

MODEL 13C22

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

| TRADE NAME | Emerson | Models | Chassis |
|--------------|---|---------------------------|--------------------------------------|
| | | 13C19, 13C20, 13C21 | 120853A |
| | | 13C22, 13C23, 13C24 | 120855A or B |
| | | 13T07 | 120852A or B |
| SUPPLIER | For current address, see Annual Index. | | |
| TYPE SET | Television Receiver | | |
| TUBES | VHF: Fourteen, UHF: One Transistor | | |
| POWER SUPPLY | 110-120 Volts AC, 60 Cycles | | |
| TUNING RANGE | Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) | | |
| | | RATING | 110 Watts, 1.79 Amps. @ 117 Volts AC |

SERVICING IN THE FIELD**SAFETY GLASS**

The safety glass is an integral part of the picture tube.

FUSE OR FUSE DEVICE

A 1.2-amp. fuse is used for low voltage power supply protection. (See "Tube Placement Chart" for location.)

VHF OSCILLATOR ADJUSTMENT

The Fine Tuning mechanically engages oscillator slug for adjustment (one slug for each channel).

AGC

The AGC may be varied by means of a Picture Optimizer control. (See "Tube Placement Chart" for location.)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the horizontal hold is accomplished by the proper setting of the Horizontal Oscillator coil. (See "Tube Placement Chart" for location.)

WIDTH

The width may be varied by a Width control.

FOCUS

No provision is made to vary the focus on this receiver.

CENTERING

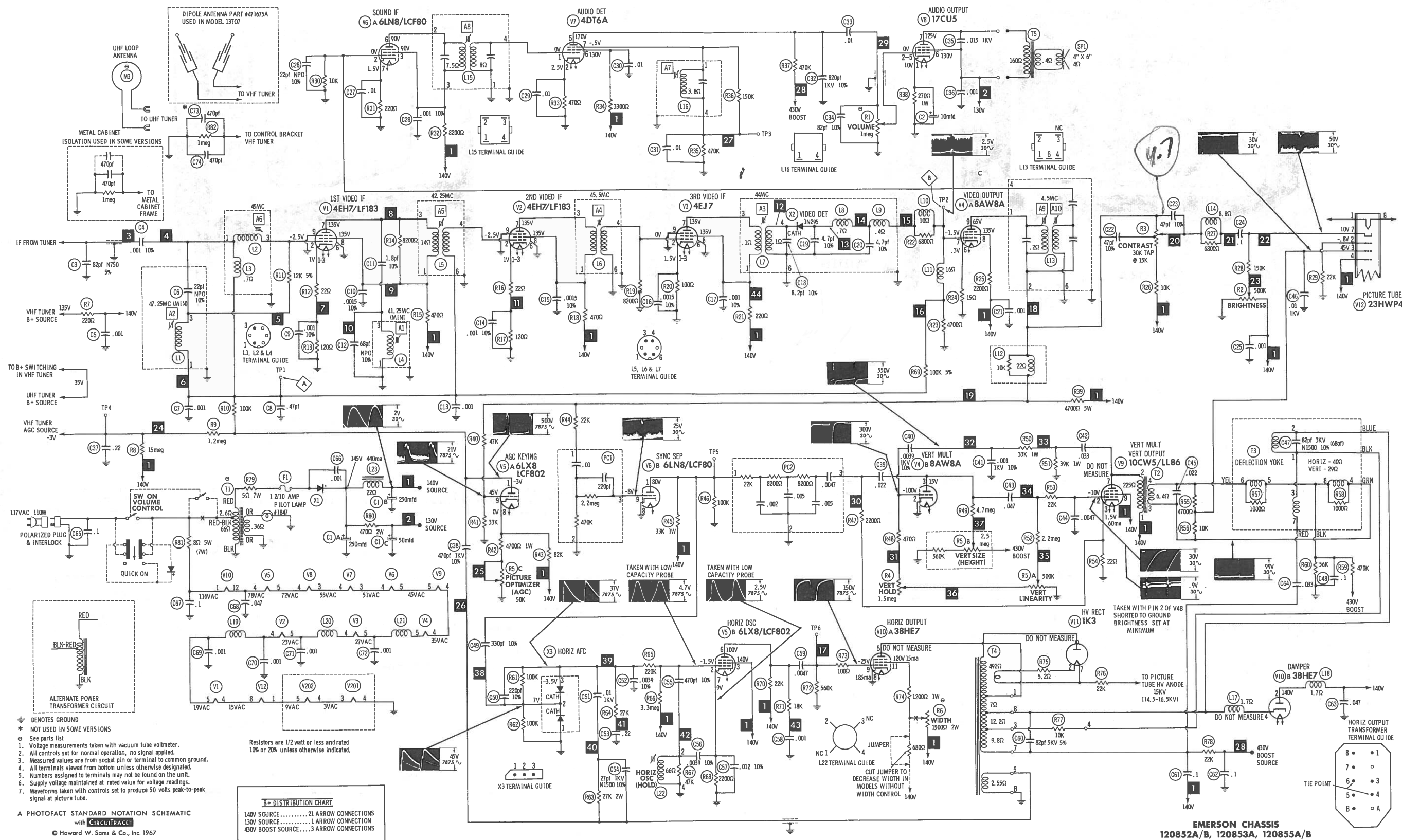
Centering is accomplished by 2 magnetic rings located on yoke rear cover.

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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. SA030 109876543210

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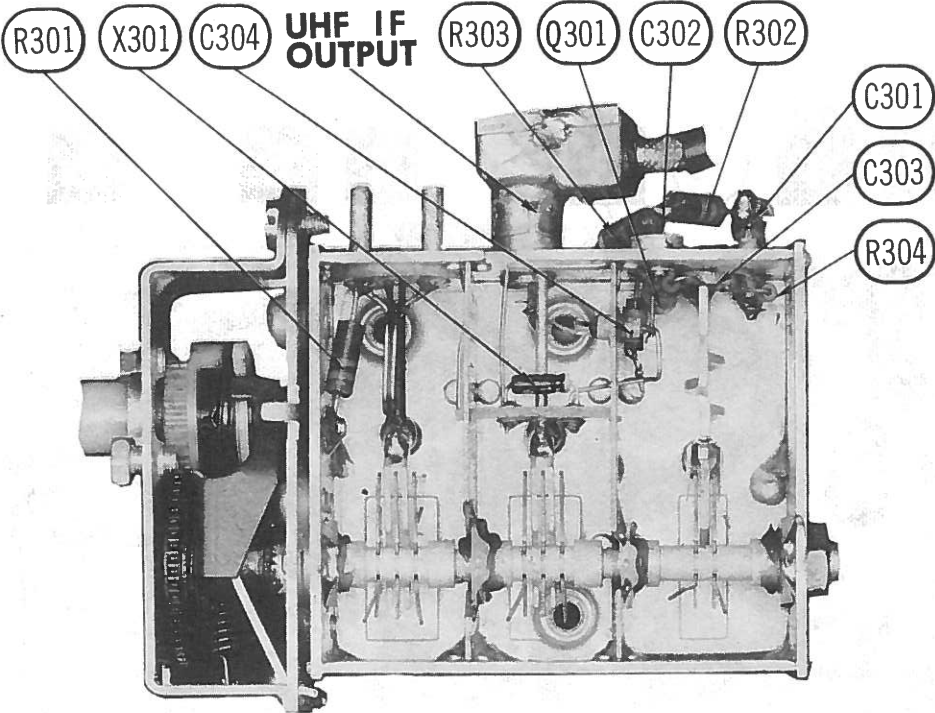
DATE 1 -67**SET 858 FOLDER 1**



RESISTANCE MEASUREMENTS

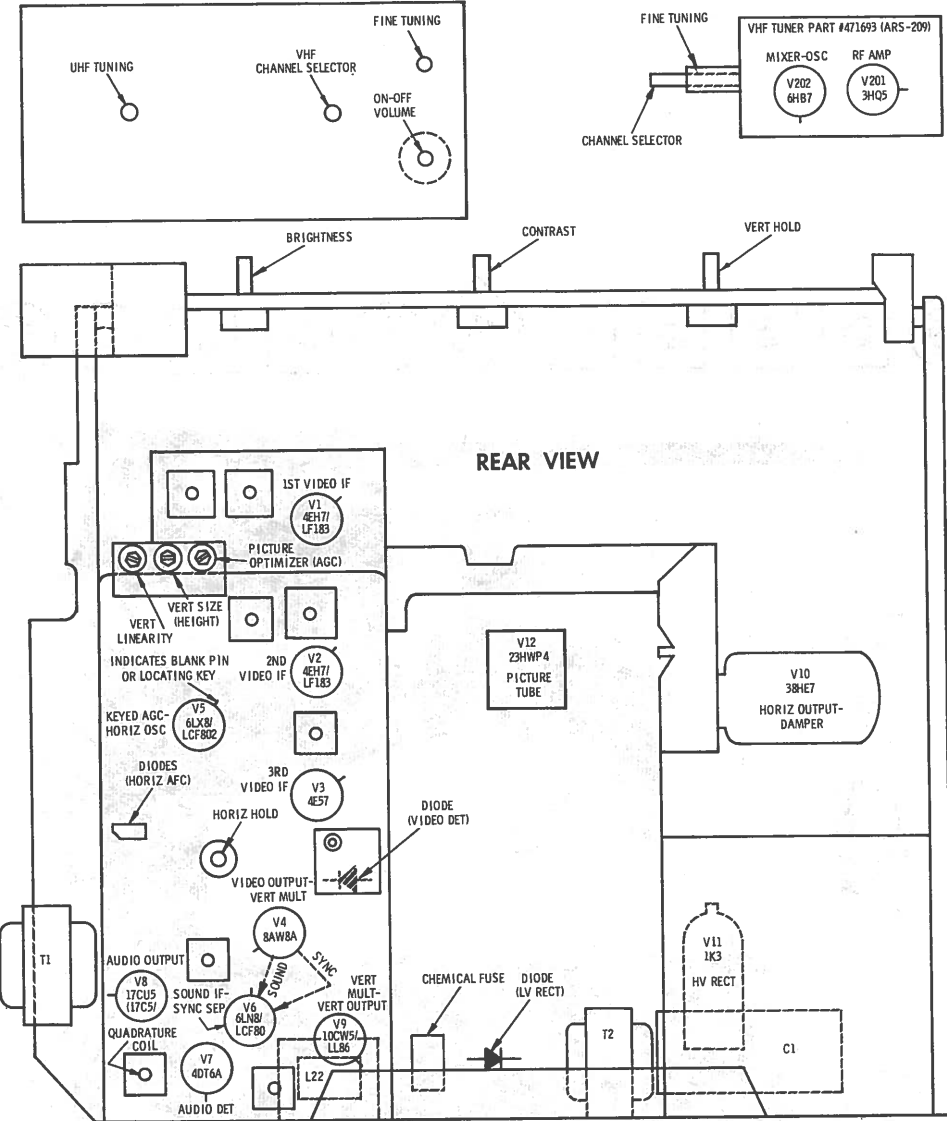
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 | Pin 10 | Pin 11 | Pin 12 |
|------|--------------|--|---------|---------|-------|---------|---------|---------|---------|--------|--------|---------|------------------|
| V1 | 4EH7/ LF183 | 142Ω | 100K | 142Ω | 5Ω | 6.2Ω | 0Ω | 492Ω † | 492Ω † | 0Ω | | | |
| V2 | 4EH7/ LF183 | 142Ω | 100K | 142Ω | 6.2Ω | 8.7Ω | 0Ω | 492Ω † | 492Ω † | 0Ω | | | |
| V3 | 4EJ7 | 100Ω | 0Ω | 100Ω | 8.7Ω | 9Ω | 0Ω | 242Ω † | 242Ω † | 0Ω | | | |
| V4 | 8AW8A | 0Ω | 1.25meg | 5.5meg | 11Ω | 9Ω | 15Ω | 1200Ω • | 2222Ω † | 40K † | | | |
| V5 | 6LX8/ LCF802 | 200K | 380K | 22Ω † | 20Ω | 19Ω | 22K # | 2200Ω | 0Ω | 22K | | | |
| V6 | 6LN8/ LCF80 | 26K † | 10K | 8222Ω † | 15Ω | 13.5Ω | 8222Ω † | 220Ω | 0Ω | 2.5meg | | | |
| V7 | 4DT6A | 8Ω | 470Ω | 15Ω | 16Ω | 492K † | 3322Ω † | 470K | | | | | |
| V8 | 17CU5 | 270Ω | NC | 16Ω | 19Ω | 250K | 470Ω † | 630Ω † | | | | | |
| V9 | 10CW5/ LL86 | NC | 250K | 22Ω | 11Ω | 13.5Ω | NC | 247Ω † | NC | 22Ω † | | | |
| V10 | 38HE7 | 27Ω | 23.7Ω † | NC | 470K | 8.7Ω | NC | NC | 0Ω | 560K | NC | 1750Ω † | 20Ω |
| V11 | 1K3 | PINS 1 THRU 8 HAVE INFINITE RESISTANCE | | | | | | | | | | | TOP CAP 500.7Ω † |
| V12 | 23HWP4 | 3.7Ω | 22K | 61K | 22Ω † | NC | NC | 250K † | 5Ω | | | | |
| V201 | 3HQ5 | 1.3meg | 0Ω | 1.3Ω | 0Ω | 1440Ω † | 0Ω | 0Ω | | | | | |
| V202 | 6BH7 | 0Ω | 220K | 0Ω | 1.3Ω | 3.7Ω | 1240Ω † | 22K † | 4940Ω † | 3300Ω | | | |
| ITEM | TUBE | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 | Pin 10 | Pin 11 | Pin 12 |

THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• READING DEPENDS ON POLARITY OF METER CONNECTIONS.
NC NO CONNECTION
† MEASURED FROM OUTPUT OF X1.
‡ MEASURED FROM PIN 4 OF V10.



UHF TUNER 471674A

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

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

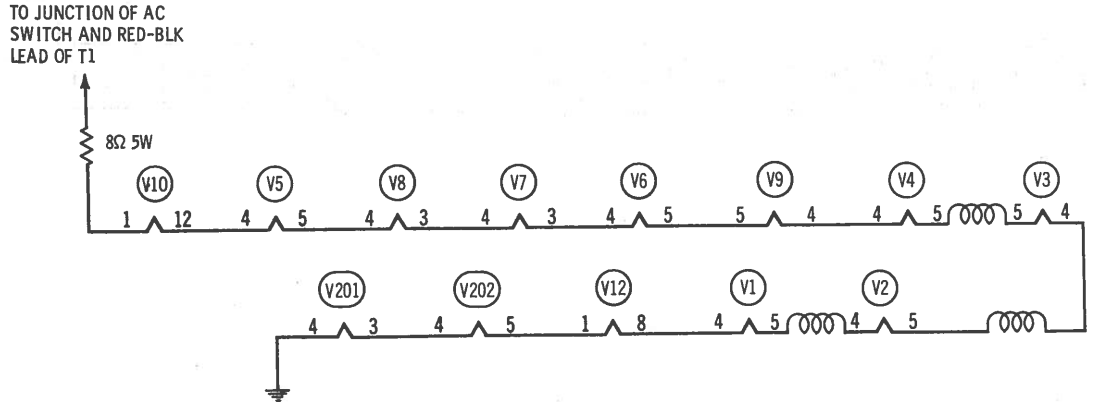
POWER SUPPLY FAILURE
No raster, no sound X1, F1

SWEEP FAILURE
No raster, has sound V5, V10, V11, V12
No vertical deflection V4, V9
Poor vert. linearity or foldover V4, V9
Poor horiz. linearity or foldover V5, V10
Narrow picture V5, V10, X1
Vert. off freq. V4, V9
Horiz. off freq. V5, AFC Diodes X3

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4, Video Detector X2
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V5, V12
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V6
No horiz. sync V8
No vert. or horiz. sync V6

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)

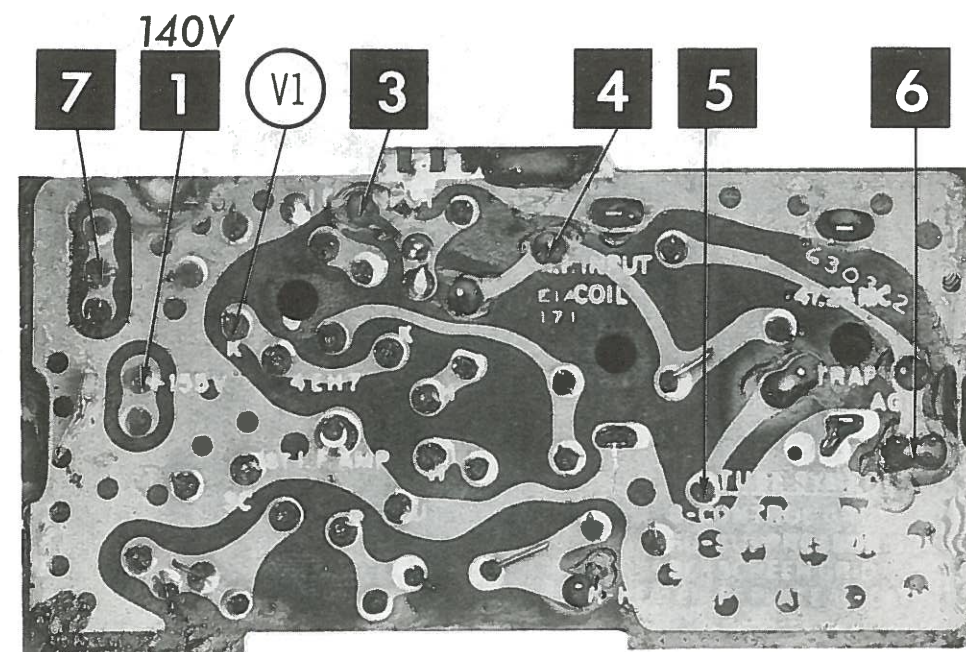
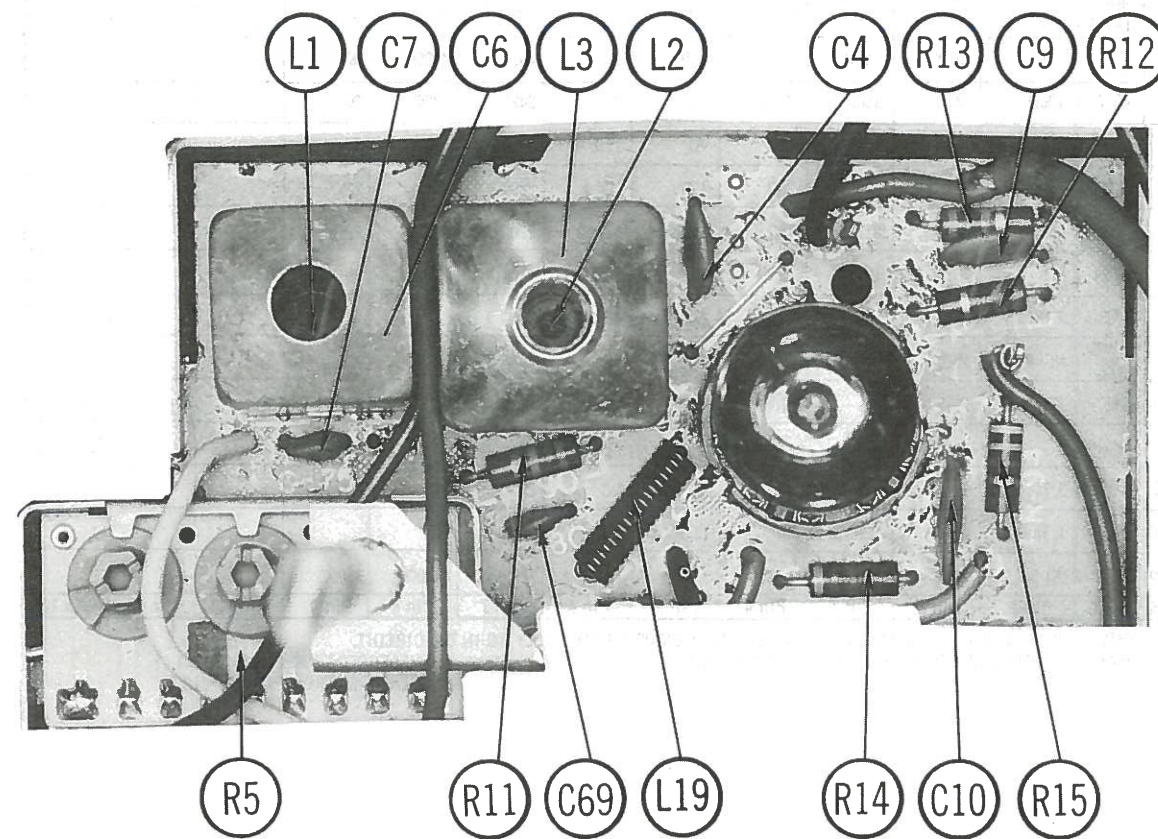


EMERSON CHASSIS
120852A/B, 120853A, 120855A/B

FOLDER 1

Figure 1 is a black and white photograph of the internal chassis of a radio receiver. The chassis is densely packed with electronic components. At the top, there are three large circular capacitors (C34, C3, C7) and a vacuum tube (R1). Below these are various resistors (R26, A2, A6, A1, A5, A4, A3, T4, R75, R76, T2, R6, C45, C56, C46, X1, C66, R80, R65, C65, R55, F1, R79, A8) and a transformer (TP1). A large vacuum tube (A10) is visible in the center. To the right, there are more components including a vacuum tube (A7), a transformer (TP2), and a vacuum tube (T1). The bottom of the chassis features a large capacitor (C34), a vacuum tube (R1), and a vacuum tube (C3). The entire unit is housed in a metal casing with a handle on the left side.

CHASSIS - REAR VIEW



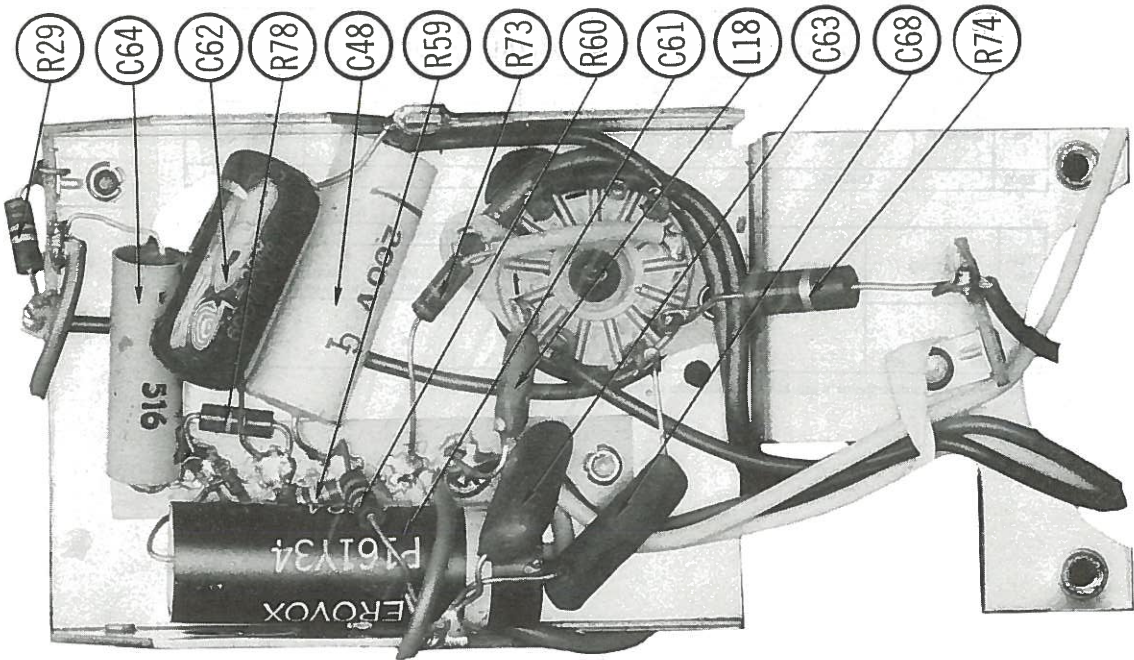
A Howard W. Sams **CIRCUITRACE[®]** **Photo**

ARROWS INDICATING TUBE LOCATIONS ARE
POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

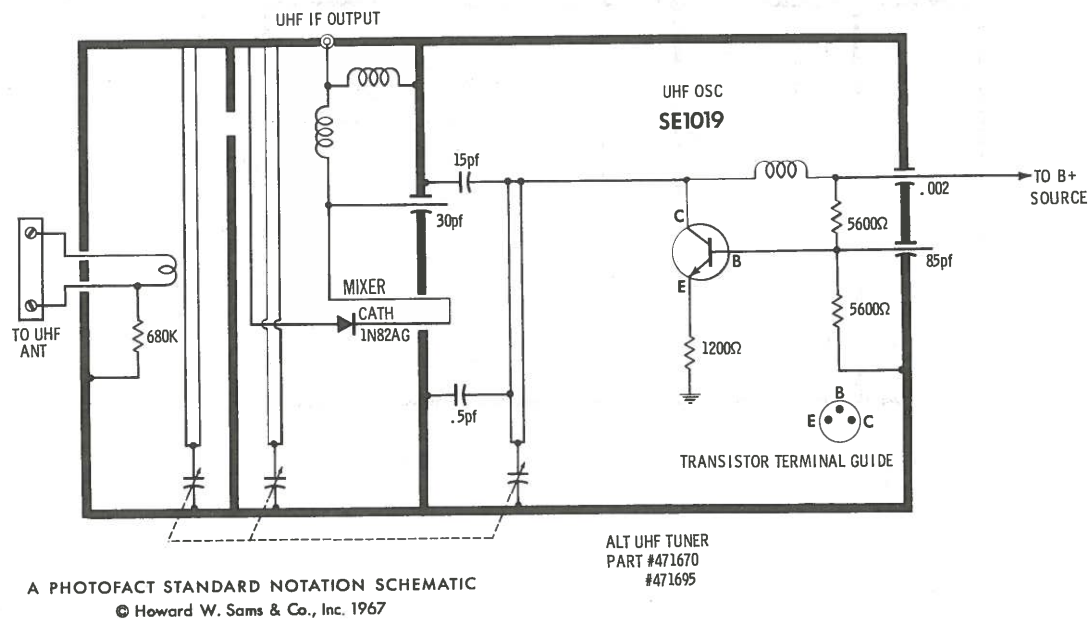
1ST IF PRINTED CIRCUIT BOARD

EMERSON CHASSIS
120852A/B, 120853A, 120855A/B

FOLDER 1



DAMPER CIRCUIT



UHF TUNER 471695, 471670

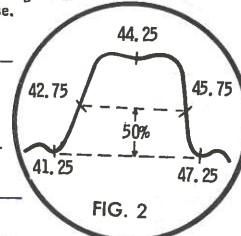
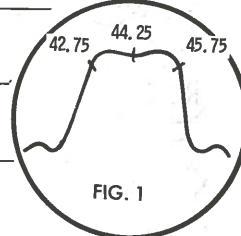
ALIGNMENT INSTRUCTIONS

Use an isolation transformer and maintain voltage at 117 volts. Allow a 20-minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A1 thru A10 GENERAL CEMENT #8606, 8606L, 8869 ... WALSCO #2543, 2544, 2588
Mixer Plate Coil ... GENERAL CEMENT #8606, 8869, 9302 WALSCO #2511, 2543, 2588

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough generator output to provide a usable indication. Note: Response may vary slightly from those shown. Connect a variable bias supply to the IF AGC line (point Ⓟ) and adjust to obtain a response curve which shows no indication of overload. Disable Oscillator section of Mixer-Osc. Set the Channel Selector to any non-interfering channel.

| INDICATOR | GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | ADJUST | REMARKS |
|-----------|--|---------------------------|--|--|---|
| 1. | Connect DC probe of a VTVM thru a 47K resistor to point Ⓟ. Common to ground. | | 41.25 MC 47.25 MC | A1 A2 | Adjust for MINIMUM. |
| 2. | Connect DC probe of a VTVM thru a 47K resistor to point Ⓟ. Common to ground. | | 44 MC 45.5 MC 42.25 MC 45.0 MC | A3 A4 A5 A6 | Adjust for maximum. |
| 3. | Connect vertical input of a scope to point Ⓟ. Low side to ground. | 44 MC (10 MC Sweep) | 41.25 MC 42.75 MC 44.25 MC 45.75 MC 47.25 MC | A3, A4, A5, A6, Mixer Plate Coil | Adjust for maximum gain and symmetry of response with markers as shown in Figure 2. In order to obtain a proper response. |



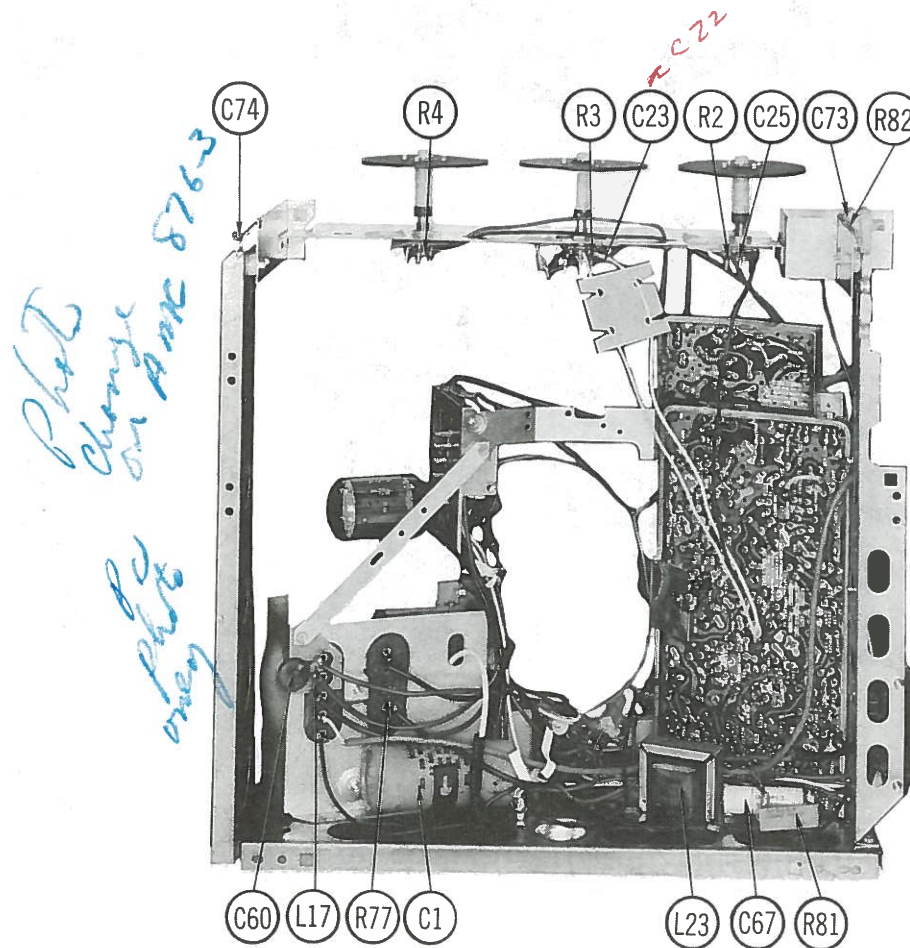
4.5 MC TRAP ALIGNMENT

Tune in a strong TV signal and set the Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible on the screen. Adjust A10 for MINIMUM beat interference.

SOUND IF ALIGNMENT

Tune in a station and adjust A7 for maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce signal while aligning for undistorted output by adjusting A8 and A9.

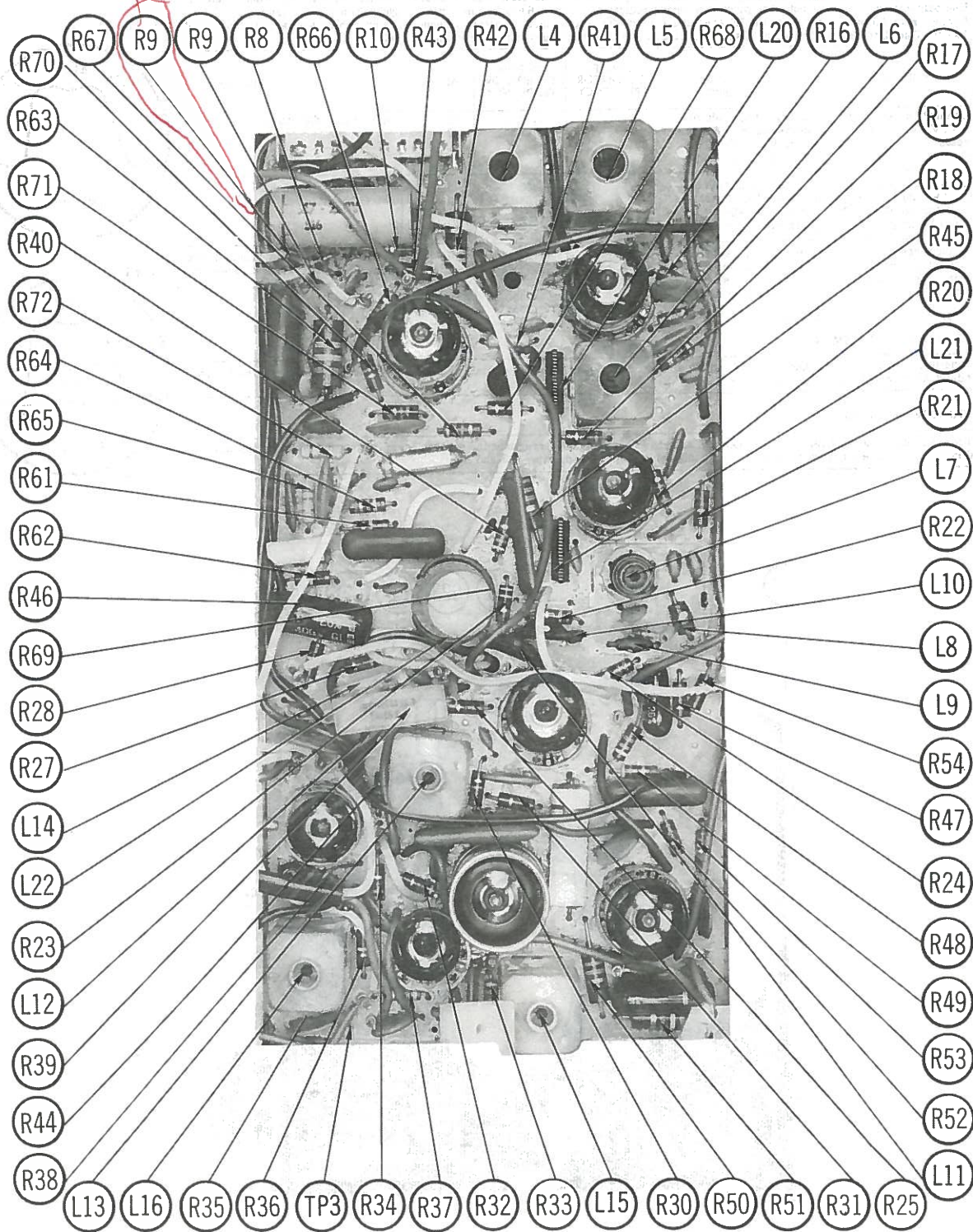
Converted 3-10-67



CHASSIS—FRONT VIEW

Corrected
3-10-67

Photo change
on set 876-3
Ame
PU this photo
only



PRINTED CIRCUIT BOARD

UHF TUNER PARTS LIST

TRANSISTORS

| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | | | NOTES |
|----------|------------|----------------|------------------|---------------------------|--------------|-------|
| | | | DELCO PART No. | GENERAL ELECTRIC PART No. | RCA PART No. | |
| Q301 | S-1019 | UHF Oscillator | | GE-11 | | |

POWER RECTIFIERS & SIGNAL DIODES

| ITEM No. | MEASURED CURRENT | ORIGINAL Part or Type No. | RECTIFIERS & DIODES | | RECTIFIERS | |
|----------|------------------|---------------------------|---------------------------|----------------------------------|------------------|--------------|
| | | | GENERAL ELECTRIC PART No. | INTERNATIONAL RECTIFIER PART No. | MALLORY PART No. | RCA PART No. |
| X301 | | 1N82AG | | | | |

CAPACITORS

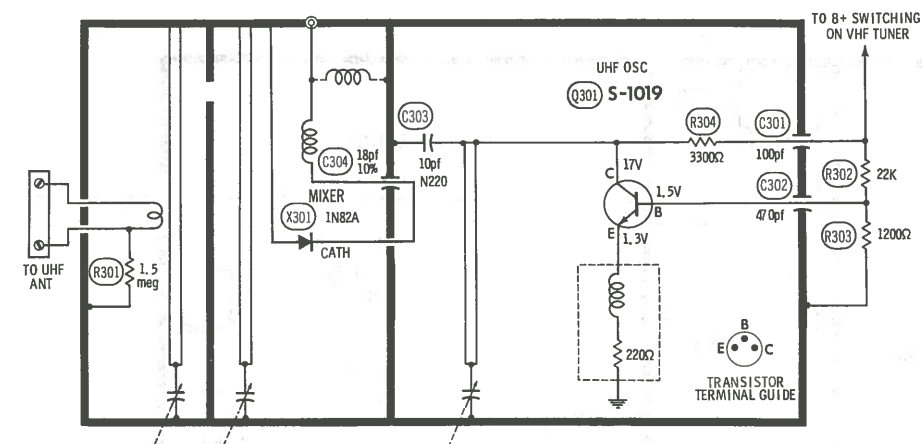
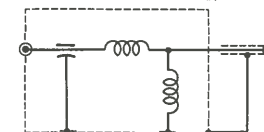
| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|----------|---------|---------|------------------|--------------------|---------------------------|------------------|------------------|------------------|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C301 | 100 | | | | | | | |
| C302 | 470 | | | | | * | * | 10TCR-Q10 |
| C303 | 10 N220 | | | | | | | |
| C304 | 18 10% | | | | | | | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

IF OUTPUT CABLE AND PLUG ASSEMBLY
USED WITH TUNER PART #471645, 471647, 471674,



IF OUTPUT CABLE AND PLUG ASSEMBLY
USED WITH TUNER PART #471674A



A PHOTOFAC STANDARD NOTATION SCHEMATIC
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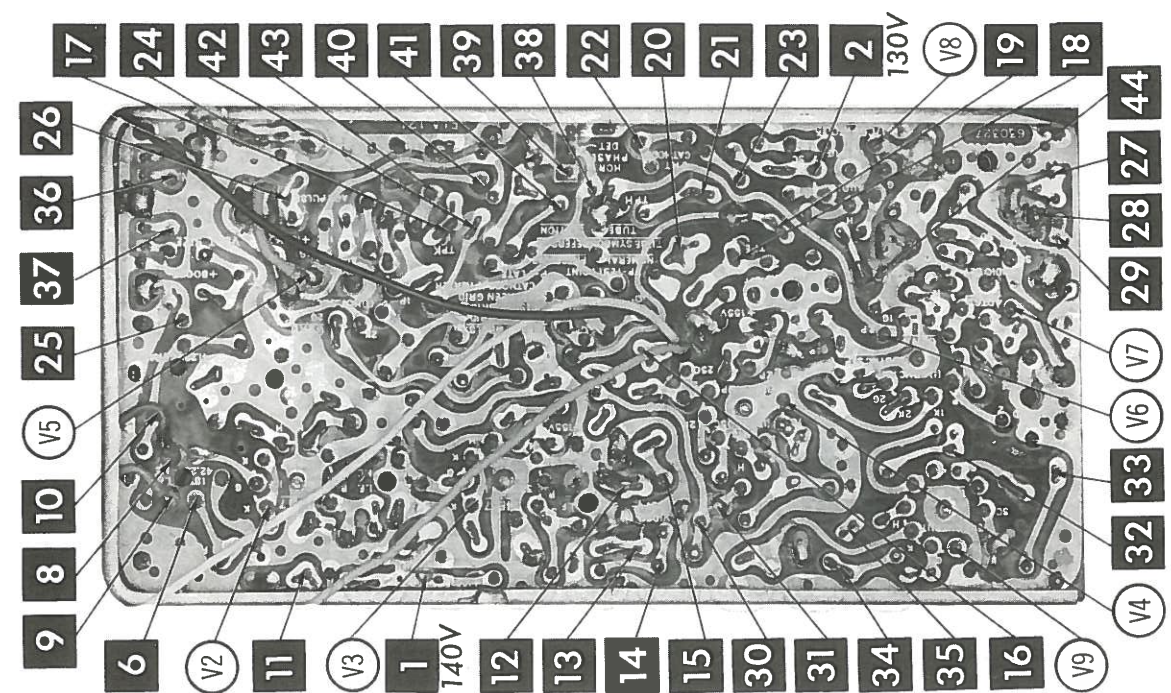
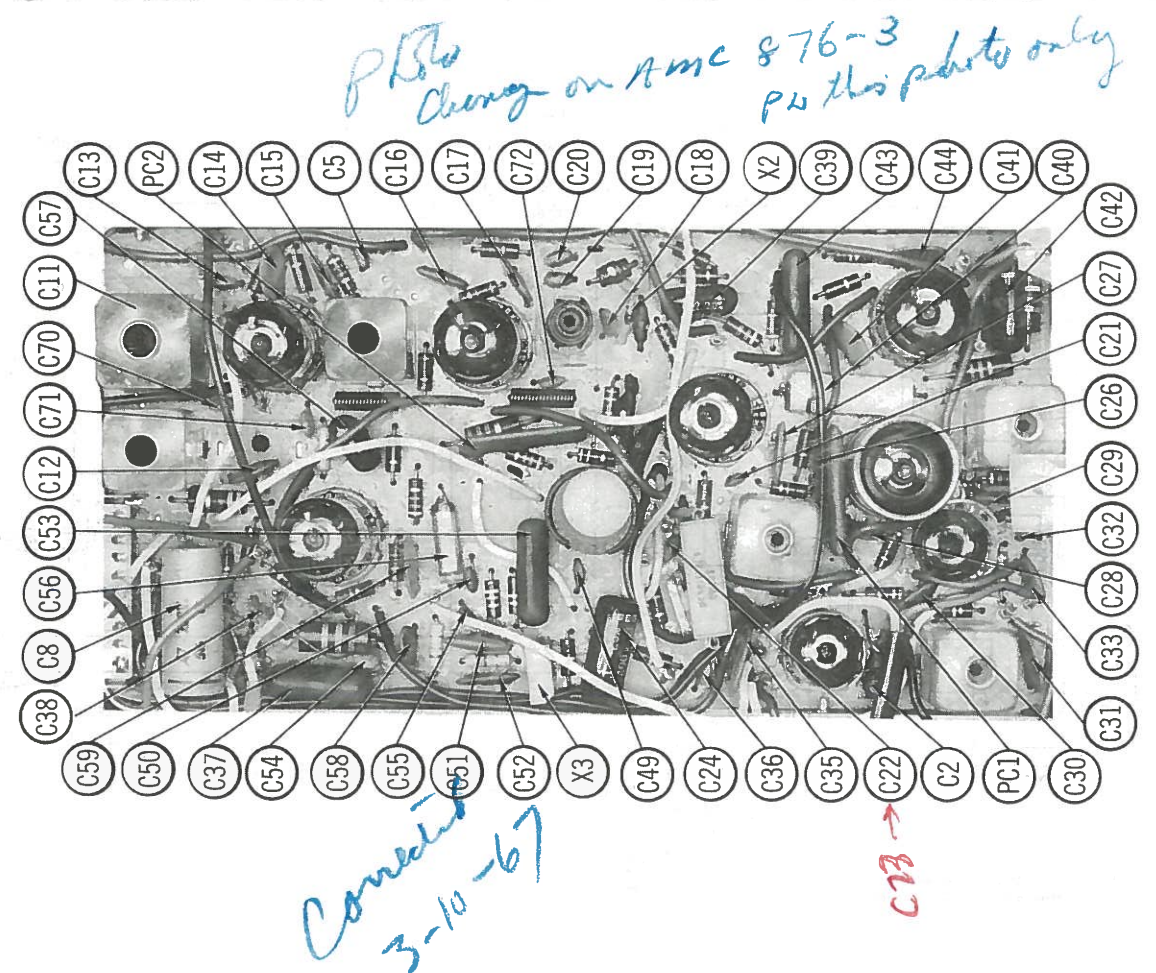
UHF TUNER PART #471674A,

UHF TUNER PHOTO PAGE 18

UHF TUNER 471674A

EMERSON CHASSIS
120852A/B, 120853A, 120855A/B

FOLDER 1

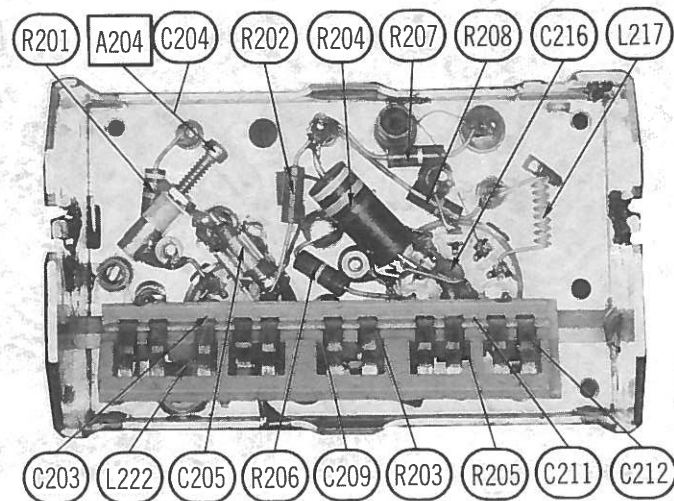
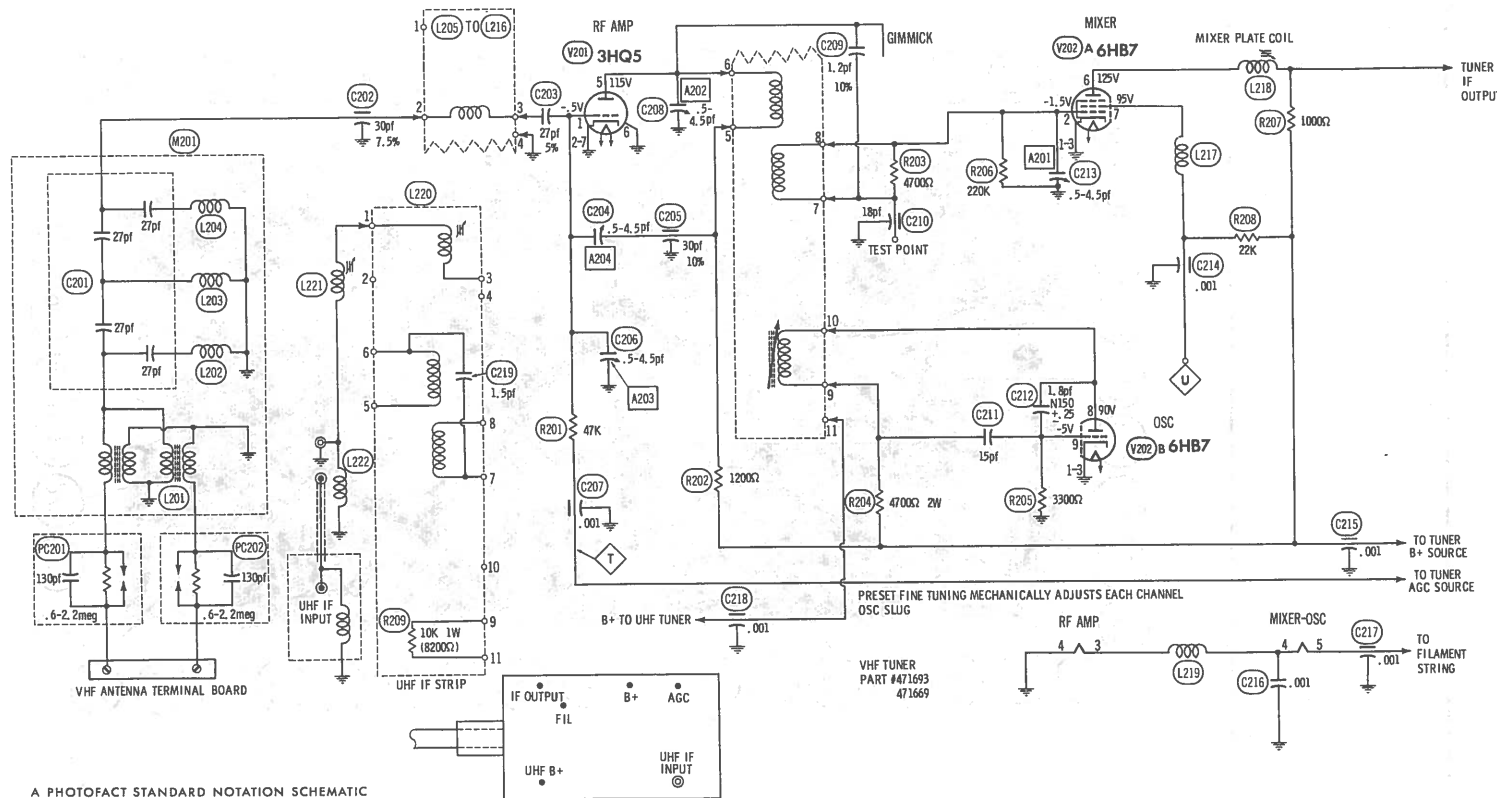
A Howard W. Sams **CIRCUITRACE[®]** Photo

ARROWS INDICATING TUBE LOCATIONS ARE
POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PRINTED CIRCUIT BOARD

EMERSON CHASSIS
120852A/B, 120853A, 120855A/B

FOLDER 1



VHF TUNER ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: A201 thru A204 ... GENERAL CEMENT #8868, 8987, 9089 ... WALSCO #2531-X, 2541, 2587

OSCILLATOR ADJUSTMENTS

The oscillator for each channel is preset by means of the fine tuning control. Adjust fine tuning for best picture and sound on each channel.

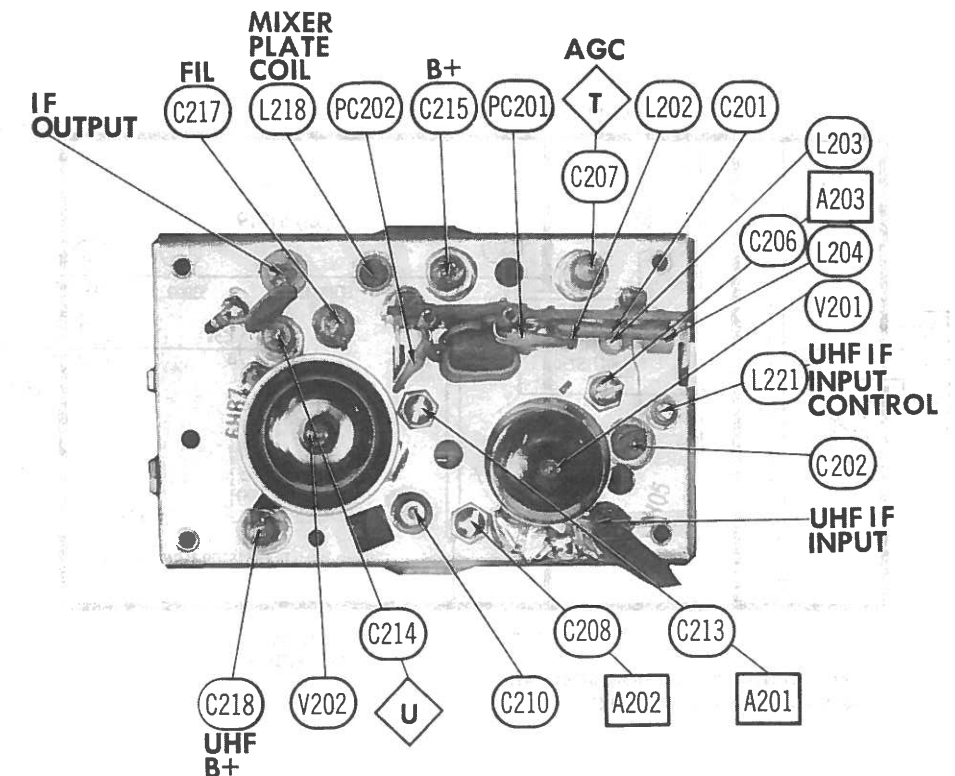
RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use 10MC sweep unless otherwise noted. Connect a variable bias to the RF AGC line at point T. Adjust bias to obtain response curve which shows no indication of overloading.

| SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---------------------------|----------------------------|-----------|---|----------------------|---|
| 1. Across antenna terminals with 120Ω in each lead. | 213MC | 211.25MC 215.75MC | 13 | Vert. Input to Point U, low side to ground | A201 A202 A203 | Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown. |
| 2. " | 195MC | 193.25MC 197.75MC | 10 | Across Video Det. load resistor. | A204 | Increase bias to -15 volts and adjust for MINIMUM amplitude of response. |
| 3. " | See Chart | See Chart | 12 thru 2 | Vert. Input to Point U, low side to ground. | | Decrease bias. Check all channels and make compromise adjustments of A201, A202, and A203 if necessary. |

CHANNEL & FREQUENCY CHART

| SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | |
|---------------------------|----------------------------|---------|---------------------------|----------------------------|---------|---------------------------|----------------------------|---------|--|
| 57MC | 55.25MC 59.75MC | 2 | 85MC | 83.25MC 87.75MC | 6 | 195MC | 193.25MC 197.75MC | 10 | |
| 63MC | 61.25MC 65.75MC | 3 | 177MC | 175.25MC 179.75MC | 7 | 201MC | 199.25MC 203.75MC | 11 | |
| 69MC | 67.25MC 71.75MC | 4 | 183MC | 181.25MC 185.75MC | 8 | 207MC | 205.25MC 209.75MC | 12 | |
| 79MC | 77.25MC 81.75MC | 5 | 189MC | 187.25MC 191.75MC | 9 | 213MC | 211.25MC 215.75MC | 13 | |



VHF TUNER 471693, 471669

| TUBES | | | | | |
|--------------------------|---------|-------------|------------------|---------|------------|
| VHF TUNER 471693, 471669 | | • AMPEREX • | GENERAL ELECTRIC | • RCA • | SYLVANIA • |
| ITEM No. | USE | TYPE | TYPE | USE | TYPE |
| V201 | RF Amp. | 3HQ5 | | | |
| V202 | | | Mixer - Osc. | | 6HB7 |

CAPACITORS

| REPLACEMENT DATA | | | | | | | |
|------------------|--------|---------|------------------|--------------------|---------------------------|------------------|------------------|
| ITEM No. | RATING | REMARKS | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. |
| C201A | 27 | | DI-27 | DD-270 | | CCD-270 | GP427 |
| C201B | 27 | | DI-27 | DD-270 | | CCD-270 | GP427 |
| C201C | 27 | | DI-27 | DD-270 | | CCD-270 | GP427 |
| C202 | 30 | 7.5% | | DD-270 | | CCD-270 | GP427 |
| C203 | 30 | 5% | #965354 | | | CCD-270 | GP427 |
| C204 | 30 | 5% | #964696 | | | CCD-270 | GP427 |
| C205 | 30 | 10% | #965356 | | | CCD-270 | GP427 |
| C206 | 30 | 10% | #964696 | | | CCD-270 | GP427 |
| C207 | 30 | 10% | #964696 | | | CCD-270 | GP427 |
| C208 | 30 | 10% | EF-001 | MFT-1000 | | CCF-102 | CT280A |
| C209 | 30 | 10% | DI-15 | DD-150 | | CCD-150 | GP415 |
| C210 | 30 | 10% | | | | CCD-150 | GP415 |
| C211 | 30 | 10% | | | | CCF-102 | CT280A |
| C212 | 30 | 10% | | | | CCF-102 | CT280A |
| C213 | 30 | 10% | | | | CCF-102 | CT280A |
| C214 | 30 | 10% | | | | CCF-102 | CT280A |
| C215 | 30 | 10% | | | | CCF-102 | CT280A |
| C216 | 30 | 10% | | | | CCF-102 | CT280A |
| C217 | 30 | 10% | | | | CCF-102 | CT280A |
| C218 | 30 | 10% | | | | CCF-102 | CT280A |
| C219 | 30 | 10% | | | | CCF-102 | CT280A |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

COILS (RF-IF)

| ITEM No. | USE | REMARKS | EMERSON PART No. | USE | EMERSON PART No. | NOTES |
|----------|-----------------------|---------|------------------|-----------------------|------------------|---------------|
| L201 | Balun | | | Ant., RF, Osc., Mixer | 964689 | Channel 9, IF |
| L202 | RF Choke | | | " | 964690 | " 10 " |
| L203 | RF Choke | | | " | 964691 | " 11 " |
| L204 | RF Choke | | | " | 964692 | " 12 " |
| L205 | Ant., RF, Osc., Mixer | | | " | 964693 | " 13 " |
| L206 | " | | | Screen Plate | 964694 | |
| L207 | " | | | Mixer Plate | 964695 | |
| L208 | " | | | Filament Choke | 964696 | |
| L209 | " | | | RF, Osc., Mixer | 964697 | |
| L210 | " | | | UHF IF Input | 964698 | |
| L211 | " | | | UHF Input Shunt | 964699 | |

COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | EMERSON PART No. | REPLACEMENT DATA |
|----------|-------------------|-------------|------------------|------------------|
| PC201 | Antenna Isolation | | | |
| PC202 | Antenna Isolation | | | |

MISCELLANEOUS

| ITEM No. | PART NAME | EMERSON PART No. | NOTES |
|----------|---|--|--|
| M201 | Antenna Input Ass'y Shaft & Turret Ass'y Nylon Gear Nylon Gear Insulated Spacer Nylon Boot | 964920 965590 965591 965592 965593 965594 | Includes L201, L202, L203, L204, C201, PC201, PC202. Less Channel Strips VHF Fine Tuning Drive (Black) VHF Channel Indicator Driving (White) Channel Selector Shaft Channel Selector Shaft and Insulating |

UHF TUNER PARTS LIST AND DESCRIPTION

| TRANSISTORS | | | | |
|-------------|----------------|----------------|------------------|--------------|
| ITEM No. | ORIG. TYPE | USE | REPLACEMENT DATA | |
| | | | DELCO PART No. | RCA PART No. |
| Q301 | SI019 (SE1019) | UHF Oscillator | GE-11 | GE-11 |

POWER RECTIFIERS & SIGNAL DIODES

| RECTIFIERS & DIODES | | | |
|---------------------|------------------|---------------------------|------------------|
| ITEM No. | MEASURED CURRENT | ORIGINAL Part or Type No. | REPLACEMENT DATA |
| X301 | | 1S750 | 1N82A 1N82AG |

CAPACITORS

| REPLACEMENT DATA | | | | |
|------------------|---------|---------|------------------|---------------------------|
| ITEM No. | RATING | REMARKS | AEROVOX PART No. | CORNELL-DUBILIER PART No. |
| C301 | 10 10% | #965071 | | |
| C302 | 10 N220 | #964995 | | |
| C303 | 100 | #965072 | | |
| C304 | 470 | #965069 | | |

* Emerson Part Number

PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements. Have your local distributor check Sams COUNTER FACTS for the most up-to-date replacement.

WIRING DATA

| | |
|---|--|
| High Voltage Lead | Use BELDEN No. 8869 (17KV) or 8868 (25KV) |
| Shielded Hook-up Wire | Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor) |
| General-use Unshielded Hook-up Wire | Use BELDEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors |
| Power Cord (Interlock Type) | Use BELDEN No. 8874 (Rubber) or 8895 (Plastic) |
| 3000Ω Tuner Input Lead | Use BELDEN No. 8225 |
| 3000Ω Antenna Lead-in | Use BELDEN No. 8230 or 8275 |
| Antenna Rotor Cable | Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor |

TUBES

| • AMPEREX • | | | • GENERAL ELECTRIC • | | | • RCA • | | | • SYLVANIA • | | |
|-------------|----------------------------|------------|----------------------|-------------------------|---------------------|----------|----------------------------|------------|--------------|------------------------|-------|
| ITEM No. | USE | TYPE | ITEM No. | USE | TYPE | ITEM No. | USE | TYPE | ITEM No. | USE | TYPE |
| Q301 | UHF Osc. (Transistor) | SE1019 | V5 | Keyed AGC - Horiz. Osc. | 6LX8/LCF802 | V6 | Sound IF - Sync Separator | 6LN8/LCF80 | V7 | Audio Detector | 4DT8A |
| V201 | RF Amp. | 3HQ5 | V8 | Audio Output | 17CU5 (17C5/17CU5)* | V9 | Vert. Mult. - Vert. Output | 10CW5/L86 | V10 | Horiz. Output - Damper | 38HE7 |
| V202 | Mixer - Osc. | 6HB7 | V11 | HV Rectifier | 1K3 | | | | | | |
| V1 | 1st Video IF | 4EH7/LF183 | | | | | | | | | |
| V2 | 2nd Video IF | 4EH7/LF183 | | | | | | | | | |
| V3 | 3rd Video IF | 4EJ7 | | | | | | | | | |
| V4 | Video Output - Vert. Mult. | 8AW8A | | | | | | | | | |

* Alternate

PICTURE TUBE

| ITEM No. | REPLACEMENT DATA | | | | NOTES |
|----------|------------------|---------------------------|--------------|-------------------|----------------------|
| | EMERSON PART No. | GENERAL ELECTRIC PART No. | RCA PART No. | SYLVANIA PART No. | |
| V12 | 23HW P4 | | | 23HW P4 ① | ① Silver Screen "85" |

POWER RECTIFIERS & SIGNAL DIODES

| ITEM No. | MEASURED CURRENT | ORIGINAL Part or Type No. | RECTIFIERS & DIODES | | RECTIFIERS | | |
|----------|------------------|---------------------------|---------------------------|----------------------------------|------------------|--------------------|-------------------------|
| | | | GENERAL ELECTRIC PART No. | INTERNATIONAL RECTIFIER PART No. | MALLORY PART No. | RCA PART No. | SARKES TARZIAN PART No. |
| X1 | .440A | 817068 | GE-504A or GE-505 | 5A4-D or SD500 | 1N540 or 1N2070 | SK-3018 or SK-3017 | F-4 or 40C |
| X2 | | 817077 | 1N60 | 1N60 | | | |
| X3 | | 817074 | 6GC1 | DD04 | | | |

ELECTROLYTIC CAPACITORS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | |
|----------|--------|-------|------------------|------------------|---------------------------|---------------------------|------------------|
| | CAP. | VOLT. | EMERSON PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | GENERAL ELECTRIC PART No. | MALLORY PART No. |
| C1A | 250 | 180 | 925664 | | CC0129.5 | XC3-20 | FP318.85 |
| B | 250 | 180 | | | BR40-250 | QT1-14 | |
| C | 50 | 180 | | | | | |
| C2 | 10 | 25 | 925458 | CRE607A | NLW10-25 | MT1-5 | TT25X10 |

CAPACITORS

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|----------|--------|---------|------------------|--------------------|---------------------------|------------------|------------------|------------------|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ELMENCO PART No. | MALLORY PART No. | SPRAGUE PART No. |
| C3 | 82 | N750 5% | DI-1000 | TCN-82 | JBS601YPI02K | CCD-102 | CN7482 | 10TCU-Q82 |
| C4 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C5 | .001 | 10% | NPO-DI 22 | DTZ-22 | CY601CG220K | CCD-102 | CNO422 | 10TS-D10 |
| C6 | 22 | NPO 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C7 | .001 | 10% | DBE2P47 | DD-102 | DMF2P47 | CCD-102 | PVC2047 | 10TS-D10 |
| C8 | .47 | 200V | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C9 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP215 | 10TS-D10 |
| C10 | .0015 | 10% | DI-1500 | DD-152 | | CCD-152 | GP215 | 10TS-D10 |
| C11 | 1.8 | 10% | | | | | | 10TCC-V18 |
| C12 | .68 | NPO 10% | NPO-DI 68 | DTZ-68 | CX601CG680K | CCD-680 | CNO468 | 10TCC-Q68 |
| C13 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C14 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C15 | .0015 | 10% | DI-1500 | DD-152 | | CCD-152 | GP215 | 10TS-D10 |
| C16 | .0015 | 10% | DI-1500 | DD-152 | | CCD-152 | GP215 | 10TS-D10 |
| C17 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C18 | 8.2 | 10% | DI-8.2 | DD30-8R2 | | | | |
| C19 | 4.7 | 10% | NPO-DI 4.7 | DTZ-4R7 | | | | |
| C20 | 4.7 | 10% | NPO-DI 4.7 | DTZ-4R7 | | | | |
| C21 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | CNO547 | 10TCC-V47 |
| C22 | .47 | 10% | DI-47 | DD-470 | JBS601YPI02K | CCD-470 | GP210 | 10TS-D10 |
| C23 | .47 | 10% | DI-47 | DD-470 | JBS601YPI02K | CCD-470 | GP210 | 10TS-D10 |
| C24 | .1 | 400V | DBE4P1 | DD-102 | DMF4P1 | CCD-102 | PVC601 | 10TS-D10 |
| C25 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C26 | .22 | NPO 10% | NPO-DI 22 | DTZ-22 | CY601CG220K | CCD-220 | CNO422 | 10TCC-Q22 |
| C27 | .01 | 10% | DI-1000 | DD-102 | BYX601ZU103M | CCD-103 | GP110 | 10TS-D10 |
| C28 | .001 | 10% | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |
| C29 | .01 | 10% | DI-1000 | DD-102 | BYX601ZU103M | CCD-103 | GP110 | 10TS-D10 |
| C30 | .01 | 10% | DI-1000 | DD-102 | BYX601ZU103M | CCD-103 | GP110 | 10TS-D10 |
| C31 | .01 | 10% | DI-1000 | DD-102 | BYX601ZU103M | CCD-103 | GP110 | 10TS-D10 |
| C32 | .820 | 1KV 10% | DI-820 | DD-821 | JBY601YPI02K | CCD-821 | GP382 | 10TS-T82 |
| C33 | .820 | 1KV 10% | DI-1000 | DD-102 | BYX601ZU103M | CCD-103 | GP110 | 10TS-D10 |
| C34 | .015 | 1KV | DI-82 | DD-820 | JBY601YPI02K | CCD-820 | GP482 | 10TS-Q82 |
| C35 | .82 | 1KV | BPD-015 | DD-153 | BYT601ZU153Z | CCD-153 | 5HK-S15 | 10TS-D10 |
| C36 | .001 | 1KV | DI-1000 | DD-102 | JBS601YPI02K | CCD-102 | GP210 | 10TS-D10 |

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements.
Have your local distributor check Sams COUNTER FACTS® for the most up-to-date replacement.

CAPACITORS

| ITEM No. | RATING | REMARKS | REPLACEMENT DATA | | | | | |
|----------|------------------|---------|---------------------|-----------------------|----------------------------------|-----------------|---------------------|---------------------|
| | | | AEROVOX PART No. | CENTRALAB PART No. | CORNELL- DUBILIER PART No. | ELMENCOPART No. | MALLORY PART No. | SPRAGUE PART No. |
| C37 | .22 200V | | DBE4P22 | | DMF4P22 | 4DP-5-224 | PVC4022 | 4PS-P22 |
| C38 | 470 1KV 10% | | DI-470 | DD-471 | BYZ601ZU471P | CCD-471 | GP347 | 5GA-T47 |
| C39 | .022 400V | | DBE4S22 | | DMF4S22 | 4DP-2-223 | PVC6122 | 4PS-S22 |
| C40 | .0039 1KV 10% | | BE10D39 | | | | | 10PS-D40 |
| C41 | .001 1KV 10% | | DI-1000 | DD-102 | BYZ601ZU102M | CCD-102 | GP210 | 5GA-D10 |
| C42 | .033 600V | | DBE6S33 | | DMF6S33 | 6DP-2-333 | PVC6133 | 6PS-S33 |
| C43 | .047 400V | | DBE4S47 | | DMF4S47 | 4DP-3-473 | PVC4147 | 4PS-S47 |
| C44 | .0047 | | DI-4700 | DD-472 | JB7601YPM472K | CCD-472 | GP247 | 10TS-D47 |
| C45 | .022 400V | | DBE4S22 | | DMF4S22 | 4DP-2-223 | PVC6122 | 4PS-S22 |
| C46 | .01 1KV | | DI-10000 | DD6-103 | BYX601ZU103M | CCD-103 | GP110 | 5GA-S10 |
| C47 | 82 N1500 3KV 10% | (68) † | | | | * | 3DY482 | |
| C48 | .1 200V | | DBE2P1 | | DMF2P1 | 2DP-3-104 | PVC201 | 2PS-P10 |
| C49 | 330 N1500 10% | | DI-330 | DD-331 | JBZ601YP331K | CCD-331 | GP331 | 10TS-T33 |
| C50 | 220 10% | | DI-220 | DD-221 | JBZ601YP221K | CCD-221 | GP322 | 10TS-T22 |
| C51 | .01 1KV | | DI-10000 | DD6-103 | BYX601ZU103M | CCD-103 | GP110 | 5GA-S10 |
| C52 | .0039 10% | | | DD-392 | | CCD-392 | GP239 | 10TS-D39 |
| C53 | .22 200V | | DBE4P22 | | DMF4P22 | 4DP-5-224 | PVC4022 | 4PS-P22 |
| C54 | 27 N1500 1KV 10% | #929157 | | | | * | 2DY-427 | |
| C55 | 470 10% | | DI-470 | DD-471 | JBZ601YP471K | CCD-471 | GP347 | 10TS-T47 |
| C56 | .0039 500V 10% | | | DD-392 | | CCD-392 | GP239 | 10TS-D39 |
| C57 | .012 400V 10% | | DBE6S12 | | DPMS6S12 | 6DP-2-123 | PVC6112 | 6PS-S12 |
| C58 | .001 | | DI-1000 | DD-102 | JBZ601YP102K | CCD-102 | GP210 | 10TS-D10 |
| C59 | .0047 | | DI-4700 | DD-472 | JB7601YP472K | CCD-472 | GP247 | 10TS-D47 |
| C60 | 82 5KV 5% | | HVD-60-82 | DD60-820 | | | 6PS-Q82 | |
| C61 | .1 600V | | DBE6P1 | | DMF6P1 | 6DP-4-104 | PVC601 | 6PS-P10 |
| C62 | .1 600V | | DBE6P1 | | DMF6P1 | 6DP-4-104 | PVC601 | 6PS-P10 |
| C63 | .047 400V | | DBE4S47 | | DMF4S47 | 4DP-3-473 | PVC4147 | 4PS-S47 |
| C64 | .033 400V | | DBE4S33 | | DMF4S33 | 4DP-2-333 | PVC6133 | 4PS-S33 |
| C65 | .1 600V | | DBE6P1 | | DMF6P1 | 6DP-4-104 | PVC601 | 6PS-P10 |
| C66 | .001 | | DI-1000 | DD-102 | JBZ601YP102K | CCD-102 | GP210 | 10TS-D10 |
| C67 | .1 600V | | DBE6P1 | | DMF6P1 | 6DP-4-104 | PVC601 | 6PS-P10 |
| C68 | .047 400V | | DBE4S47 | | DMF4S47 | 4DP-3-473 | PVC4147 | 4PS-S47 |
| C69 | .001 | | DI-1000 | DD-102 | JBZ601YP102K | CCD-102 | GP210 | 10TS-D10 |
| C70 | .001 | | DI-1000 | DD-102 | JBZ601YP102K | CCD-102 | GP210 | 10TS-D10 |
| C71 | .001 | | DI-1000 | DD-102 | JBZ601YP102K | CCD-102 | GP210 | 10TS-D10 |
| C72 | .001 | | DI-1000 | DD-102 | JBZ601YP102K | CCD-102 | GP210 | 10TS-D10 |
| C73 | 470 | | CI-471 | | JBZ601YP102K | | 125M-T47 | |
| C74 | 470 | | CI-471 | | | | 125M-T47 | |

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

Emerson Part Number

† Alternate Value

CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

| ITEM No. | USE | RESISTANCE | REPLACEMENT DATA | | | | |
|---------------|--|--------------------------|---------------------|-------------------------|-------------------------------|---------------------------|---|
| | | | EMERSON PART No. | CENTRALAB PART No. | CLAROSTAT PART No. | CTS-IRC PART No. | MALLORY PART No. |
| R1 | Volume/Switch | 1meg | 390833 ③ | F2-1meg, SN200, KR-1 | A47-1meg-Z, RN-3 ①, SWE-12 | BU2, CF26, S86 ①, GC | UA16A, SN2000 ①, US41 or (RU16A, SL38, SN2000 ①, US41) |
| | Volume/Switch | 1meg | 390912 ④ | F2-1meg, SN100, KR-2 | A47-1meg-Z, RN-3 ①, SWE-20 | BU2, CF26, S86 ①, WF * | UA16A, SN1000 ①, US42 or (RU16A, SL38, SN1000 ①, US42) |
| R2 | Brightness | 500K | 390895 | F1-500K, FFS015 | NP-500K-S, UPC-B-015 | † QJ-2244 | FA55L, OS937A |
| R3 | Contrast | 30K, 15K Tap | 390894 | F51-30K, FFS101 | | † QJ-2243 | FA34T24, OS1062 |
| R4 | Vert. Hold | 1.5meg | 390896 | F1-1.5meg, FFS015 | NP-1.5meg-S, UPC-B-015 | † QJ-1604 | FA155L, OS937A |
| R5A B C | Vert. Linearity Vert. Size (Height) Picture Optimizer (AGC) | 500K 560K Stop 50K | 390766 | | | | |
| R6 | Width | 1500Ω, 2W | 390927 ⑤ | V-1500 ② | U39-1500 ② | P115R252A | MR2500T, MRS1250 |

† "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts: B11-133, P21-029 (Panel)

"SNAPTROL" Equivalent: BU5, CF16, None, SFS, None.

* "CONCENTRIKIT" Equivalent: K-6 Kit with Base Elements and Shafts: B20-121X, P21-103 (Panel)

"SNAPTROL" Equivalent: BU5, CF49T, None, SF7, None.

* "CONCENTRIKIT" Equivalent: K-15 Kit with Base Elements and Shafts: B11-138, P21-029 (Panel)

"SNAPTROL" Equivalent: BU4, CF18, None, SFS, None.

① File flat.

② Insulate control from chassis and solder original center terminal lead to metal case of control.

③ Part #390911 is used in Chassis 120853.

④ Alternate Part, used in Chassis 120852.

⑤ Not used in some versions.

* "SNAPTROL"

RESISTORS (Power and Special)

| ITEM No. | RATING | REPLACEMENT DATA | | | ITEM No. | RATING | REPLACEMENT DATA | | |
|------------|-------------------|--------------------|-------------------------|---------------------|----------|---------------|------------------|---------------------|---------------------|
| | | IRC PART No. | WORKMAN PART No. | EMERSON PART No. | | | IRC PART No. | WORKMAN PART No. | EMERSON PART No. |
| R39 R79 | 4700Ω 5W 5Ω 7W | PW5-4500 PW10-5 | 5W-SQ-4.7K 10W-SQ-10 | 397158 394216 | R81 | 8Ω 5W (7W) | PW5-7.5 | 5W-SQ-7.5 | 394284 |

COILS (RF-IF)

| ITEM No. | USE | REPLACEMENT DATA | | | | | |
|----------|------------------------------|---------------------|----------------------|-------------------|--------------------|---------------------|--|
| | | EMERSON PART No. | MEISSNER PART No. | MERIT PART No. | MILLER PART No. | WORKMAN PART No. | |
| L1 | 47.25MC Trap | 720452 | | | 7515-E | | |
| L2 | 1st Video IF | 720541 | | | | | |
| L3 | RF Choke (4.4uh) | 705040 | 19-1003 | BC-564 | 74F476AP | T858 | |
| L4 | 41.25MC Trap | 720317 | | | 7516-E | WT273 | |
| L5 | 2nd Video IF | 720540 | | | 7514-E | | |
| L6 | 3rd Video IF | 720540 | | | 7514-E | | |
| L7 | 4th Video IF | 720455 | | | 7514-E | TA248 | |
| L8 | RF Choke (4.4uh) | 705040 | 19-1003 | BC-564 | 74F476AP | T858 | |
| L9 | RF Choke (1.6uh) | 705041 | 19-1001 | BC-562 | 74F156AP | T856 | |
| L10 | Peaking (90uh) | 708406 | 19-3093 | BC-669 | 6177 | T340 | |
| L11 | Peaking (530uh) | 708404 | 19-2029 | BC-678 | 6144 | T354 | |
| L12 | Peaking (530uh) | 708418 ① | 19-2029 * | BC-678 * | 6144 * | T354 * | |
| L13 | Sound Takeoff/ 4.5MC Trap | 720512 | | | | | |
| L14 | Peaking (180uh) | 708401 | | | | | |
| L15 | Sound Interstage | 720513 | 19-3180 | BC-672 | 6180 | T344 | |
| L16 | Quadrature | 720404 | | | 7138 | | |
| L17 | RF Choke (8.2uh) | 705058 | 20-1054 | TV-234 | 7137 | T269 | |
| L18 | RF Choke (8.2uh) | 705058 | 19-1009 | BC-566 | 74F826AP | T822 | |
| L19 | Filament Choke (18 turns) | 705031 | 19-1009 | BC-566 | 74F826AP | T822 | |
| L20 | Filament Choke (18 turns) | 705031 | | | | | |
| L21 | Filament Choke (18 turns) | 705031 | | | | | |

① Wound on 10K resistor.

* Shunt with 10K resistor.

COILS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA | | | | | | |
|----------|-----------------------------|---------------------|-------------------|--------------------|---------------------|------------------------|-------------------|---------------------|
| | | EMERSON PART No. | MERIT PART No. | MILLER PART No. | STANCOR PART No. | THORDARSON PART No. | TRIAD PART No. | WORKMAN PART No. |
| L22 | Horiz. Oscillator (Hold) | (E)716151 | | H-111 | | | | |

FILTER CHOKE

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | | | NOTES |
|----------|-----------------------|---------|------------------------------------|---------------------|-------------------|---------------------|------------------------|-------------------|-------|
| | CURRENT (Measured) | DC RES. | INDUCTANCE (0 CURRENT 1000~) | EMERSON PART No. | MERIT PART No. | STANCOR PART No. | THORDARSON PART No. | TRIAD PART No. | |
| L23 | .44ADC | 22Ω | .33 H | 737058 | | | | | |

TRANSFORMER (POWER)

| ITEM No. | RATING | | | REPLACEMENT DATA | | | | | NOTES |
|----------|--|-------------------------|--------|----------------------|-------------------|---------------------|------------------------|-------------------|---|
| | PRI. | SEC. 1 | SEC. 2 | EMERSON PART No. | MERIT PART No. | STANCOR PART No. | THORDARSON PART No. | TRIAD PART No. | |
| T1 | 128VAC @ .44A DC, Tap @117VAC | 6.3VAC @ .120A AC | | 730142 ① 730136 ② | | | | | ① Used in Chassis 120855A/B. ② Used in Chassis 120852A/B, 120853A. |

* TRANSFORMERS (SWEEP CIRCUITS)

| ITEM No. | USE | REPLACEMENT DATA | | | | | NOTES |
|----------|--------------------------------------|---------------------|-------------------|---------------------|------------------------|-------------------|-------|
| | | EMERSON PART No. | MERIT PART No. | STANCOR PART No. | THORDARSON PART No. | TRIAD PART No. | |
| T2 | Vert. Output | 738193 | | VO-114 | 26S85 | | |
| T3 | Yoke (Horiz. 24.5mh) (Vert. 63mh) | 708481 | MDF-143 | DY-67AT | Y-105 ② | YT-103-1 | |
| T4 | Clamp Horiz. Output | 587195 738210 | | | | | |

① Use original damping network, if necessary.

② Remove Black lead from original yoke terminals #5 and #8 and connect to Y-105 terminals #5 and #8.

* COMPONENT CONNECTION DATA

| ORIGINAL REPLACEMENT | HV TRANSFORMER | | | | VERTICAL OUTPUT | | | | YOKE | | | | | | | | YOKE PLUG | | | | | | | |
|-------------------------|----------------------|--|--|--|----------------------|------|-------|--------|----------------------|---|---|---|---|---|---|---|------------------|--|--|--|--|--|--|--|
| | Original Connections | | | | Original Connections | | | | Original Connections | | | | | | | | TO YOKE TERMINAL | | | | | | | |
| | | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | |
| MERIT | | | | | | | | | 1 | 2 | 3 | 4 | 8 | 6 | 7 | 5 | | | | | | | | |
| STANCOR | | | | | Red | Blue | Green | Yellow | 2 | 1 | 7 | 6 | 8 | 4 | 3 | 5 | † | | | | | | | |
| THORDARSON | | | | | Red | Blue | Green | Yellow | 1 | 2 | 3 | 4 | 8 | 6 | 7 | 5 | | | | | | | | |
| TRIAD | | | | | | | | | 1 | 2 | 3 | 4 | 8 | 6 | 7 | 5 | | | | | | | | |

† Rotate Yoke 180° (with leads @ Top).

TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | IMPEDANCE | | REPLACEMENT DATA | | | | | NOTES |
|----------|-----------|------|---------------------|-------------------|---------------------|------------------------|-------------------|-------|
| | PRI. | SEC. | EMERSON PART No. | MERIT PART No. | STANCOR PART No. | THORDARSON PART No. | TRIAD PART No. | |
| T5 | 2555Ω | 3-4Ω | Part of SP1 | A-3025 | A-3332 | 24S53 | S-12X | |

SPEAKER

| ITEM No. | TYPE | REPLACEMENT DATA | | | NOTES |
|----------|-----------------|---------------------|--------------------|------------------|----------------------------|
| | | EMERSON PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | 4" x 6" PM 3-4Ω | 180330 ① | P4X6W3 | 46A1 | ① With Output Transformer. |

FUSE DEVICES

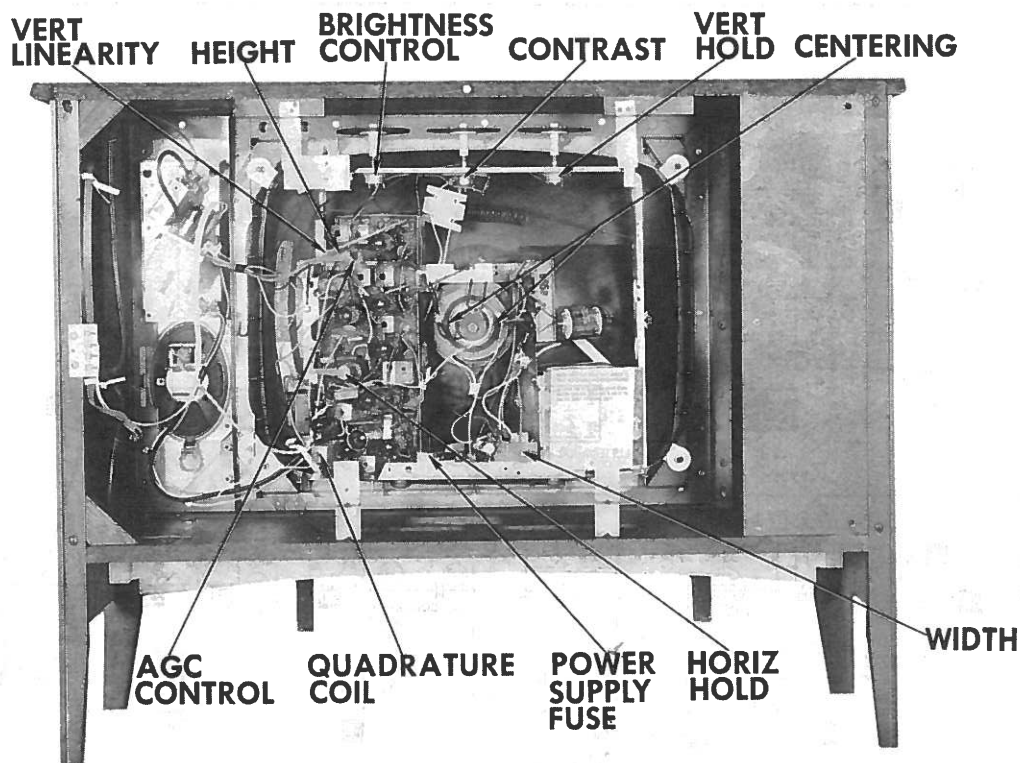
| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|----------|----------|----------|------------------|--------|------------------------|--------|------------------|--------|
| | | | PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| F1 | Chemical | 1.2 Amp. | 808236 | 808235 | 30301.2 | 357001 | MDL 1 2/10 | 4405 |

COMPONENT COMBINATIONS

| ITEM No. | USE | DESCRIPTION | EMERSON PART No. | REPLACEMENT DATA |
|----------|---------------------|---|---------------------|--------------------------------------|
| PC1 | Sync Take-Off | 470K, 2.2meg, 220pf, .01 | 923059 | Aerovox PA-782 |
| PC2 | Vertical Integrator | 8200Ω, 8200Ω, 22K, .002, .0047, .005, .005 | 923159 | Centralab PC-420 Centralab PC-503 |

MISCELLANEOUS

| ITEM No. | PART NAME | EMERSON PART No. | NOTES |
|----------|-------------|---------------------|-------|
| M1 | VHF Tuner | 471693 (ARS-209) | |
| M2 | VHF Tuner | 471689 | |
| | UHF Tuner | 471696A | |
| | UHF Tuner | 471695 | |
| | UHF Tuner | 471870 | |
| | UHF Tuner | 471874A | |
| | VHF Antenna | 471875A | J |



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune to a TV station and set all controls for normal operation. Adjust the Horizontal Hold control (Horizontal Oscillator coil) until the pic-

ture is in horizontal sync and cannot be disrupted when switching from channel to channel.

DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL

1. Remove 12 screws holding back cover and remove back cover. On some models it may be necessary to disconnect antenna leads. Remove all knobs.
2. Disconnect yoke plug, high voltage anode lead, picture tube socket, speaker leads, and ground wire.
3. Remove 4 screws holding chassis and 4 screws holding tuner and controls.

4. Lift out chassis and tuner.

NOTE: Most components may be serviced without removing chassis.

PICTURE TUBE REMOVAL

1. Follow "Chassis Removal" procedure. Lay set face down on a soft protective surface.
2. Remove 4 screws holding picture tube brackets and lift out picture tube. Do not lift out by the neck of the tube.