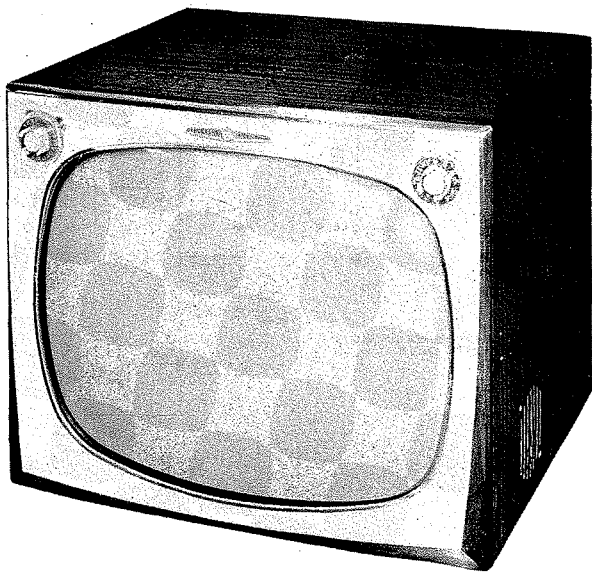




DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel of cabinet.
2. Remove 8 metal screws. Remove rear cover.
3. Remove 2 metal screws located behind channel selector and picture knobs.
4. Place receiver face down on a soft surface.
5. Remove 2 metal screws from interlock and antenna bracket.
6. Disconnect speaker leads, HV lead, picture tube socket and yoke plugs.
7. Remove 4 chassis bolts. Remove chassis.
8. Remove 2 speaker nuts. Remove speaker.



| MODELS | CHASSIS |
|--|---------|
| 2D1520A, 2D1521A, 2D2526A, 2D2527A ... 21T33 | |
| 2D1522A, 2D2528A | 21T31 |

TRUETIME MODELS 2D1520A, 2D1521A, 2D1522A, 2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet below the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set.

Adjustment is located on the tube side of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate the sound IF detector buzz, adjust the buzz control located on the tube side of the chassis for maximum and MINIMUM buzz.

HORIZONTAL SIZE CONTROL

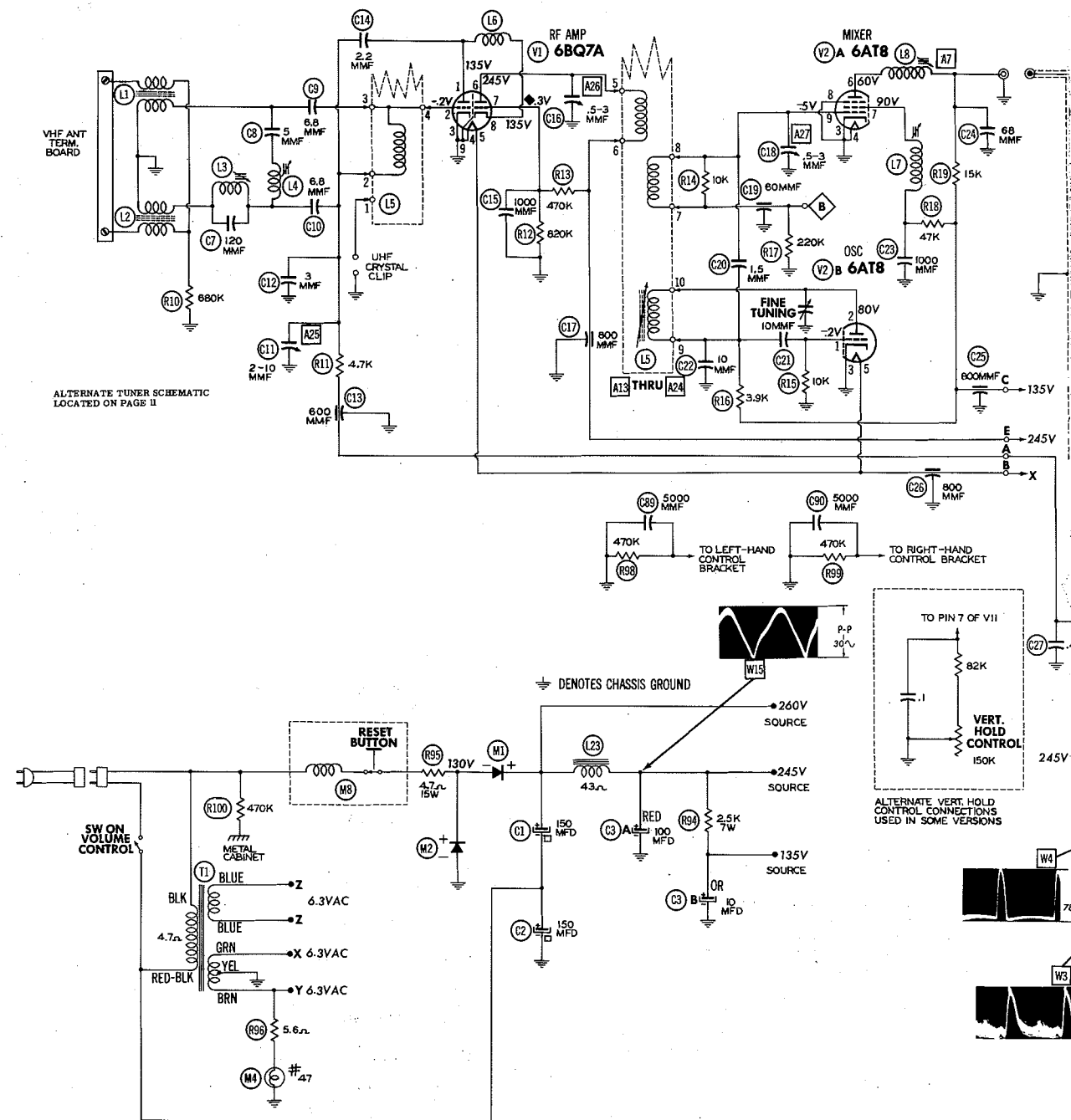
The horizontal size control is a brass sleeve located on the neck of the picture tube and slides between the yoke and the picture tube. Push sleeve into yoke to decrease size, pull out to increase size.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1956 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



◆ MEASURED FROM PIN 8 OF V1.

Ⓢ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

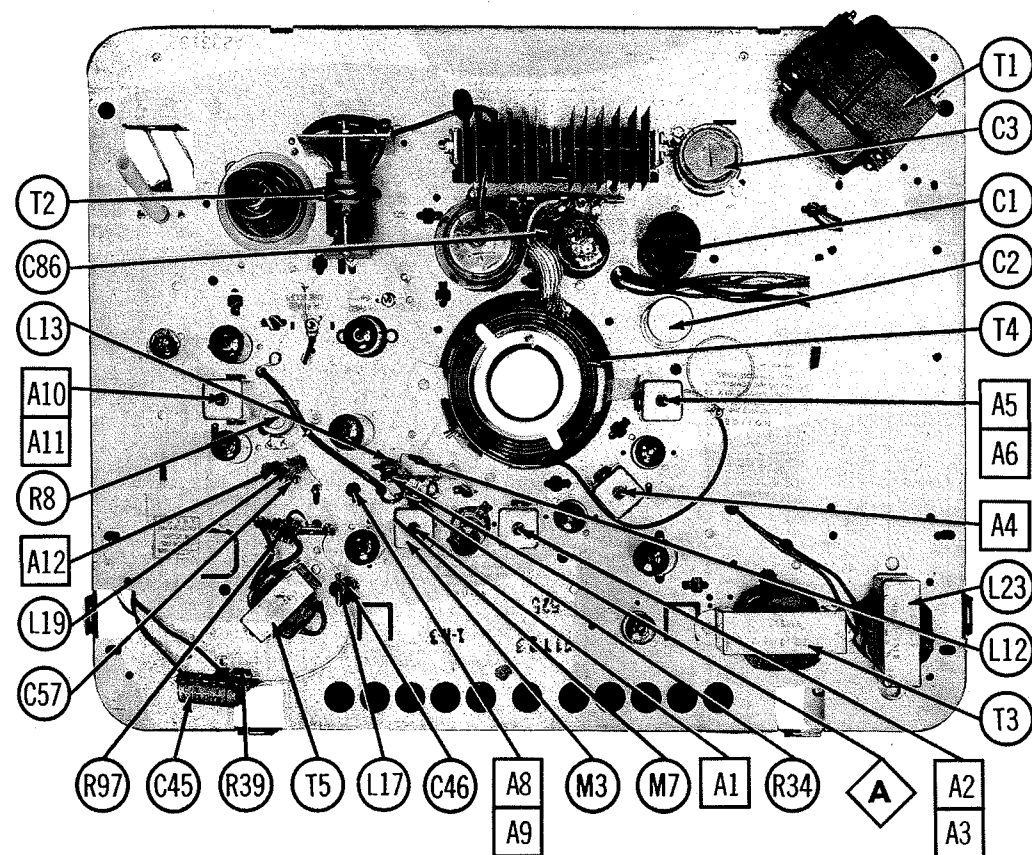
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

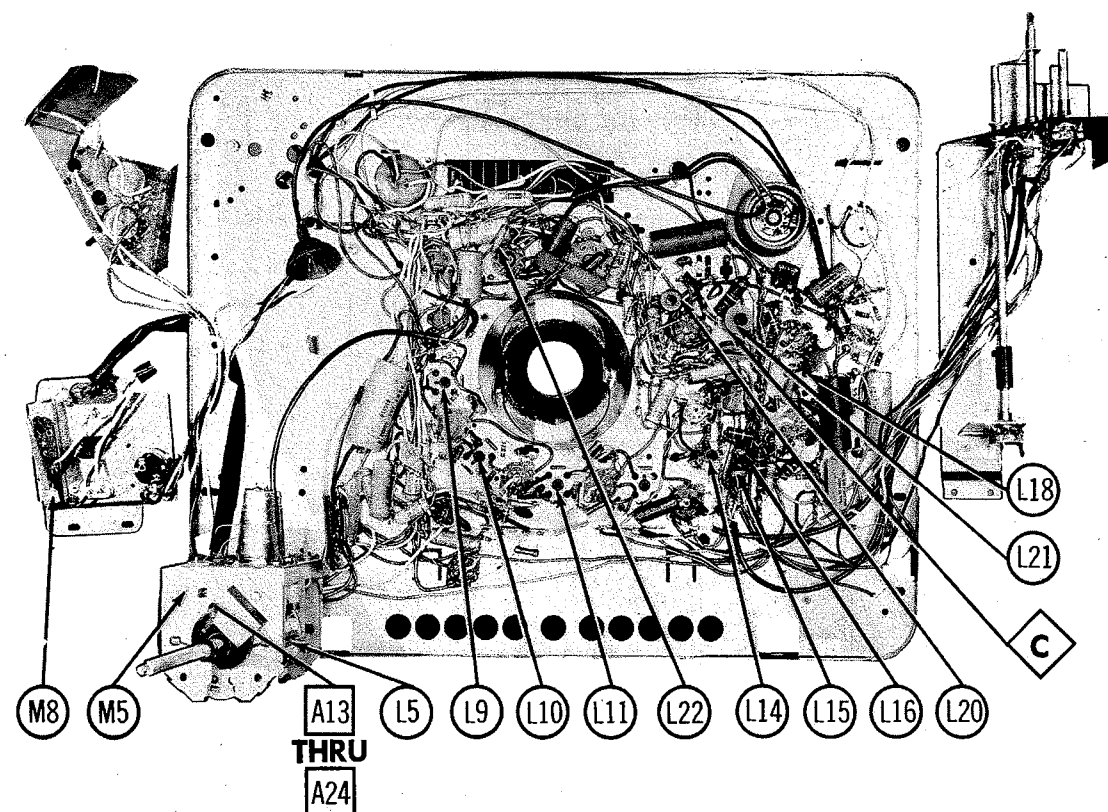
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

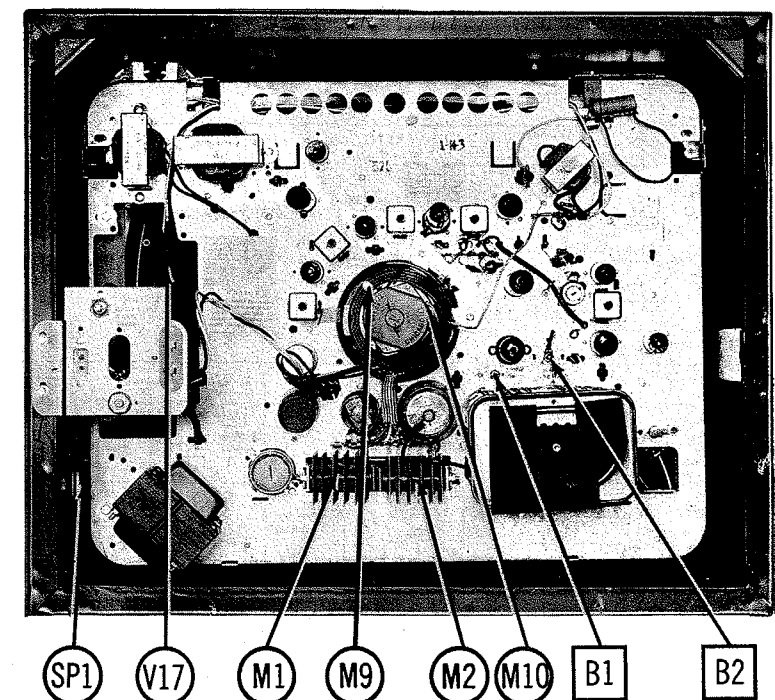
A PHOTOFAC STANDARD NOTATION SCHEMATIC
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CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-INDUCTOR AND ALIGNMENT IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control (R4) to its mid-range position.

Connect a short clip lead across L22. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Remove the clip lead from across L22. Connect the vertical amplifier of

the oscilloscope thru a low capacity probe to point \diamond . Low side to chassis.

Adjust the horizontal stabilizer coil slug (B2) until waveform similar to Fig. 8 is obtained. While making this adjustment keep the picture in sync with the horizontal hold control. Remove scope connections. Check range of the horizontal hold control (R4). Turn R4 fully counter clockwise and then fully clockwise. The picture should fall out of sync at each extreme setting of R4.

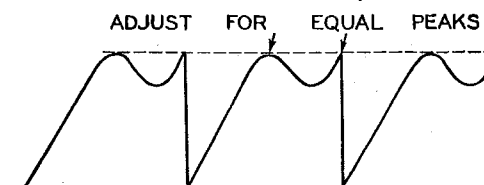
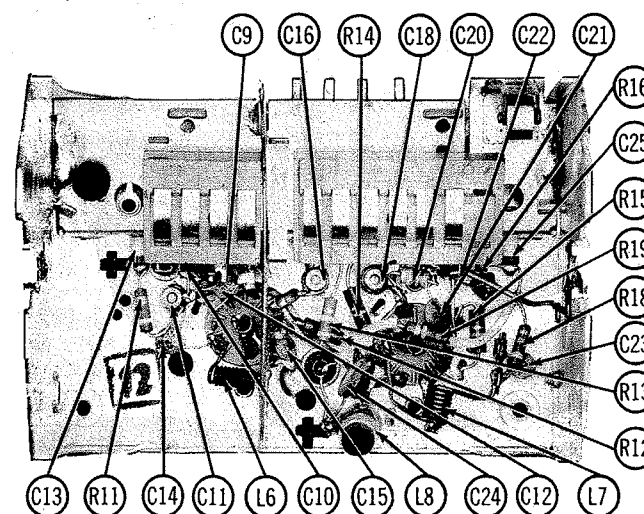
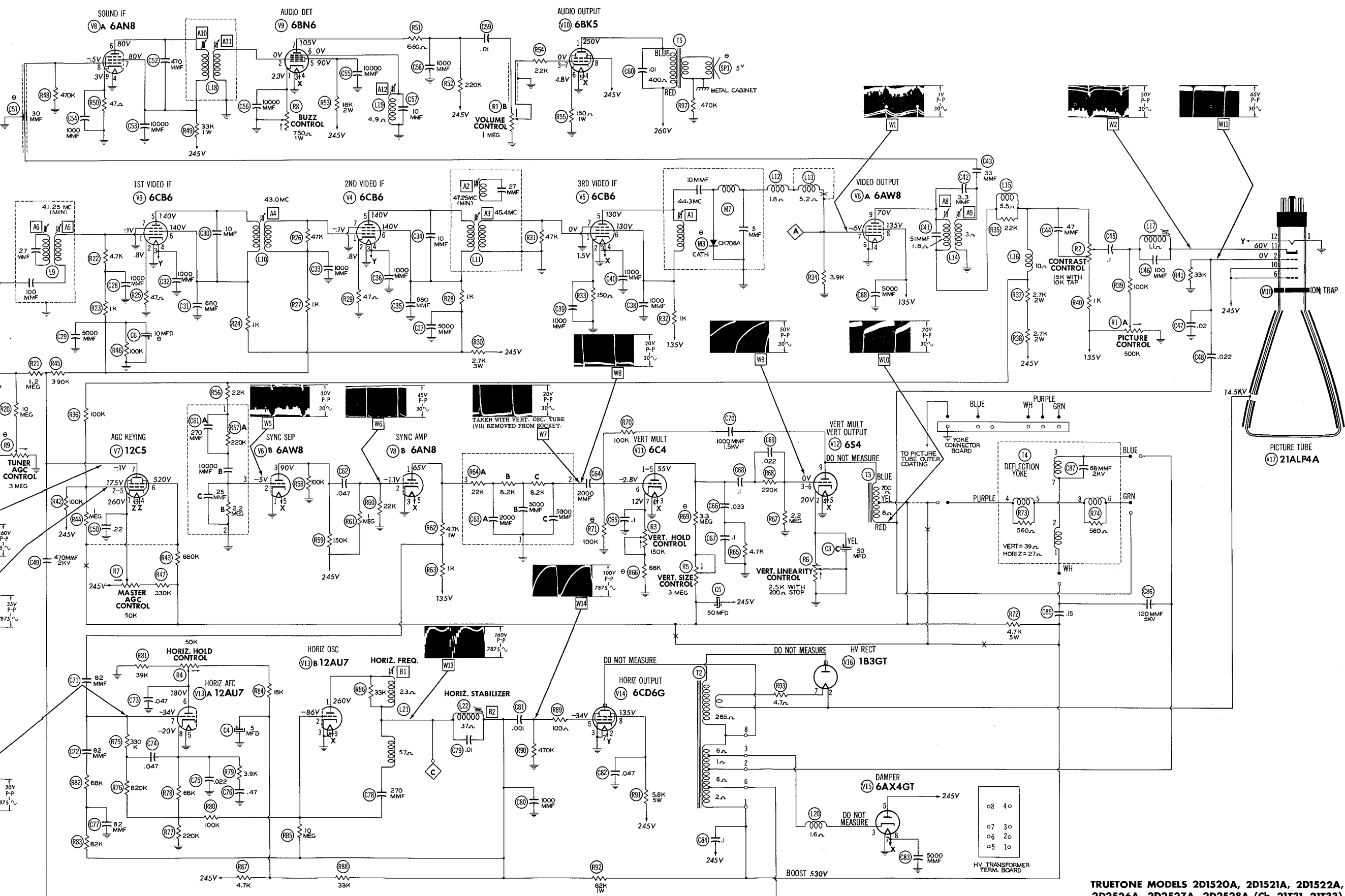


FIG. 8



RF TUNER BOTTOM VIEW



TRUETONE MODELS 2D1520A, 2D1521A, 2D1522A,
2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33)

TRUETONE MODELS 2D1520A, 2D1521A, 2D1522A,
2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | | NOTES |
|----------|----------------------------------|---------|------|-------------------|-------------------|----------------|-----------------|------------------------------|
| | | PRI. | SEC. | TRUETONE PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | |
| J | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-41-D | | | | Channel 11 |
| K | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-42-D | | | | Channel 12 |
| L | Ant., RF, Mixer Grid, Osc. Coils | 0Ω | | 31M-43D | | | | Channel 13 |
| L6 | Neut. Coll | 0Ω | | 31B-727 | | | | |
| L7 | RF Coll | 0Ω | | 25A-164-01 | | | | |
| L8 | Conv. Plate | | | 31UA-605 | | | | |
| L9 | 1st Video IF | | | 13A-24203 | | | | Includes 4L 25MC Trap & Cap. |
| L10 | 2nd Video IF | .1Ω | .1Ω | 13A-24224 | 17-5001 * | TV-125 * | 6231 * | Includes 47.25MC Trap |
| L11 | 3rd Video IF | .1Ω | .1Ω | 13A-24937 | 17-5003 * | TV-128 * | 6233 * | |
| L12 | Series Peak-ing Coll | 1.8Ω | | 16A-22427 | | | | 7.5 Microhenries |
| L13 | Shunt Peak-ing Coll | 5.2Ω | | 16A-24998 | | | | 140 Microhenries-Note 1 |
| L14A | 4.5MC Trap | 1.8Ω | | 201-23729 | | | | |
| L15 | Series Peak-ing Coll | 5.5Ω | | 16A-24020 | 19-3180 | TV-184 | 6180 | 170 Microhenries |
| L16 | Shunt Peak-ing Coll | 10Ω | | 16A-24019 | 19-3500 | | 6138 | 480 Microhenries |
| L17 | 4.5MC Trap | 1.1Ω | | 16A-25441 | 20-1004 | TV-151 | 1469 | |
| L18 | 2nd Sound IF | .3Ω | | 201-23873 | | | | |
| L19 | Quadrature Coll. | 4.8Ω | | 201-23727 | | | 1480 | |
| L20 | RF Choke | 1.6Ω | | 16A-21701 | 19-1005 | | 4612 | 8 Microhenries |

Note 1. Not used in some versions.
* Cut out chassis hole and use adaptor plate.

TRANSFORMER (HORIZ. OSC.)

| ITEM No. | DC RES. | | REPLACEMENT DATA | | | | | | | NOTES |
|----------|---------|------|-------------------|-------------------|----------------|-----------------|--------------|--------------|---------------------|----------------------------|
| | PRI. | SEC. | TRUETONE PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | RCA TYPE No. | Rom PART No. | Thordarson PART No. | |
| L21 | 80Ω | | 12E-24440 | | | 6212 | | | | Horiz. Osc. - tapped @ 57Ω |
| L22 | 37Ω | | 13M-24441 | | | 6314 | | | | |

FILTER CHOKE

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | | | |
|----------|----------------------|------------------|-------------------------------------|-------------------|---------------------|----------------|------------------|---------------------|----------------|
| | TOTAL DIRECT CURRENT | D. C. RESISTANCE | INDUCTANCE (0 CURRENT 1000 μ A) | TRUETONE PART No. | Holldorson PART No. | Merit PART No. | Stancor PART No. | Thordarson PART No. | Triod PART No. |
| L23 | .350A | 43Ω | 1.34HY | 16B-25146 | C5041 ① | | C2328 ① | | |

① Drill one new mounting hole.

SELENIUM RECTIFIER

| ITEM No. | RATING | REPLACEMENT DATA | | | | | | NOTES |
|----------|---------|-------------------|------------------|------------------------|------------------|-------------------------|-------------------------|-------|
| | CURRENT | TRUETONE PART No. | FEDERAL PART No. | INTERNATIONAL PART No. | MALLORY PART No. | RADIO RECEPTOR PART No. | SARKES TARZIAN PART No. | |
| M1 | .380A | 21J-25315 | 1179D | RS400 | 6S450 | 5S2 | 500 | |
| M2 | .380A | 21J-25316 | 1179D | RS400 | 6S450 | 5S2 | 500 | |

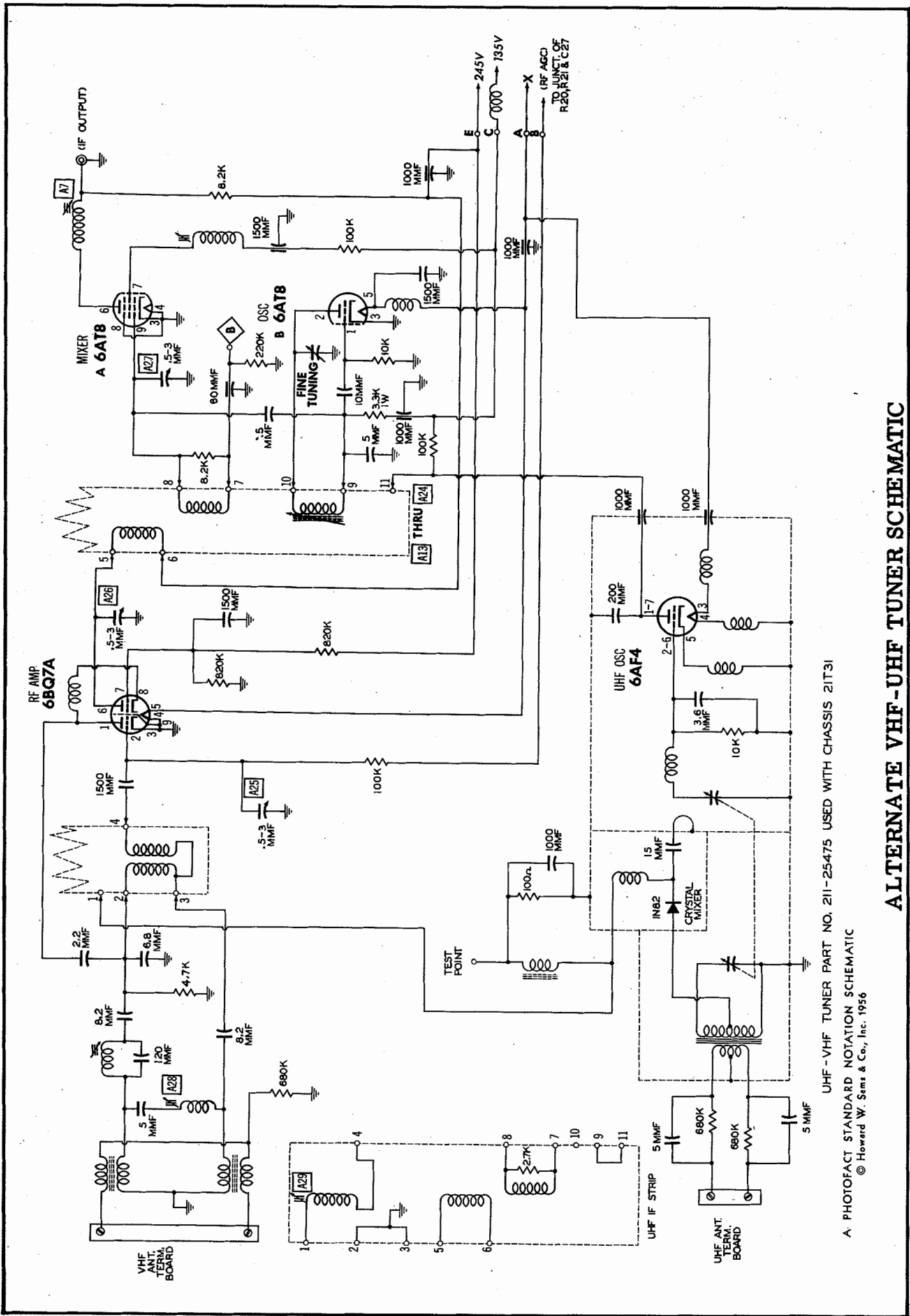
CRYSTAL DIODES

| ITEM No. | ORIG. TYPE | REPLACEMENT DATA | | NOTES |
|----------|------------|-------------------|-------------------|----------------------|
| | | TRUETONE PART No. | SYLVANIA PART No. | |
| M3 | CK-706A* | 8M-21959 | 1N60 | Video Det. (Pigtail) |

* Some versions may use crystal diode type CK-706 in this application.

MISCELLANEOUS

| ITEM No. | PART NAME | TRUETONE PART No. | NOTES |
|----------|------------------|-------------------|--|
| M4 | Dial Light | 46A-10793 | #47 |
| M5 | Tuner | 21I-25453 | VHF-Chassis 21T33 |
| M6 | Tuner | 21I-25475 | VHF-UHF-Chassis 21T31 |
| M7 | Video Det. Assy. | 13B-24206-1 | Includes M3, Coils, & Capacitors |
| M8 | Circuit Breaker | 20F-25568 | |
| M9 | Centering Device | 16M-23770 | Includes Deflection Yoke (T4) Rear Cover |
| M10 | Ion Trap | 16M-19705 | |
| | Cabinet | 200-25490 | Models 2D-1522A, 2D-1520A |
| | Cabinet | 200-25381-1 | Model 2D-2527A |
| | Cabinet | 200-26381 | Models 2D-2528A, 2D-2526A |
| | Cabinet | 200-25490-1 | Model 2D-1521A |
| | Knob | 5B-25494-A56 | Channel Selector-Models 2D-1522A, 2D-2526A |
| | Knob | 5B-25184-A56 | Channel Selector-Models 2D-1520A, 2D-1521A, 2D-2526A, 2D-2527A |
| | Knob | 5B-25495-A29 | Fine Tuning-Models 2D-1522A, 2D-2528A |
| | Knob | 5B-25177-A29 | Fine Tuning-Models 2D-1520A, 2D-1521A, 2D-2528A, 2D-2527A |
| | Knob | 5B-25734-A56 | UHF Indicator-Models 2D-1522A, 2D-2528A |
| | Knob | 5B-25183-A56 | On-off-volume |
| | Knob | 5B-25178-A29 | Picture |
| | Knob | 5B-25176-A29 | Control (3 Used) |
| | Safety Glass | 30M-25492 | |



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TRUETONE MODELS 2D1520A, 2D1521A, 2D1522A,
2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33),
CITIZENS TUNER FHN-FHA ELNERNALTV

TUBES (GENERAL ELECTRIC, SYLVANIA)

| ITEM No. | USE | REPLACEMENT DATA | | NOTES |
|----------|-----------------------------|--------------------|----------------------|-------|
| | | TRUE TONE PART No. | STANDARD REPLACEMENT | |
| V1 | RF Amp. | 6BQ7A | 6BQ7A | |
| V2 | Mixer-Osc. | 6AT8 | 6AT8 | |
| V3 | 1st Video IF Amp. | 6CB6 | 6CB6 | |
| V4 | 2nd Video IF Amp. | 6CB6 | 6CB6 | |
| V5 | 3rd Video IF Amp. | 6CB6 | 6CB6 | |
| V6 | Video Output-Sync Separator | 6AW8 | 6AW8 | |
| V7 | AGC Keying | 12C5 | 12C5 | |
| V8 | Sound IF Amp. - Sync Amp. | 6AN8 | 6AN8 | |
| V9 | Audio Det. - AF Amp. | 6BN6 | 6BN6 | |
| V10 | Audio Output | 6BK5 | 6BK5 | |
| V11 | Vert. Mult. | 6C4 | 6C4 | |
| V12 | Vert. Mult-Vert. Output | 6C4 | 6C4 | |
| V13 | Horiz. AFC-Horiz. Osc. | 12AU7 | 12AU7 | |
| V14 | Horiz. Output | 6CD6G | 6CD6G | |
| V15 | Damper | 6AX4GT | 6AX4GT | |
| V16 | HV Rect. | 1B5GT | 1B5GT | |

CATHODE-RAY TUBE

| ITEM No. | REPLACEMENT DATA | | NOTES |
|----------|--------------------|---------------------------|-------|
| | TRUE TONE PART No. | GENERAL ELECTRIC PART No. | |
| | 21ALP4A ① | 21ALP4A ① | |
| | 21ALP4B ① | 21ALP4A/B ① | |
| | 21ALP4 | 21ALP4 | |

ELECTROLYTIC CAPACITORS

| ITEM No. | RATING CAP. VOLT. | REPLACEMENT DATA | | NOTES |
|----------|-------------------|--------------------|------------------|-------|
| | | TRUE TONE PART No. | AEROVOX PART No. | |
| C1 | 150 | 8C-22464 | AFH51-70 | |
| C2 | 150 | 8C-22463 | AFH51-70 | |
| C3A | 100 | 8C-25308 | AFH53-99-75 | |
| B | 50 | | BR505 | |
| C | 50 | | PR530V4 | |
| C4 | 5 | 8C-24174 | PR530V50 | |
| C5 | 5 | 8C-25532 | PR530V50 | |
| C6 | 10 | (Note 1) | PR530V10 | |

Note 1. Some versions may use a 5MFD @ 50V unit (part #8C-20557) in this application

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

| ITEM No. | RATING CAP. VOLT. | REPLACEMENT DATA | | NOTES |
|----------|-------------------|--------------------|------------------|-------|
| | | TRUE TONE PART No. | AEROVOX PART No. | |
| C7 | 120 | 13L8V12IK | BPD-00012 | |
| C8 | 5 | 13L8C050D | NP0-D15 | |
| C9 | 6.8 | 13L8C6R81 | NP0-D18.8 | |
| C10 | 6.8 | 13L8C6R81 | NP0-D18.8 | |
| C11 | 2-10 | 13B-901 | TCZ-6R8 | |
| C12 | 3 | | TCZ-10 | |
| C13 | 600 | 13M-320EA-102ZC | NP0-D13 | |
| C14 | 2.2 | 13L8GPR2C | NP0-S12.2 | |
| C15 | 1000 | 13L8X102Z | BPD-001 | |
| C16 | 5-3 | 13B-902 | DD-102 | |
| C17 | 800 | 13M-320EA-102ZC | 629-3 | |
| C18 | 5-3 | 13B-902 | 629-3 | |
| C19 | 60 | 13M-320Q-600J | TCZ-2R2 | |
| C20 | 1.5 | | K069 | |
| C21 | 10 | 13L8Q100A | NP0-S11.5 | |
| C22 | 10 | 13L8Q100D | TCZ-1R5 | |
| C23 | 1000 | 13L8X102Z | T204 | |
| C24 | 68 | 13L12U680H | NP0A-1R5 | |
| C25 | 800 | 13M-320EA-102ZC | NP0A-1R5 | |
| C26 | 800 | 13M-320EA-102ZC | NP0A-1R5 | |
| C27 | 47 | 8K-230-87 | DD-102 | |
| C28 | 1000 | 8C-13201 | DD-102 | |
| C29 | 5000 | 8C-13962 | DD-102 | |
| C30 | 10 | 8C-19502 | TCN-10 | |
| C31 | 660 | 8C-21105 | DD-102 | |
| C32 | 1000 | 8C-13201 | DD-102 | |
| C33 | 1000 | 8C-13201 | DD-102 | |
| C34 | 10 | 8C-19502 | TCN-10 | |
| C35 | 680 | 8C-21105 | DD-102 | |
| C36 | 1000 | 8C-13201 | DD-102 | |
| C37 | 5000 | 8C-13962 | DD-102 | |
| C38 | 1000 | 8C-20754 | DD-102 | |
| C39 | 1000 | 8C-20754 | DD-102 | |
| C40 | 1000 | 8C-20754 | DD-102 | |
| C41 | 51 | 8G-23793 | DD-102 | |
| C42 | 3.3 | 8L-23551 | DD-102 | |
| C43 | 33 | 8G-19503 | DD-102 | |
| C44 | 47 | 8G-20740 | DD-102 | |
| C45 | 1 | 8K-23095 | DD-102 | |
| C46 | 100 | 8N1-113 | DD-102 | |
| C47 | 0.22 | 8K-23082 | DD-102 | |
| C48 | 0.22 | 8K-23104 | DD-102 | |
| C49 | 470 | 8K-24989 | DD-102 | |
| C50 | 22 | 8K-23097 | DD-102 | |
| C51 | 30 | 14B-23772 | DD-102 | |
| C52 | 470 | 8N1-121 | DD-102 | |
| C53 | 10000 | 8G-20269 | DD-102 | |
| C54 | 1000 | 8G-13201 | DD-102 | |
| C55 | 10000 | 8G-20269 | DD-102 | |
| C56 | 10000 | 8G-20269 | DD-102 | |
| C57 | 10 | 8G-1789 | DD-102 | |
| C58 | 1000 | 8G-13201 | DD-102 | |
| C59 | 0.1 | 8K-23091 | DD-102 | |
| C60 | 0.1 | 8K-23102 | DD-102 | |
| C61A | 10000 | 117A-24212 | DD-102 | |
| C62 | 0.47 | 6K-23083 | DD-102 | |
| C63A | 2000 | 117A-22376 | DD-102 | |
| C | 5000 | | DD-102 | |
| C | 5000 | | DD-102 | |

PARTS LIST AND DESCRIPTIONS CAPACITORS (cont)

| ITEM No. | RATING CAP. VOLT. | REPLACEMENT DATA | | NOTES |
|----------|-------------------|--------------------|------------------|-------|
| | | TRUE TONE PART No. | AEROVOX PART No. | |
| C64 | 2000 | 8G-19522 | DD-102 | |
| C65 | 1 | 8K-23064 | DD-102 | |
| C66 | 0.033 | 8K-23064 | DD-102 | |
| C67 | 1 | 8K-23064 | DD-102 | |
| C68 | 0.022 | 8K-23082 | DD-102 | |
| C69 | 1000 | 8G-24981 | DD-102 | |
| C70 | 1000 | 8G-24981 | DD-102 | |
| C71 | 82 | 8N1-112 | DD-102 | |
| C72 | 82 | 8N1-112 | DD-102 | |
| C73 | 0.47 | 8K-23094 | DD-102 | |
| C74 | 0.47 | 8K-23094 | DD-102 | |
| C75 | 0.022 | 8K-23082 | DD-102 | |
| C76 | 0.47 | 8K-23082 | DD-102 | |
| C77 | 82 | 8N1-112 | DD-102 | |
| C78 | 270 | 8N1-112 | DD-102 | |
| C79 | 0.1 | 8M-24439 | DD-102 | |
| C80 | 1000 | 8N2-125 | DD-102 | |
| C81 | 0.01 | 8K-23099 | DD-102 | |
| C82 | 0.47 | 8K-23094 | DD-102 | |
| C83 | 5000 | 8G-13962 | DD-102 | |
| C84 | 1 | 8K-23106 | DD-102 | |
| C85 | 15 | 8K-23085 | DD-102 | |
| C86 | 120 | 8K-25325 | DD-102 | |
| C87 | 66 | 2000 | DD-102 | |
| C88 | 5000 | 8G-13962 | DD-102 | |
| C89 | 5000 | 8G-13962 | DD-102 | |
| C90 | 5000 | 8G-13962 | DD-102 | |

Note 2. C81 is the capacity of the shielded sound IF coupling lead.
† Items C81A, C81B, C81C, 157A and 157B are combined in one unit.
• Items C83A, C83B, C83C, R64A, R64B and R64C are combined in one unit.

CONTROLS

| ITEM No. | RATING RESISTANCE WATTS | REPLACEMENT DATA | | NOTES |
|----------|-------------------------|--------------------|--------------------|-------|
| | | TRUE TONE PART No. | CENTRALAB PART No. | |
| R1A | 500K | B10A-25471 | P1-40 | |
| B | 1Meg | | R2-52 | |
| C | Switch | | KB-1 | |
| R2A | 15K | B10B-25472 | ABT-154 | |
| B | 150K | B10B-25472 | AB-43 | |
| R3A | 50K | B10B-25472 | AK-4 | |
| B | 50K | B10B-25472 | AK-4 | |
| R4A | 50K | B10B-25472 | AK-4 | |
| B | 50K | B10B-25472 | AK-4 | |
| R5A | 3Meg | B10B-25472 | B-84 | |
| B | 3Meg | B10B-25472 | B-84 | |
| R6A | 2500K | B10B-25472 | • B-7 | |
| B | 2500K | B10B-25472 | • B-7 | |
| R7A | 50K | B10B-25472 | AK-19 | |
| B | 50K | B10B-25472 | AK-19 | |
| R8A | 750K | A10D-23857 | B-84-S | |
| B | 750K | A10D-23857 | B-84-S | |
| R9A | 3Meg | B10A-25667 | KSS-3 | |
| B | 3Meg | B10A-25667 | KSS-3 | |
| C | Switch | | SW-12 | |

• Connect a 220K resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
† Universal Replacement (Mallory Exact Duplicate Part No. UE14888).
• Concentrik Equivalent: K-2 Kit, Base Elements and Shafts; B11-133 & P1-226 (Panel) B13-137 & R2-310 (Rear) 76-1 (Switch)

Note 1. Switch not used.

RESISTORS

| ITEM No. | RATING OHMS WATT | REPLACEMENT DATA | | NOTES |
|----------|------------------|--------------------|--------------|-------|
| | | TRUE TONE PART No. | IRC PART No. | |
| R10 | 680K | | BTS-680K | |
| R11 | 470K | | BTS-470K | |
| R12 | 820K | | BTS-820K | |
| R13 | 470K | | BTS-470K | |
| R14 | 10K | | BTS-10K | |
| R15 | 10K | | BTS-10K | |
| R16 | 390K | | BTS-390K | |
| R17 | 220K | | BTS-220K | |
| R18 | 47K | | BTS-47K | |
| R19 | 15K | | BTS-15K | |
| R20 | 10Meg | | BTS-10Meg | |
| R21 | 1.2Meg | | BTS-1.2Meg | |
| R22 | 470K | | BTS-470K | |
| R23 | 100K | | BTS-100K | |
| R24 | 100K | | BTS-100K | |
| R25 | 47K | | BTS-47K | |
| R26 | 47K | | BTS-47K | |
| R27 | 100K | | BTS-100K | |
| R28 | 100K | | BTS-100K | |
| R29 | 47K | | BTS-47K | |
| R30 | 270K | | BTS-270K | |
| R31 | 47K | | BTS-47K | |
| R32 | 100K | | BTS-100K | |
| R33 | 100K | | BTS-100K | |
| R34 | 900K | | BTS-900K | |
| R35 | 22K | | BTS-22K | |
| R36 | 100K | | BTS-100K | |
| R37 | 270K | | BTS-270K | |
| R38 | 270K | | BTS-270K | |
| R39 | 100K | | BTS-100K | |
| R40 | 100K | | BTS-100K | |
| R41 | 33K | | BTS-33K | |
| R42 | 100K | | BTS-100K | |
| R43 | 680K | | BTS-680K | |
| R44 | 1Meg | | BTS-1Meg | |
| R45 | 390K | | BTS-390K | |
| R46 | 100K | | BTS-100K | |
| R47 | 330K | | BTS-330K | |
| R48 | 470K | | BTS-470K | |
| R49 | 33K | | BTS-33K | |
| R50 | 47K | | BTS-47K | |

Note 2

RESISTORS (cont)

| ITEM No. | RATING OHMS WATT | REPLACEMENT DATA | | NOTES |
|----------|------------------|--------------------|--------------|-------|
| | | TRUE TONE PART No. | IRC PART No. | |
| R59 | 100K | 9B1-50 | 5HK-D2 | |
| R60 | 470K | 9B1-94 | 2TM-P1 | |
| R61 | 5600K | 9C12-1108 | | |
| R62 | 82K | 9B2-85 | BTA-82K | |
| R63 | 4.7K | 9C1-1071 | BW1-4.7 | |
| R64 | 2500K | 9C-24033 | PW7-2500 | |

Note 1. Some versions use a 82K 1W resistor in this application (Mfr. Part No. 9B1-85).
Note 2. Some versions use a 3.9Meg 1W resistor in this application (Mfr. Part No. 9B1-105).
Note 3. Some versions use a 47K 1W resistor in this application (Mfr. Part No. 9B1-82).
† Items R57A, R57B, C61A, C61B, C61C are combined in one unit.
• Items R64A, R64B, R64C, C63A, C63B, C63C are combined in one unit.

TRANSFORMER (FILAMENT)

| ITEM No. | RATING PRI. SEC. 1 SEC. 2 SEC. 3 | REPLACEMENT DATA | | NOTES |
|----------|-------------------------------------|--------------------|---------------------|-------|
| | | TRUE TONE PART No. | Holldorson PART No. | |
| T1 | 117VAC 12.6VCT 12V 0.73A 0.46A 0.8A | 12D-25564 | | |

TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA | | NOTES |
|----------|-----------------------------|--------------------|---------------------|-------|
| | | TRUE TONE PART No. | Holldorson PART No. | |
| T2 | Horiz. Output Trans. | 12E-26424 | FB448 * | |
| T3 | Vert. Output Trans. | 12E-18048-2 | Z1900 ① ② | |
| T4A | Yoke (90°) Horiz. (18.5MHz) | 201-25360 | DF607 ⑤ | |
| B | Vert. (39MHz) | 16M-23770 ④ | | |

① Connect as auto transformer.
② Use 10 to 1 turns ratio.
③ Drill new mounting hole(s).
④ Yoke rear cover and centering device.
⑤ Use original rear cover and centering device.
⑥ Loosen and rotate core clamp to duplicate original mounting.
⑦ Connect horizontal damping network across terminals #3 and #7. Use original if necessary.
⑧ Use original horizontal damping network if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

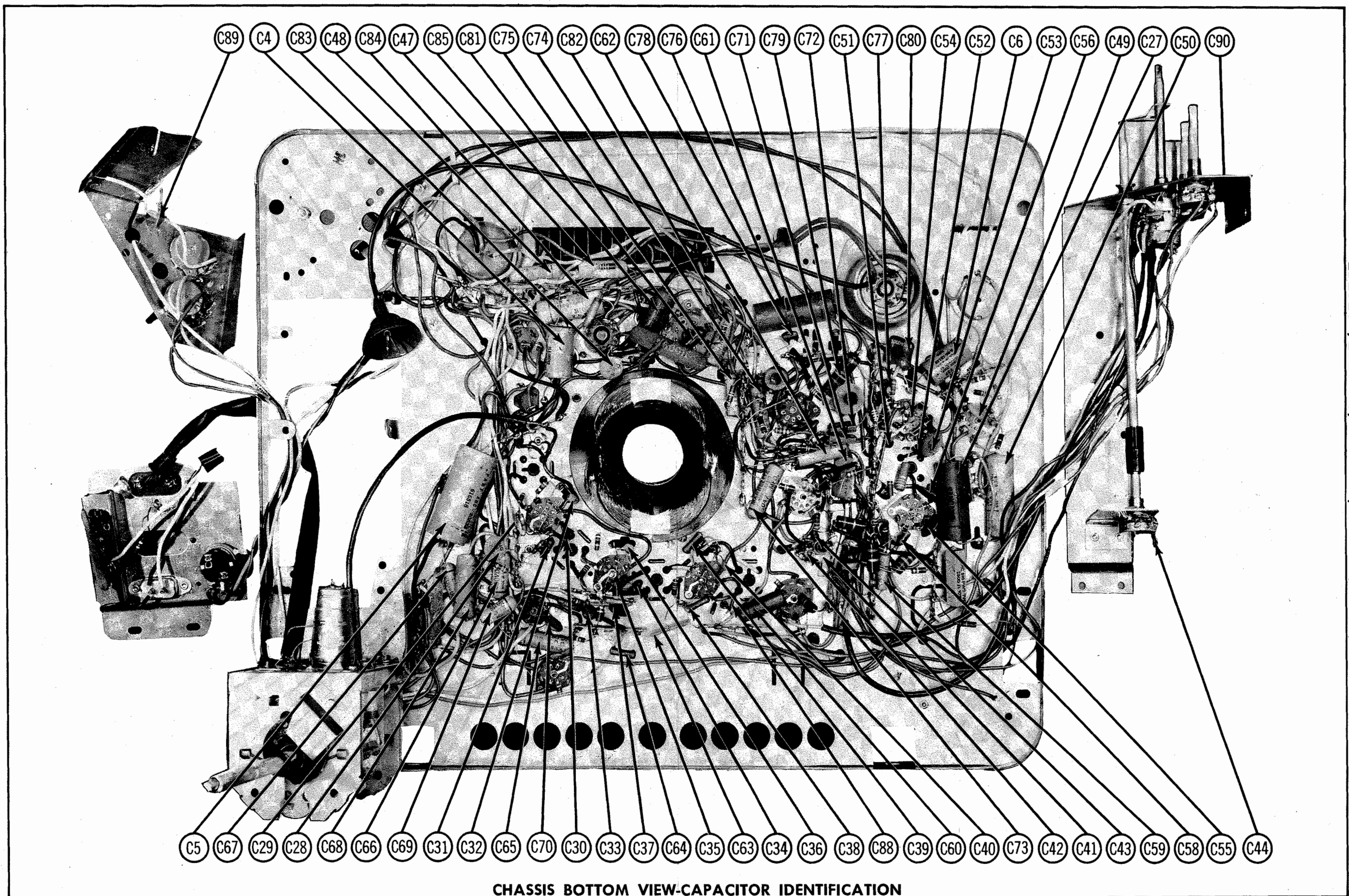
Use Original Width Coil Unless Replacement Type Is Listed

| ORIGINAL TERMINAL CONNECTIONS | Holldorson Replacement Connections | Merit Replacement Connections | RCA Replacement Connections | Rom Replacement Connections | Stancor Replacement Connections | Thordarson Replacement Connections | Triod Replacement Connections |
|-------------------------------|------------------------------------|-------------------------------|-----------------------------|-----------------------------|---------------------------------|------------------------------------|-------------------------------|
| 8 | 8 | 8 | | 8 | | 8 | 8 |
| 3 | 3 | 6 | | 6 | | 6 | 3 |
| 2 | 3 | 6 | | 6 | | 6 | 3 |
| 6 | 6 | See Note ① | | See Note ③ | | See Note ③ | 6 |
| 1 | 2 | 2 | | 2 | | 2 | 2 |
| Special Notes | | ③ | | ③ | | ③ | |

③ Change AGC coupling capacitor C49 to approximately 30 to 100MFD @ 3KV.

TRANSFORMER (AUDIO OUTPUT)

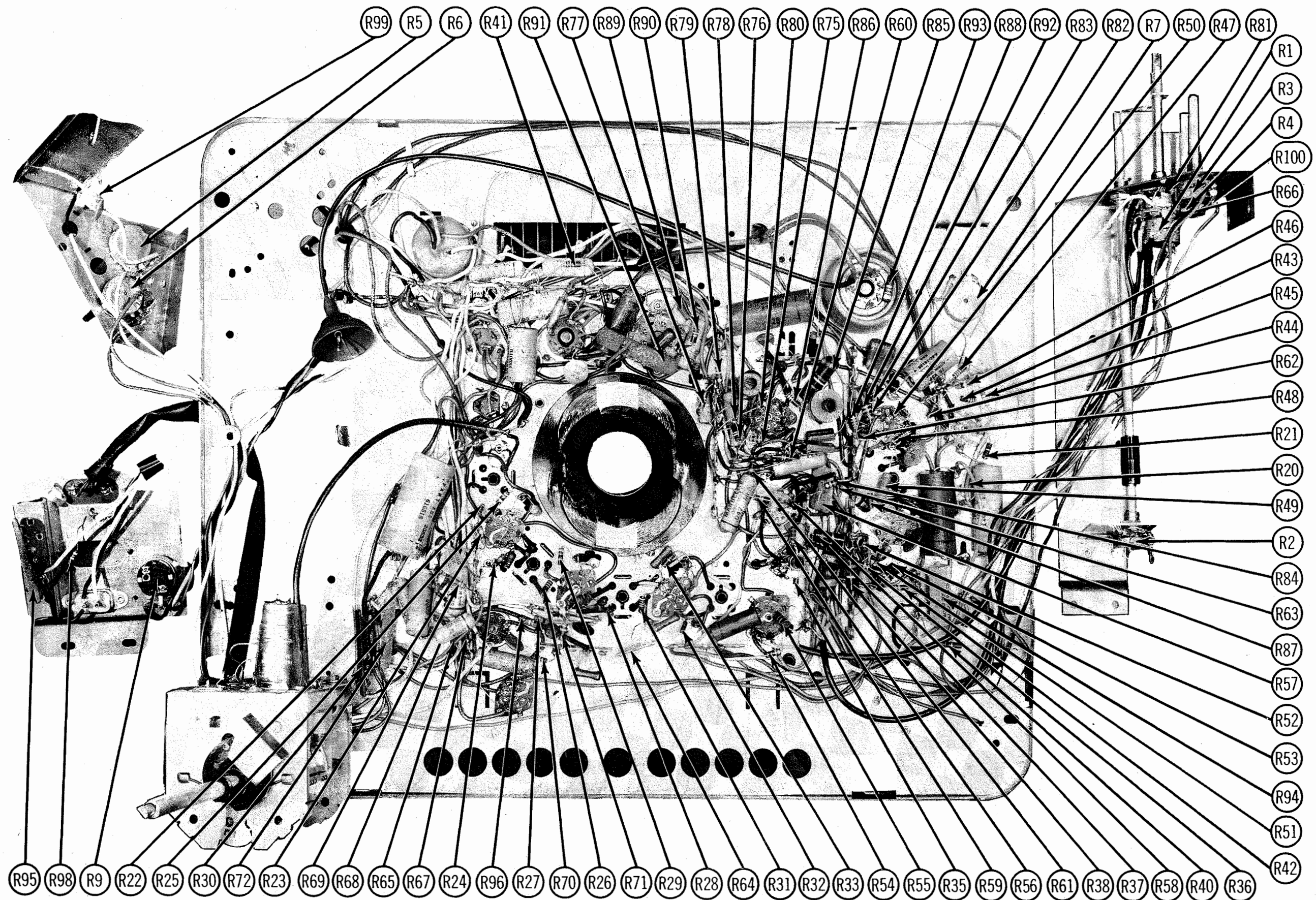
| ITEM No. | IMPEDANCE PRI. SEC. | REPLACEMENT DATA | | NOTES |
|----------|---------------------|--------------------|---------------------|-------|
| | | TRUE TONE PART No. | Holldorson PART No. | |
| T5 | 6.5K 3-4K | 12C-24170 | Z1004 | |



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TRUETONE MODELS 2D1520A, 2D1521A, 2D1522A,
2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33)

SET 316 FOLDER 15



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

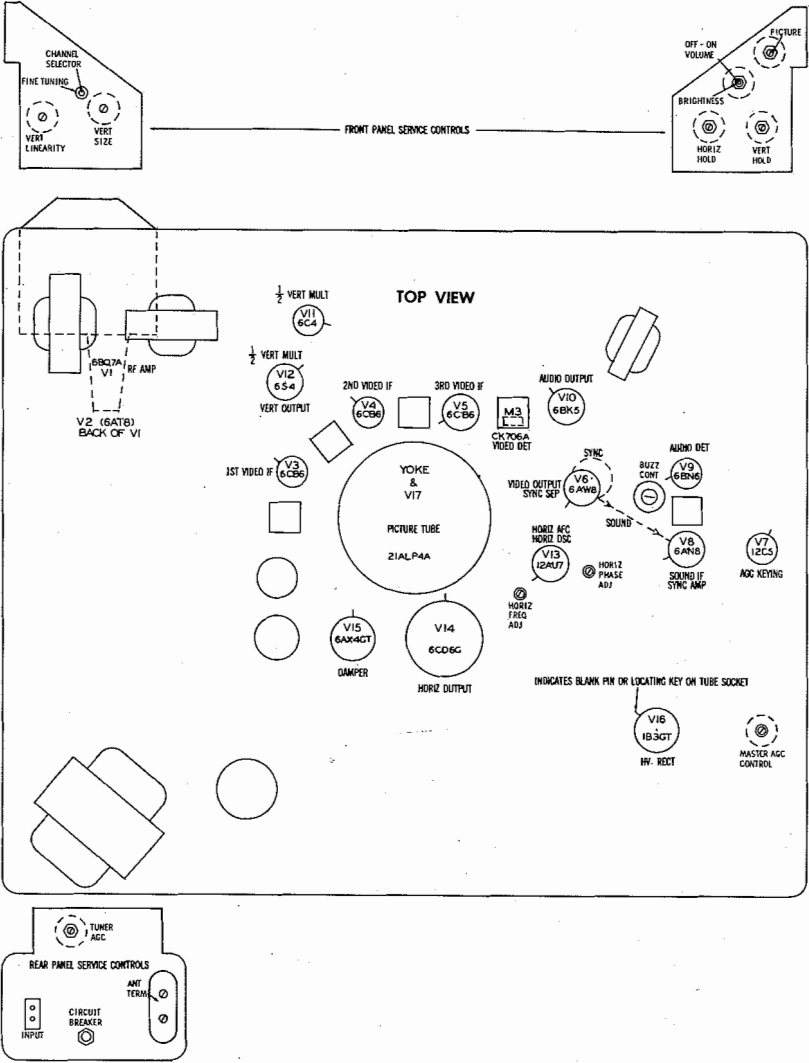
TRUE TONE MODELS 2D1520A, 2D1521A, 2D1522A,
2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33)

RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|------|---------|---------|----------|----------------|-----------------|-------------------|---------------|---------|---------|-------------------|
| V 1 | 6BQ7A | INF | 1.5Meg | 0Ω | 0Ω | .1Ω | † 43Ω | 300KΩ | INF | 0Ω |
| V 2 | 6AT8 | 10KΩ | † 6.4KΩ | 0Ω | 0Ω | .1Ω | † 18KΩ | † 50KΩ | 0Ω | 220KΩ |
| V 3 | 6CB6 | 100KΩ | 47Ω | 0Ω | .1Ω | † 3.7KΩ | † 3.7KΩ | 0Ω | | |
| V 4 | 6CB6 | 100KΩ | 47Ω | 0Ω | .1Ω | † 3.7KΩ | † 3.7KΩ | 0Ω | | |
| V 5 | 6CB6 | .1Ω | 150Ω | 0Ω | .1Ω | † 3.7KΩ | † 3.7KΩ | 0Ω | | |
| V 6 | 6AW8 | 0Ω | 2.2Meg | † 70KΩ | 0Ω | .1Ω | 0Ω | 3.9KΩ | † 2.5KΩ | † 2.5KΩ |
| V 7 | 12C5 | † 22KΩ | † 40KΩ | INF | INF | † 40KΩ | ▲ 800KΩ | 500KΩ | | |
| V 8 | 6AN8 | † 8.2KΩ | 22KΩ | 0Ω | 0Ω | .1Ω | † 33KΩ | † 33KΩ | 470KΩ | 47Ω |
| V 9 | 6BN6 | 250Ω | .3Ω | 0Ω | .1Ω | † 18KΩ | 4.9Ω | † 220KΩ | | |
| V 10 | 6BK5 | † 400Ω | NC | 150KΩ | .1Ω | 0Ω | 150Ω | 150KΩ | † 43Ω | TP |
| V 11 | 6C4 | ▲ 4Meg | NC | .1Ω | 0Ω | ▲ 4Meg | 100KΩ | 100KΩ | | |
| V 12 | 6S4 | NC | 800Ω | 2.2Meg | 0Ω | .1Ω | 2.2Meg | NC | NC | ▲ 5.4KΩ |
| V 13 | 12AU7 | † 35KΩ | 320KΩ | 0Ω | 0Ω | 0Ω | † 25KΩ | 1.5Meg | 300KΩ | .1Ω |
| V 14 | 6CD6G | TP | .1Ω | 0Ω | TP | 470KΩ | TP | 0Ω | † 5.6KΩ | TOP CAP ▲ 7.5Ω |
| V 15 | 6AX4GT | TP | NC | 80KΩ | NC | † 43Ω | TP | 0Ω | .1Ω | |
| V 16 | 1B3GT | | PINS 1-8 | HAVE | INF | RESISTANCE | | | | TOP CAP ▲ 270Ω |
| V 17 | 21ALP4A | 0Ω | 33KΩ | PIN 6 † 43Ω | PIN 10 † 43Ω | PIN 11 † 230KΩ | PIN 12 .1Ω | | | |

† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V15.
NC-NO CONNECTION.
TP-TIE POINT.

TUBE PLACEMENT CHART

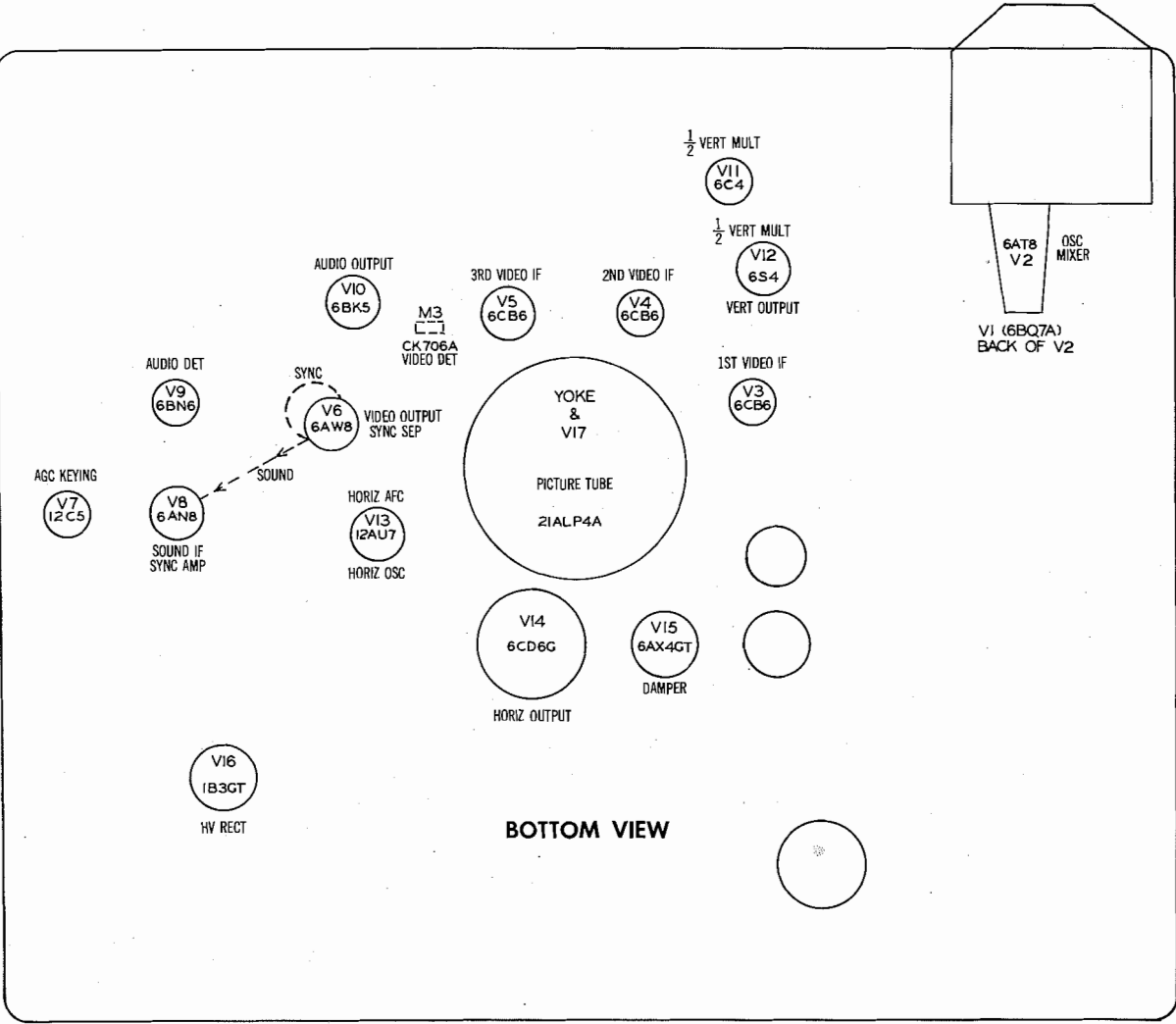


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

- POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2), Circuit breaker (M3)
- LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V17
Has pic, no sound - V8, V9, V10
Overloaded picture - V7
- SYNC FAILURE
No vert. sync - V8, V11, V12
No horiz. sync - V8, V13
No vert. or horiz. sync - V8, V8
- SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V17
No vertical deflection - V11, V12
Poor vert. linearity or foldover - V11, V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, M1, M2
Vert. off freq. - V8, V11, V12
Horiz. off freq. - V8, V13

TUBE PLACEMENT CHART



TRUETONE MODELS 2D1520A, 2D1521A, 2D1522A,
2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33)

ALIGNMENT INSTRUCTIONS

| ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT | | | | | | | |
|---|---|---|---|--|---|--|---|
| Use an isolation transformer to protect the test equipment. The high voltage lead should be securely taped away from the chassis. | | | | | | | |
| VIDEO IF ALIGNMENT | | | | | | | |
| Connect a .001MFD capacitor across the vertical input terminals of the oscilloscope. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. | | | | | | | |
| DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
| 1. .001MFD | High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis. | Not used | 44.5MC (Unmod.) | 10 | Use VTVM DC probe to point Δ . Common to chassis. | A1 | Attenuate signal generator output to maintain not more than 2 volts at VTVM. Adjust for maximum deflection. |
| 2. " | " | " | 47.25MC | " | " | A2 | Adjust for MINIMUM deflection. |
| 3. " | " | " | 45.4MC | " | " | A3 | Adjust for maximum deflection. |
| 4. " | " | " | 43.0MC | " | " | A4 | " |
| 5. " | " | 43.5MC (10MC Swp.) | 42.5MC 45.5MC | " | Vert. Amp. thru 10K Ω to point Δ . Low side to chassis. | | Use only enough sweep generator output for useable pattern on scope. Check for response curve similar to Fig. 1. If necessary, retouch A1, A3, and A4 for desired response. Adjust A1 for MINIMUM tilt. A3 affects high frequency (45.5MC) side of response curve. A4 affects low frequency (42.5MC) side of curve. |
| 6. Direct | High side to an ungrounded tube shield floating over converter tube. Low side to chassis. | Not used | 41.25MC | " | DC probe to point Δ . Common to chassis. | A5 | Adjust for MINIMUM deflection. |
| 7. " | " | 43.5MC (10MC Swp.) | 42.5MC 45.5MC | " | Vert. Amp. thru 10K Ω to point Δ . Low side to chassis. | A6, A7 | Adjust A5 and A6 for response similar to Fig. 2. If necessary, SLIGHTLY retouch A1 for MINIMUM tilt. A3 for position of 45.5MC marker, and A4 for position of 42.5MC marker. |
| SOUND IF ALIGNMENT | | | | | | | |
| Restore the receiver to normal operating condition. Tune in a TV station and adjust the fine tuning until sound bars just appear in the picture. Adjust A8 fully counter clockwise and then clockwise until the lines are smooth and continuous. Readjust fine tuning for clearest picture and best sound. Insert an attenuator in series with the antenna and the antenna terminals so that the signal strength may be varied from weak to strong. If a suitable attenuator is not available, stray feed the signal to the receiver by placing the antenna lead-in near the antenna terminals of the receiver. Reduce the signal input to the receiver so that the signal falls below the limiting level of the 6BN6 as evidenced by a hiss in the sound. Adjust the secondary of the sound take-off transformer (A9), the sound if transformer (A10 and A11), the quatrure coil coil (A12) and the buzz control (R6) for maximum sound and MINIMUM buzz. If hiss disappears during alignment, increase attenuation until hiss reappears. | | | | | | | |
| VHF OSCILLATOR ALIGNMENT | | | | | | | |
| Connect the negative lead of a 1.5 volt battery to the Tuner AGC line. The channel oscillator adjustment screws are reached through a hole just below the channel selector shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 Ω . Set the fine tuning control to the mid-position of its range. | | | | | | | |
| DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
| Two 120 Ω Carbon Resistors | Across VHF antenna terminals with 120 Ω in each lead. | 213MC (10MC Swp.) 207MC (10MC Swp.) 201MC (10MC Swp.) 195MC (10MC Swp.) 189MC (10MC Swp.) 183MC (10MC Swp.) 177MC (10MC Swp.) 171MC (10MC Swp.) 165MC (10MC Swp.) 159MC (10MC Swp.) 153MC (10MC Swp.) 147MC (10MC Swp.) 141MC (10MC Swp.) 135MC (10MC Swp.) 129MC (10MC Swp.) 123MC (10MC Swp.) 117MC (10MC Swp.) 111MC (10MC Swp.) 105MC (10MC Swp.) 99MC (10MC Swp.) 93MC (10MC Swp.) 87MC (10MC Swp.) 81MC (10MC Swp.) 75MC (10MC Swp.) 69MC (10MC Swp.) 63MC (10MC Swp.) 57MC (10MC Swp.) 51MC (10MC Swp.) 45MC (10MC Swp.) 39MC (10MC Swp.) 33MC (10MC Swp.) 27MC (10MC Swp.) 21MC (10MC Swp.) 15MC (10MC Swp.) 9MC (10MC Swp.) 3MC (10MC Swp.) | 211.25MC 205.25MC 199.25MC 193.25MC 187.25MC 181.25MC 175.25MC 169.25MC 163.25MC 157.25MC 151.25MC 145.25MC 139.25MC 133.25MC 127.25MC 121.25MC 115.25MC 109.25MC 103.25MC 97.25MC 91.25MC 85.25MC 79.25MC 73.25MC 67.25MC 61.25MC 55.25MC 49.25MC 43.25MC 37.25MC 31.25MC 25.25MC 19.25MC 13.25MC 7.25MC 1.25MC | 13 12 11 10 9 8 7 6 5 4 3 2 | Vert. Amp. thru 10K Ω to point Δ . Low side to chassis. | A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 | Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%. |

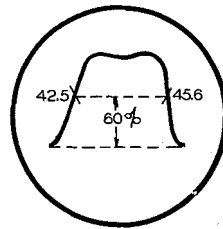


FIG. 1

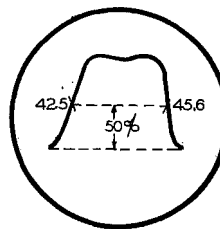


FIG. 2

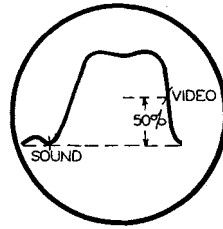


FIG. 3

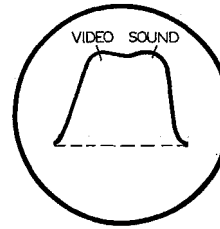


FIG. 4

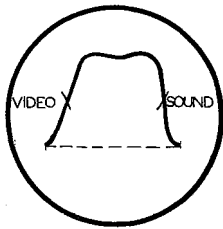


FIG. 5

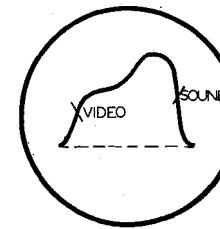


FIG. 6

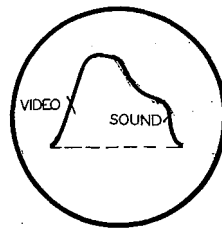


FIG. 7

VHF RF AND MIXER ALIGNMENT

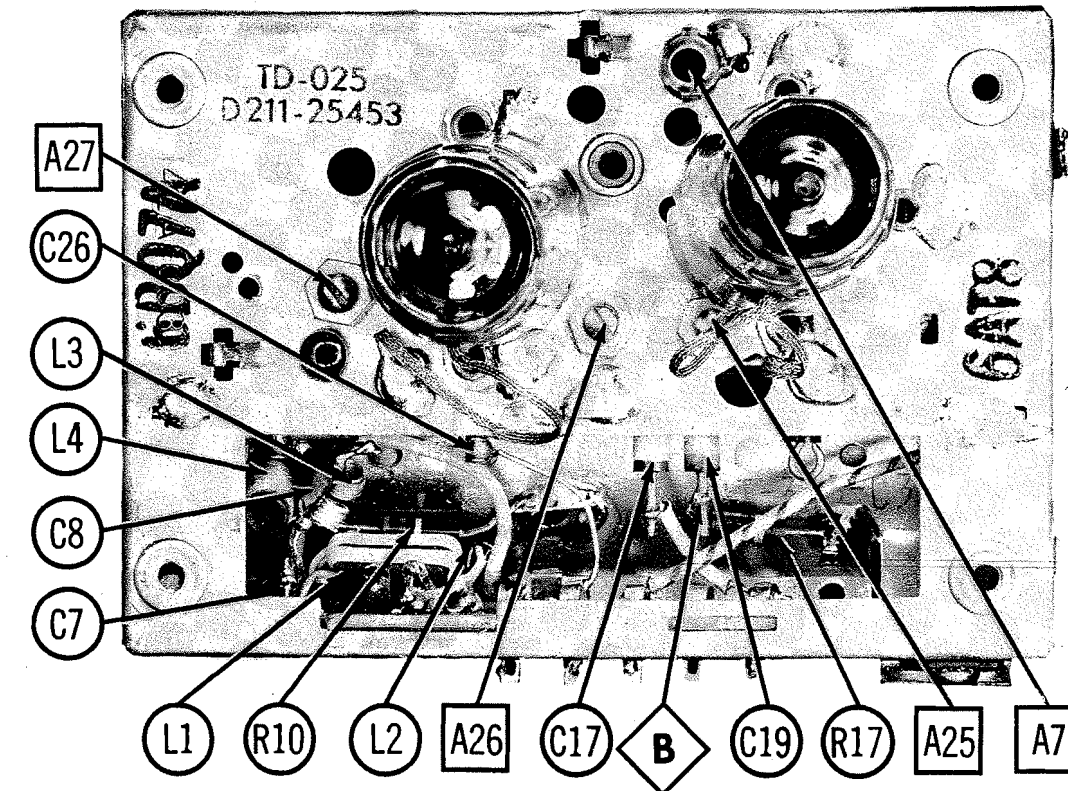
| Connect bias as under "VHF Oscillator Alignment." Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. | | | | | | | |
|--|--|---|---|--|---|---------------|--|
| DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
| 9. Two 120 Ω Carbon Resistors | Across VHF antenna terminals with 120 Ω in each lead. | 195MC (10MC Swp.) | 193.25MC 197.75MC | 10 | Vert. Amp. thru 10K Ω to point Δ . Low side to chassis. | A25, A26, A27 | Adjust for response curve similar to Fig. 4 with markers above 90%. |
| 10. " | " | 213MC (10MC Swp.) 207MC (10MC Swp.) 201MC (10MC Swp.) 195MC (10MC Swp.) 189MC (10MC Swp.) 183MC (10MC Swp.) 177MC (10MC Swp.) 171MC (10MC Swp.) 165MC (10MC Swp.) 159MC (10MC Swp.) 153MC (10MC Swp.) 147MC (10MC Swp.) 141MC (10MC Swp.) 135MC (10MC Swp.) 129MC (10MC Swp.) 123MC (10MC Swp.) 117MC (10MC Swp.) 111MC (10MC Swp.) 105MC (10MC Swp.) 99MC (10MC Swp.) 93MC (10MC Swp.) 87MC (10MC Swp.) 81MC (10MC Swp.) 75MC (10MC Swp.) 69MC (10MC Swp.) 63MC (10MC Swp.) 57MC (10MC Swp.) 51MC (10MC Swp.) 45MC (10MC Swp.) 39MC (10MC Swp.) 33MC (10MC Swp.) 27MC (10MC Swp.) 21MC (10MC Swp.) 15MC (10MC Swp.) 9MC (10MC Swp.) 3MC (10MC Swp.) | 211.25MC 205.25MC 199.25MC 193.25MC 187.25MC 181.25MC 175.25MC 169.25MC 163.25MC 157.25MC 151.25MC 145.25MC 139.25MC 133.25MC 127.25MC 121.25MC 115.25MC 109.25MC 103.25MC 97.25MC 91.25MC 85.25MC 79.25MC 73.25MC 67.25MC 61.25MC 55.25MC 49.25MC 43.25MC 37.25MC 31.25MC 25.25MC 19.25MC 13.25MC 7.25MC 1.25MC | 13 12 11 10 9 8 7 6 5 4 3 2 | | | If markers fall below 70% on any channel, make compromise adjustments of A25, A26, and A27 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected. |

UHF TUNER ALIGNMENT

| If sweep generator has no built-in marker, loosely couple a UHF marker generator to sweep generator output. Use low marker generator output. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. | | | | | | | |
|---|--|---------------------------|----------------------------|---------|---|--------|---|
| DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
| 11. Two 120 Ω Carbon Resistors | Across UHF antenna terminals with 120 Ω in each lead. | 600MC | | 35 | Vert. Amp. thru 10K Ω to point Δ . Low side to chassis. | A28 | Attenuate generator output to maintain only enough signal to obtain desired response. Adjust A28 for response curve similar to Fig. 5. |
| 12. " | " | 470MC | | 14 | " | | Response curve should have tilt similar to Fig. 6. |
| 13. " | " | 670MC | | 60 | " | | Response curve tilt should be similar to Fig. 7. Tilt on response curves in step 12 and 13 should be approximately equal. If not, retouch A28 until they are. |

40 TO 48MC INTERFERENCE TRAP ADJUSTMENT

If IF interference occurs, adjust A28 for MINIMUM interference in picture.



RF TUNER TOP VIEW

TRUE TONE MODELS 2D1520A, 2D1521A, 2D1522A,
2D2526A, 2D2527A, 2D2528A (Ch. 21T31, 21T33)