card system, while they are losing interest in the mechanical settings and dial-manueverings of the competitive "do-it-yourself" service devices.

Since he bought the WT-110A early in 1958, he has sold many a tube to shoppers who have turned to him for his tube-testing and technical guidance even after they had previously checked the same tubes on "do-it-yourself" machines.



To stimulate consumer interest in free tube-testing services, such as that offered by Peer Appliance Co., Orchard Lake, Mich., service-dealers can employ the advertising and sales promotion materials comprised in RCA's "Quick—Call an Expert!" campaign, available from local RCA tube distributors. As shown above, this program features a collection of dealer ad mats (4F224A-Q) and three direct-mail postcards (4F238, 4F239, and 4F240). It also includes an 11- by 19-inch illuminated sign (4F92), a three-color transparent window streamer (4F30), a 30- by 40-inch litho display (4F100), and a consumer leaflet (4F94-A) that explains why tubes should be tested by an expert.

Vol. 24, No. 4

Electronics Servicing is Big Business

by R. B. Sampson

Manager, Market Research
RCA Electron Tube Division

[This issue's column is the first of a two-part feature article based on an address (entitled, "Are You Making Any Money?") delivered by Mr. Sampson at a recent meeting of the Electronic Service Dealers Association of Harrisburg, Pa.]

Apart from the technical problems and selling techniques of electronics servicing, there is another side inherent to the business—and that is the management of a service-dealer business in a manner which will produce a maximum return on investment. To state it in its simplest terms: to make money.

What is "service management" and what is its application to a service-dealer's operation? To answer that question, service management is the process of guiding and controlling a business to provide a proper return on investment. In practice, it means that efforts are being made to maintain *all* operating areas of the business in proper relationship one to the other. In other words, a balanced operation and a good profit position.

Service management is a control technique and, as such, the principal operating areas of the business must be determined. For that purpose, I have selected what I call "The Seven Pillars of Management": (1) personnel; (2) facilities; (3) advertising and promotion; (4) sales revenue; (5) payrolls; (6) records; and (7) credit control. Make these seven operating centers your pillars of strength by controlling them in proper relationship. Don't let them control you. Keep your business in balance.

Employing Competent Personnel

Since space is limited, let me at this time review the problem of employing competent personnel, service technicians in particular. It is probably one of the most difficult for a service-dealer, since the tremendous expansion in the electronics industry has created an almost insatiable demand for engineers and technicians at the manufacturing level. The problem is to compete with this demand. Here are some factors you will want to consider in that respect:

- The starting wage. Is it in line with prevailing rates in the area?

- The salary range. Have minimum/maximum rates been established? Is there assurance of wage adjustments for merit, length of service, etc.?

- Advancement. What are the opportunities in that respect for the men you are trying to get into your organization?

- Steady employment. Has the problem of seasonal employment been met?

- Fringe benefits. Can firm policies regarding vacations, group insurance, hospitalization, etc., be offered to prospective employees?

- Working conditions (e.g. hours, overtime, rules and regulations). Are these conditions in line with local business practices?

A large firm will have clear-cut answers for these questions. The small firm must also have good personnel policies and practices if it is to attract adequate numbers of qualified technical and clerical help.

What about the relationship of personnel to the other operating areas of a servicing business? Surely, this needs no amplification, for incompetent, careless, indifferent personnel can offset your strengths in the other six areas of the business.

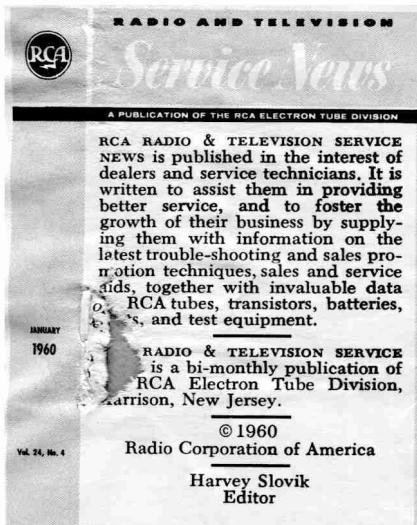
Consumer Giveaways Highlight Latest Silverama

A vibrant new RCA Silverama advertising and sales promotion program has just been announced. Its main purpose: to attract TV-set owners into your shop. There you can discuss with them their advantages in seeing the "Great Wide World of Television" at

its very best . . . on an RCA Silverama, the only one of the three largest-selling brands of replacement picture tubes that is guaranteed all-new—new glass, new gun, new everything.

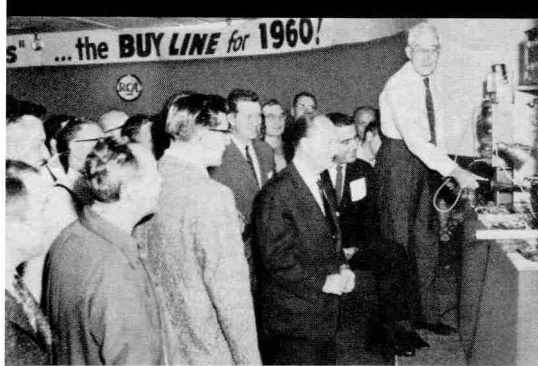
Outstanding item in the new RCA Silverama promotion program is the "Wonderful World" game (Form

7F922), now obtainable through your local RCA Silverama distributor. Offer it to boost your in-store traffic. Certain to go over big with your customers' youngsters, this appealing game comes complete with handsome world map, dial spinner, easy-to-follow rules, and 16 beautiful plastic figurines, each



RCA's new "Wonderful World" game (Form 7F922) is sure to delight the youngsters in your neighborhood. Use it as a free giveaway to draw consumers into your store—where you can further merchandise RCA Silverama picture tubes.





Three of the more recent guest appearances by John R. Meagher were in Cleveland and Columbus, Ohio, and in Miami, Fla., where some 175, 185, and 250 service technicians, respectively, saw and heard this RCA lecturer's latest demonstration and discussion of "Practical Methods for Troubleshooting Horizontal-Output Circuits." The Cleveland meeting (illustrated

at left) was sponsored by Mainline-Cleveland, Inc.; the gathering in Columbus (center) was brought about by Hughes-Peters, Inc., Thompson Radio Supplies, Inc., the Whitehead Radio Co., and Ohio Appliances, Inc.; and the Miami get-together was arranged by East Coast Radio and Television Co., Inc.—all RCA distributors.

Thousands Hear, Cheer Latest Meagher Demonstrations on Troubleshooting

There have been widespread trade association quests for further first-hand guidance of radio and television service technicians. Responding to the call, numerous RCA distributors have sponsored special technical meetings during the past few months that placed the spotlight on "Practical Methods for Troubleshooting Horizontal-Output Circuits"—prepared and presented by John R. Meagher of RCA.

Famed Electron Tube Division lecturer, author, editor, and field engineer, Mr. Meagher has received industry prominence for helping service techni-

cians to become more proficient in their work. Not only is he lauded for his past and present lecture tours, but also for his compilation of the invaluable RCA black-and-white and color television Pict-O-Guides, development of the TV Dynamic Demonstrator, design of the RCA TV-Toter Table, and preparation of the special new editorial series (see pages 6 and 7) on "Troubleshooting with an Oscilloscope."

To date, Mr. Meagher's latest demonstrations of horizontal-output-circuit troubles have been witnessed by thousands of service technicians in 14 states:

Colorado, Florida, Iowa, Illinois, Louisiana, Mississippi, Missouri, Nebraska, New York, Ohio, Pennsylvania, South Dakota, Tennessee, and Texas. More such get-togethers are on the agenda.

At these assemblies, Mr. Meagher employs his Dynamic Demonstrator to show how each type of horizontal-output-circuit trouble produces characteristic effects on the circuit waveforms. Devoid of sales talk, his lecture also includes an explanation of the "six check-point" system for using a CRO and VTVM to pin-point the cause of trouble.

Promotion Program

symbolizing a different nationality and all dressed in native costume . . . Java, India, Mexico, 13 others!

"The Great Wide World of Television" consumer booklet (Form 7F914) is another outstanding new sales-builder featured in the current Silverama promotion campaign. Perfect for handing out over the counter and for mailing to every one of your customers and prospects, this attractive booklet spotlights the variety of TV program fare and accentuates the idea: "See it all at its best . . . see it on a Silverama!" It gives TV-set owners solid reasons for selecting the all-new Silverama.

In addition to the new game and

consumer booklet, your RCA Silverama distributor can also provide you with four hard-working dealer postcards (Forms 7F915A-B-C-D). The first three dramatize the world of enjoyment of Silverama's high quality. The fourth plays up the "Wonderful World" game, prompting many parents on your mailing list to call at your store for this attractive premium.

Your RCA distributor also has available two new Silverama ad mats for your placement in your local newspaper. Form 7F920A flags the attention of TV-set owners to view "The Great Wide World of Television" at its best . . . on an all-new RCA Silverama. Form 7F920B alerts consumers to the exciting "Wonderful World" game which they can pick up at your store.

Lists RCA Replacements For 450 Foreign Tube Types

To assist you in selecting the proper RCA tube type as a replacement for a foreign tube type, RCA has issued the new Foreign-vs-U.S.A. Receiving-Tube Interchangeability Directory (Form ICE-197). Now available at your RCA distributor's, this vital bulletin covers approximately 450 foreign tubes types, used principally in entertainment equipment such as AM and FM radios, television receivers, and audio amplifiers. It lists both direct replacement types and similar types.

RCA Publishes Handy New Picture Tube Interchangeability Wall Chart

See your RCA distributor about your copy of RCA's latest Picture Tube Replacement and Interchangeability Chart (Form 7F912). It has been especially prepared to show you at a glance that with only 88 RCA picture tube types you can replace 253 different in-

dustry types currently in use.

Easy to read, this handy new 15- by 30-inch wall chart is ready to guide your selections of the proper RCA replacement picture tubes for your TV servicing jobs. First and foremost, it presents the comprehensive listing of

253 industry types, together with the corresponding RCA direct replacement types or RCA similar types available. Take note, too, that this guide also keys the differences between each specific industry type and the RCA type which replaces it.

Punching Information Service Technicians Can Use to Prepare Special Cards for RCA's Portable WT-110A Automatic Electron-Tube Tester

Tube Type	Hole Locations	Notes
2EA5	A3 B4 C2 D1 E6 G5 I7 I10 J1 K2 L1 L6 L7 M3 M6 N2 N6	—
2ER5	A3 B4 B6 C1 C7 D2 G5 I6 I10 J2 K8 L1 L6 L8 M3 M6 N2 N6	—
2EV5	A3 B4 C2 C7 D1 E6 G5 I8 I9 J1 K2 L1 L6 L7 M3 M6 N2 N6	—
2FV6	A3 B4 C2 C7 D1 E6 G5 I7 I10 J1 K2 L1 L6 L7 M3 M6 N2 N6	—
3EA5	A3 B4 C2 D1 E6 G5 I7 I10 J1 K2 L1 L6 L7 M4 M6 N2 N6	—
3ER5	A3 B4 B6 C1 C7 D2 G5 I6 I10 J2 K8 L1 L6 L8 M4 M6 N2 N6	—
3EV5	A3 B4 C2 C7 D1 E6 G5 I8 I9 J1 K2 L1 L6 L7 M4 M6 N2 N6	—
4BN4	A3 B4 C1 C6 D2 G5 I7 I8 J1 K4 L1 L6 L7 M4 M6 N1 N6	—
4DK6	A3 B4 C2 C7 D1 E6 G5 I7 I10 J1 K7 L1 L6 L8 M4 M6 N1 N6	—
5AR4	A2 B8 F4 G6 K6 L4 L6 L10 M5 M10 N2 N9	Test P1 and P2; reject if below 4
5BW8 Pentode Section	A4 B5 C7 D6 E8 G9 I7 I10 J1 K6 L1 L6 L7 M5 M6 N1 N6	—
5BW8 Diode Section	A4 B5 C2 F1 G3 I6 I10 K7 L3 L6 L8 M5 M6 N1 N6	Test P1 and P2; reject if below 4
5CM6	A4 B5 C7 D3 E1 G9 I6 I10 J8 K8 L1 L6 L7 M5 M6 N1 N6	—
5CM6 Pentode Section	A4 B5 C3 D2 E7 G6 I7 I10 J1 K3 L1 L6 L7 M5 M6 N1 N6	—
5CR8 Triode Section	A4 B5 C8 D9 G1 I6 I10 J4 K10 L1 L6 L8 M5 M6 N1 N6	—
5EU8 Triode Section	A4 B5 C6 D2 G3 I8 I10 J1 K3 L1 L6 L7 M5 M6 N1 N6	—
5EU8 Pentode Section	A4 B5 C8 D7 E9 G1 I7 I9 J1 K5 L1 L6 L7 M5 M6 N1 N6	—
5GH8 Triode Unit	A4 B5 C8 D9 G1 I8 I10 J1 K3 L1 L6 L7 M5 M6 N1 N6	—
5GH8 Pentode Unit	A4 B5 C7 D2 E3 G6 I8 I10 J1 K5 L1 L6 L7 M5 M6 N1 N6	—
6EA5	A3 B4 C2 D1 E6 G5 I7 I10 J1 K2 L1 L6 L7 M5 M10 N2 N9	—
6EA7 Triode 1	A7 B8 C6 D4 G5 J2 K10 L1 L6 L7 M5 M10 N2 N9	See instructions for gas test
6EA7 Triode 2	A7 B8 C3 D1 G2 J8 K6 L1 L6 L7 M5 M10 N2 N9	—
6EV5	A3 B4 C2 C7 D1 E6 G5 I8 I9 J1 K2 L1 L6 L7 M5 M10 N2 N9	—
6EY6	A2 B7 C8 D5 E4 G3 I6 I10 J7 K9 L1 L6 L8 M5 M10 N2 N9	—
6FM8 Diode Unit	A4 B5 C1 C3 F2 G6 I6 I10 K7 L3 L6 L8 M5 M10 N2 N9	Test P1 and P2; reject if below 4
6FM8 Triode Unit	A4 B5 C7 D8 G9 J3 K9 L1 M5 M10 N2 N9	See instructions for gas test

Tube Type	Hole Locations	Notes
6FW8	A4 B5 C3 C8 D2 D7 F1 G6 I6 I7 J1 K10 L1 L6 L9 M5 M10 N2 N9	Test P1 and P2
6FY8 Triode Section	A4 B5 C8 D1 G9 J2 K5 L1 M5 M10 N2 N9	See instructions for gas test
6FY8 Pentode Section	A4 B5 C2 D3 E7 G6 I8 I10 J1 K2 L1 L6 L7 M5 M10 N2 N9	—
6GH8 Triode Unit	A4 B5 C8 D9 G1 I8 I10 J1 K3 L1 L6 L7 M5 M10 N2 N9	—
6GH8 Pentode Unit	A4 B5 C7 D2 E3 G6 I8 I10 J1 K5 L1 L6 L7 M5 M10 N2 N9	—
6M3	A2 B8 C10 G3 I6 I10 K1 L4 L6 L10 M3 M10 N1 N9	Reject if below 4
7DJ8	A4 B5 C3 C8 D2 D7 F1 G6 I9 I10 J1 K1 L1 L6 L7 M4 M10 N2 N9	Test P1 and P2
9BR8 Pentode Unit	A4 B5 C8 D9 E7 G6 I7 I10 J1 K9 L1 L6 L8 M5 M10 N4 N9	—
9BR8 Triode Unit	A4 B5 C3 D1 G2 I6 I9 J1 K2 L1 L6 L7 M5 M10 N4 N9	—
9DZ8 Triode Section	A4 B5 C8 D1 G9 I6 I9 J3 K8 L1 M4 M10 N3 N9	—
9DZ8 Pentode Section	A4 B5 C2 D3 E7 G6 I8 I9 J2 K4 L1 L6 L7 M4 M10 N3 N9	—
12DM7	Use 12AX7 card	—
12DT7	Use 12AX7 card	—
12DV7 Diode Unit	A4 B5 C1 F3 G2 K6 L4 M2 M10 N4 N9	Test P1 and P2; reject if below 3
12DV7 Triode Unit	A4 B5 C8 D6 G6 J1 K9 K10 L2 M2 M10 N4 N9	See instructions for gas test
12DW5	A4 B5 C7 D3 D6 E1 G9 I6 I10 J8 K1 L6 L7 M2 M10 N4 N9	—
12DZ8 Triode Section	A4 B5 C8 D1 G9 I6 I9 J3 K8 L1 M2 M10 N3 N9	—
12DZ8 Pentode Section	A4 B5 C2 D3 E7 G6 I8 I9 J2 K4 L1 L6 L7 M2 M10 N3 N9	—
12EA6	A3 B4 C2 C7 D1 E6 G5 I6 I10 J2 K7 L2 L6 L7 M2 M10 N4 N9	See instructions for gas test
12FK6 Diode Unit	A3 B4 C2 F5 G6 I6 I10 K7 L4 L6 L7 M2 M10 N3 N9	Test P1 and P2; reject if below 4
12FK6 Triode Unit	A3 B4 C2 D1 G7 I6 I10 J1 K7 L2 M2 M10 N3 N9	—
12FM6 Diode Section	A3 B4 C2 F5 G6 K8 L4 L6 L7 M2 M10 N3 N9	Test P1 and P2; reject if below 4
12FM6 Triode Section	A3 B4 C2 D1 G7 J2 K8 K9 L2 M2 M10 N3 N9	See instructions for gas test
13DR7 Triode #1	A4 B5 C8 D7 G6 J1 K6 L1 M2 M10 N4 N9	See instructions for gas test
13DR7 Triode #2	A4 B5 C9 D2 G1 J7 K6 L1 L6 L7 M2 M10 N4 N9	—
17D4	A7 B8 C3 G5 I6 I10 K5 L4 L6 L10 M4 M9 N2 N8	Reject if below 4
19AQ5	A3 B4 C2 D1 E6 G5 I6 I10 J8 K8 L1 L6 L7 M4 M9 N3 N8	—

Owners of RCA's portable WT-110A Automatic Electron-Tube Tester should take note of the revised card data below and correct their card files accordingly.

Tube Type	Hole Locations	Notes
1AB6 (DK96)	A1 B4 B7 D6 E3 E5 G2 J6 K5 L1 M5 M6 N3 N6	—
1AC6 (DK92)	A1 B4 B7 D6 E3 E5 G2 J7 K6 L1 M5 M6 N3 N6	—
1AH5 (DAF96) (Card 1)	A7 B1 D6 E4 G5 J1 K9 L1 M5 M6 N3 N6	Pentode section
1AH5 (DAF96) (Card 2)	A7 B1 G3 K10 L3 M5 M6 N3 N6	Diode section; reject if below 3
1AJ4 (DF96)	A7 B1 D6 E3 G2 J4 K4 L1 M5 M6 N3 N6	—
3CS6 (Discard Former Test Card)	A3 B4 B7 C2 D1 E6 G5 I6 I7 J1 K8 L1 M4 M6 N2 N6 (Card 1 of 2 cards)	Grid 1 test OK over 4
3CS6 (Discard Former Test Card)	A3 B1 B4 C2 D7 E6 G5 I6 I7 J1 K10 L1 M4 M6 N2 N6 (Card 2 of 2 cards)	Grid 3 test OK over 4
3S4 (Discard Former Data and Cards)	A1 B7 D3 E4 G2 J10 K4 L1 M2 M6 N4 N6	—
4CS6 (Discard Former Test Card)	A3 B4 B7 C2 D1 E6 G5 I6 I7 J1 K8 L1 M4 M6 N1 N6 (Card 1 of 2 cards)	Grid 1 test OK over 4
4CS6 (Discard Former Test Card)	A3 B1 B4 C2 D7 E6 G5 I6 I7 J1 K10 L1 M4 M6 N1 N6 (Card 2 of 2 cards)	Grid 3 test OK over 4
6AS6	Mark former card "Card 1 of 2 cards"	Grid 1 test
6AS6	A3 B1 B4 C2 D7 E6 G5 I6 I8 J6 K10 L1 M5 M10 N2 N9 (Card 2 of 2 cards)	Grid 3 test
6BN5 (EL85)	A4 B5 C3 C6 D1 E9 G7 J1 K2 L1 M5 M10 N2 N9	—
6CG7 (Discard Former Data and Cards)	A4 B5 C3 C8 D2 D7 F1 G6 I6 I10 J3 K1 L1 M5 M10 N2 N9	Test P1 and P2
6CQ8 Triode Section	A4 B5 C8 D9 G1 I7 I10 J1 K2 L1 L6 L7 M5 M10 N2 N9	—
6CS6 (Discard Former Test Card)	A3 B4 B7 C2 D1 E6 G5 I6 I7 J1 K8 L1 M5 M10 N2 N9 (Card 1 of 2 cards)	Grid 1 test OK over 4
6CS6 (Discard Former Test Card)	A3 B1 B4 C2 D7 E6 G5 I6 I7 J1 K10 L1 M5 M10 N2 N9 (Card 2 of 2 cards)	Grid 3 test OK over 4
6CU8 (Card 2)	(Should be corrected to include missing hole at C1)	—
6DE4	A7 B8 C3 G5 I6 I10 K7 L4 L6 L10 M4 M10 N2 N9	Reject if below 4
6DJ8 (ECC88)	A4 B5 C3 C8 D2 D7 F1 G6 I9 I10 J1 K1 L1 L6 L7 M5 M10 N2 N9	Test P1 and P2

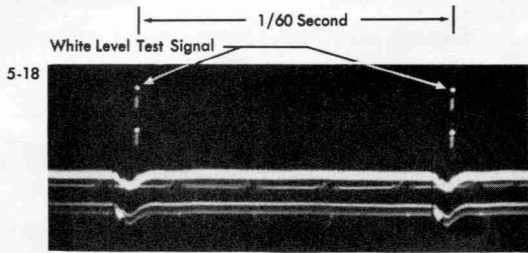
CHART No. 2

SYNC Compression

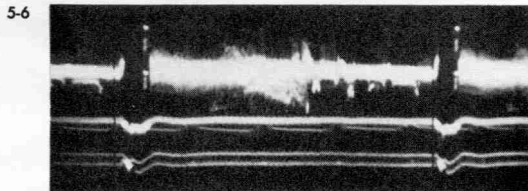
by John R. Meagher, RCA Electron Tube Division, Harrison, N. J.

TROUBLESHOOTING

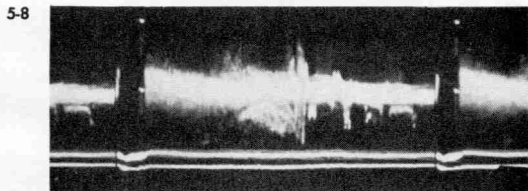
The CRO photographs in this chart show composite TV signal waveforms at the output of the second detector or in the video amplifier. CRO sweep rate = 20 cycles.



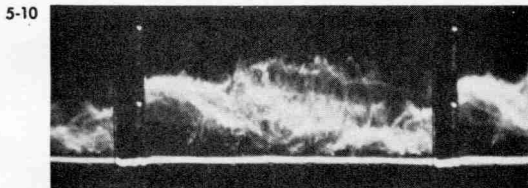
2A. TV signal waveform photographed at a moment when no picture signals were being transmitted.



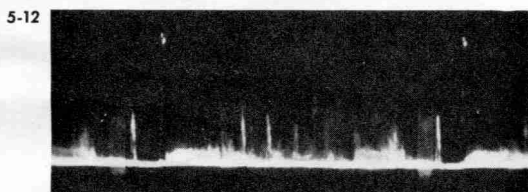
2B. The amplitude of the sync signals should be approximately 25% of the total TV signal amplitude, as shown here.



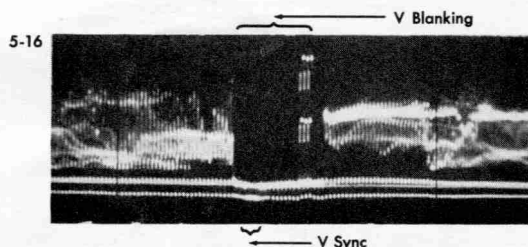
2C. Partial compression of sync signals, caused by over-loading in the IF amplifier due to low AGC voltages. The sync amplitude in this example is less than 10% of the total signal amplitude.



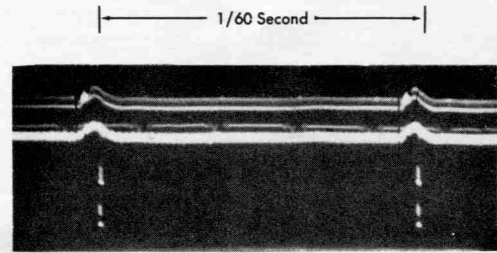
2D. Almost complete compression of sync due to insufficient AGC voltages on RF-IF amplifiers.



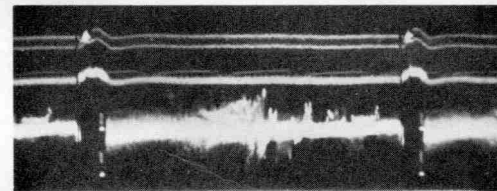
2E. Additional compression, due to over-loading in the RF, IF, or video amplifiers, compresses the dark picture signals as well as the sync signals.



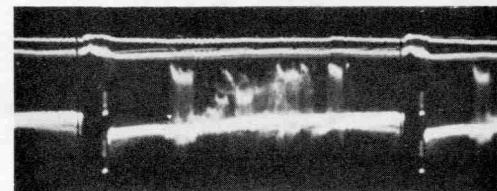
2F. Similar to 2C, but with the horizontal gain control advanced in order to expand the vertical sync and blanking signals.



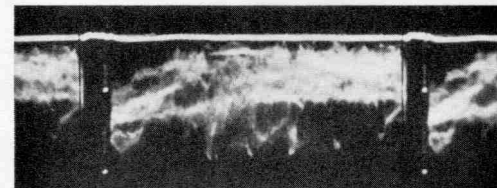
2G. Similar to 2A, but opposite polarity.



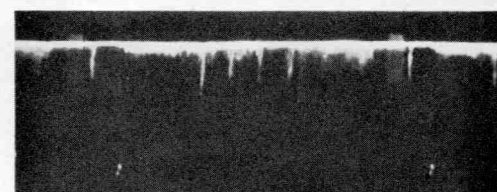
2H. Similar to 2B, but opposite polarity.



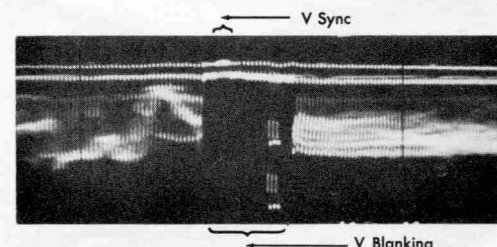
2I. Similar to 2C, but opposite polarity.



2J. Similar to 2D, but opposite polarity. Compression may occur also in the video amplifier, usually due to incorrect bias voltage.

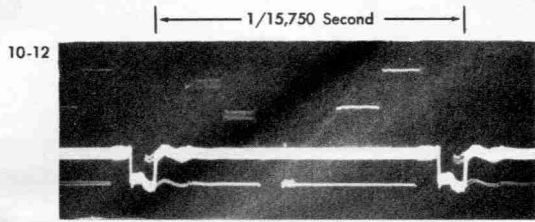


2K. Similar to 2E, but opposite polarity.

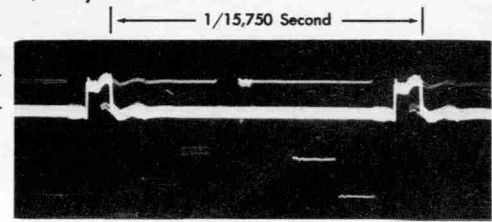


2L. Similar to 2F, but opposite polarity.

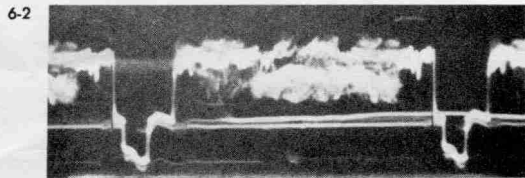
The CRO waveforms in this chart show composite TV signal waveforms at the output of the second detector or in the video amplifier. CRO sweep rate = 5,250 cycles.



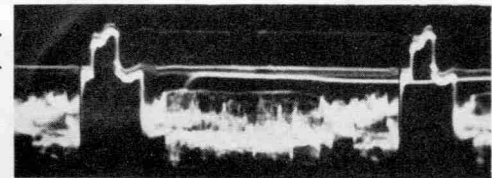
3A. TV signal waveform photographed at a moment when no picture signals were being transmitted.



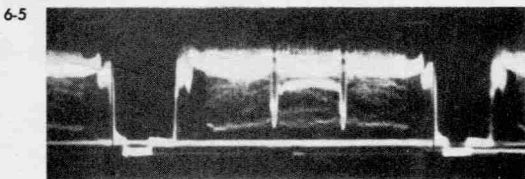
3G. Similar to 3A, but opposite polarity.



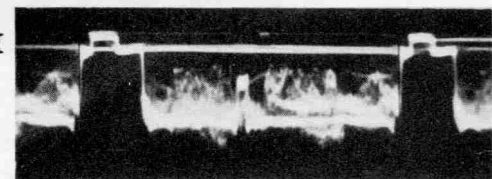
3B. The amplitude of the sync signals should be approximately 25% of the total TV signal amplitude, as shown here.



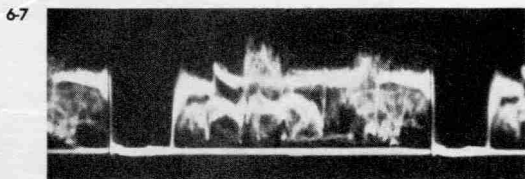
3H. Similar to 3B, but opposite polarity.



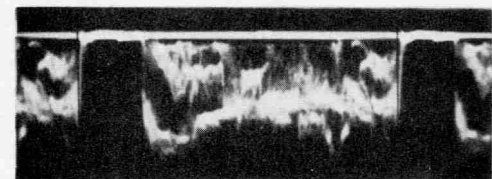
3C. Partial compression of sync signals, caused by over-loading in the IF amplifier due to low AGC voltages. The sync amplitude in this example is only about 5% of the total signal amplitude.



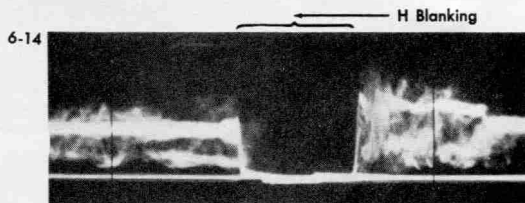
3I. Similar to 3C, but opposite polarity.



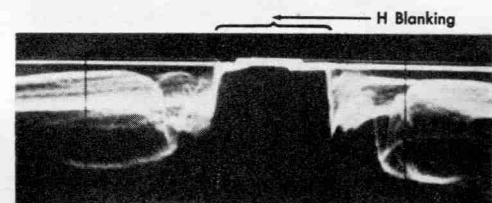
3D. Almost complete compression of sync due to insufficient AGC voltages on RF-IF amplifiers.



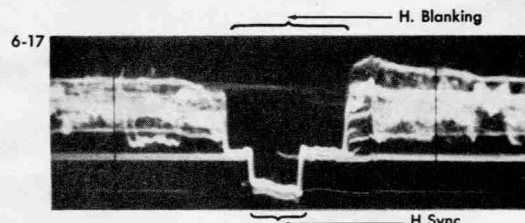
3J. Similar to 3D, but opposite polarity. Compression may occur also in the video amplifier, usually due to incorrect bias voltage.



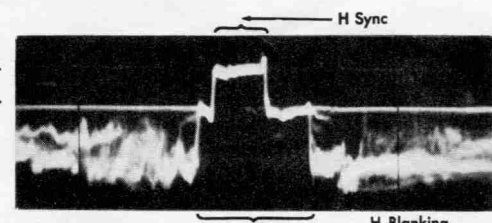
3E. Similar to 3D, but with the horizontal gain control advanced in order to expand the horizontal sync and blanking signals.



3K. Similar to 3E, but opposite polarity.



3F. The waveform of the horizontal sync and blanking pulses usually appears slightly different on different stations. This photograph shows normal sync waveform from a second station. Compare with 3B and 3L.



3L. Waveform of normal horizontal sync and blanking pulses from a third station. This photograph shows some over-shoot due to high-frequency peaking in the transmitter. Compare with 3F and 3B.

REDUCE DAMPER TUBE CALLBACKS



Here are some important facts about damper circuits

In the transformer-coupled circuit, Figure 1, the damper cathode is connected to the "low" (Boost) side of the sweep-output circuit. The voltage difference between cathode and ground is usually less than about 600 volts.

In the direct-drive circuit, Figure 2, and in the auto-transformer circuit, Figures 3 and 4, the damper cathode is connected to a "high" point in the sweep-output circuit. The peak voltage difference between cathode and ground may be several thousand volts.

Because the damper cathode is "above ground" by several hundred to several thousand volts, care must be taken to prevent voltage breakdown between heater and cathode in the

damper tube. Two basic methods are used:

In one method, shown in Figures 1, 2, and 3, heater is connected to cathode. This connection eliminates voltage difference between heater and cathode, but it also makes the damper tube heater circuit "hot" with respect to ground. For this reason it is necessary to use a separate secondary winding on the power transformer just for the damper heater. This winding, and its connecting leads, must be insulated to withstand the peak voltage difference between cathode and ground.

In the circuits of Figures 1, 2, and 3, if the damper heater winding becomes grounded, or arcs to ground, high current will flow from B+ to ground through the damper tube, and the fuse will blow. Correction of this trouble usually requires costly and time-consuming replacement of the power transformer.

The second method, shown in Figure 4, takes advantage of the fact that modern damper tubes, such as the RCA-6AX4-GTA, 6AU4-GTA, and 6DE4, are designed to withstand high-amplitude positive pulse voltages between heater and cathode. These RCA

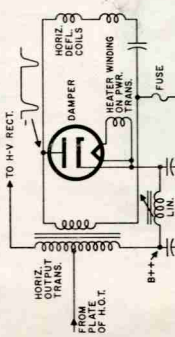


Figure 1. Transformer-coupled horizontal-output circuit. Note that the damper tube heater is connected to the cathode.

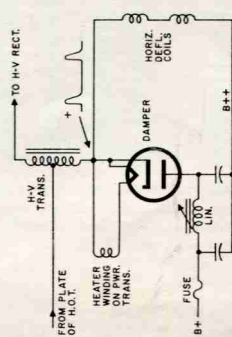


Figure 2. Direct-drive circuit. In some variations of this circuit, a capacitor is connected between heater and cathode in place of the direct connection. The capacitor serves to reduce the pulse-voltage difference between heater and cathode.

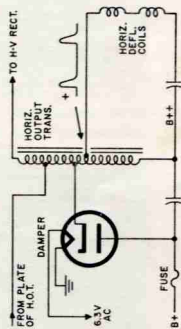


Figure 4. Modern auto-transformer circuit in which the damper tube heater is grounded. Tubes such as the RCA-6AX4-GTA, 6AU4-GTA, and 6DE4, which are designed to withstand high peak pulse voltage between heater and cathode, are required in this circuit.

Momentary arcing, or flashover, in a horizontal output tube or damper tube may be "self-correcting", that is, the flashover may not occur again. But the momentary flashover results in a heavy surge of current which will blow the conventional type of fuse. You can eliminate such unnecessary fuse failure by using RCA "chemical" fuses in the horizontal-output circuit. Three varieties, RCA Stock Nos. 104295, 105041, 105042, are available at your RCA distributor.

RCA damper tubes are designed to give long, dependable service—eliminate costly callbacks—prevent loss of your time and profits. Take for example the RCA-6DE4 and RCA-17DE4. These tubes can supply a peak plate current of 1100 milliamperes and withstand a heater-to-cathode potential of 5000 volts—with a 900-volt dc component! Assure your customers of this kind of performance by asking your distributor for RCA damper tubes.



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