ADMIRAL TELEVISION

20C7 TELEVISION CHASSIS, AM or FM-AM RADIO and STEREO AMPLIFIER

TV CHASSIS STAMPED RUN 10

INSTALLATION and SERVICE NOTES

Etched Circuit Views, Schematic Diagram, List of Special Parts, Installation Adjustments Intended for Installation and Servicemen

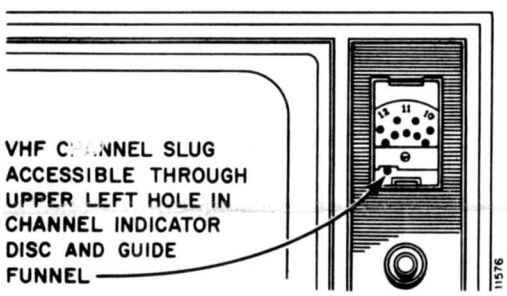
Make all checks or adjustments given here to insure best performance and ease in tuning. It is especially important that the VHF Channel Slugs be adjusted upon installation and at every service call. For complete service information, see Service Manual No. S869; for etched circuit service information, see Service Manual No. S559.

ADJUST VHF CHANNEL SLUGS

Check channel slug adjustment for each VHF station received. If adjustment is properly made, it is possible to tune from one VHF station to another by merely turning the Channel Selector knob. Adjust as follows:

a. Turn the set on and allow 15 minutes to warm up.

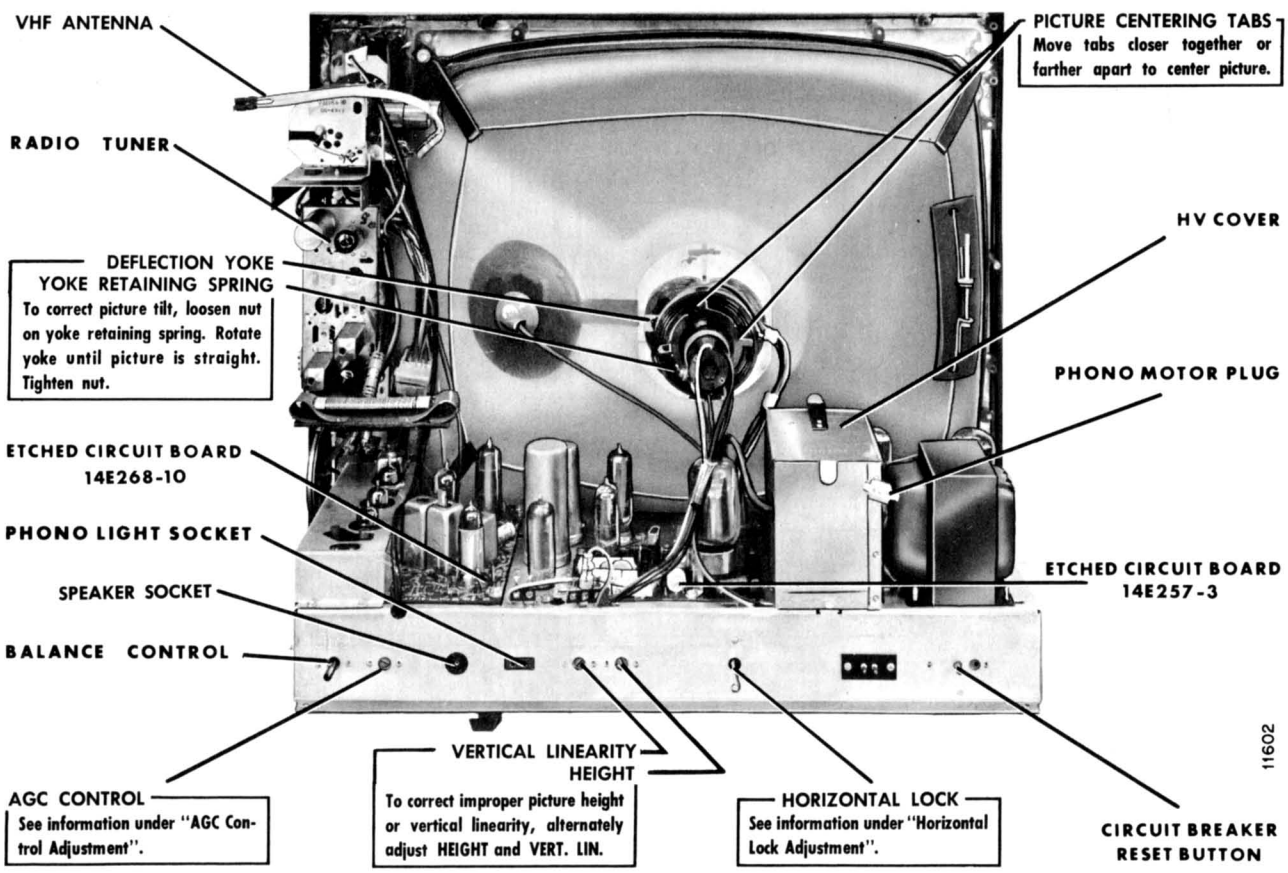
b. Set **VHF Channel Selector** for a station; set other controls for normal picture and sound.



c. Remove **VHF Channel Selector** knob. Remove snap-in escutcheon plate. To remove snap-in plate, insert blade end of a small screwdriver into groove at bottom of snap-in plate. With slight outward pressure, pull bottom of plate away from cabinet.

d. Turn Fine Tuning knob to the left or right until guide funnel (at front of tuner) is visible through upper left hole in channel indicator disc; see at left.

e. Carefully insert $\frac{3}{32}$" screwdriver blade, flexible non-metallic alignment tool (Part No. 98B30-22) through upper left hole in channel indicator disc and into guide funnel. With slight inward pressure, work alignment tool through hole in guide funnel, then into adjustment hole in the tuner. When alignment tool engages channel slug, carefully adjust slug for best picture. Note: It may be necessary to rotate fine tuning knob slightly to left or right while working alignment tool through hole in guide funnel and then into adjustment hole in tuner.



Rear View of Chassis Showing Adjustments.

AGC CONTROL ADJUSTMENT

The **AGC** control is an AGC threshold control which is used solely to adjust the receiver for optimum operation under all signal conditions. This control is set at the factory and will not normally require field readjustment.

Improper **AGC** control adjustment may result in an overloaded picture. Picture overload can be recognized by bending and/or tearing of the picture or buzz in the sound output. Also, loss of the picture or a weak washed-out picture can result from improper **AGC** adjustment. However, these same conditions can be caused by other troubles in the set.

If adjustment is required, it should be performed exactly as instructed below:

1. Turn set on and allow 15 minutes to warm up.
2. Select strongest station in the area.
3. Set **Contrast** control for normal picture and **Brightness** control to maximum (fully to right).
4. Set **AGC** control (at rear of chassis) to minimum (fully to left).
5. If picture has disappeared when **AGC** control is set to left, turn AGC to right until a weak picture is obtained. Adjust **Horizontal Lock** (rear of set) and **Vertical Hold** (front of set) for a steady picture without bending of vertical lines at top of picture.
6. Very slowly turn **AGC** control to right until picture just begins to bend, tear, shift or until buzz is heard in sound. Then, slowly turn **AGC** control to left to a point at which overload of picture and/or buzz in sound is removed. Turn **AGC** control an additional 10 degrees (approx.) to left.
7. Check picture at maximum contrast on all channels. Picture should not overload and should reappear immediately after changing channels.

IMPORTANT: AGC adjustment should always be made on the strongest TV station received. If adjustment is made only on a weak station, AGC overload may occur when a strong TV station is tuned in.

HORIZONTAL LOCK ADJUSTMENT

Make adjustment if picture "slips sideways" or "tears" when switching channels. Adjustment is made by rotating flexible shaft extending from rear of set. Adjust as follows:

1. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for normal picture. Important: Before proceeding, be sure that the AGC control has been adjusted according to instructions in this manual.
2. Reduce Contrast to minimum. Very slowly turn Horizontal Lock adjustment to the right or left until picture is in sync. Interrupt the television signal by switching Channel Selector off and on channel. Picture should remain in sync. If picture bends or loses sync, adjust the Horizontal Lock so that picture remains in sync and bending of vertical lines does not appear at top of picture. Check adjustment on all channels; if necessary, repeat procedure.

PICTURE TUBE HANDLING PRECAUTION

WARNING: Picture tube must be handled with care. ALWAYS lift picture tube by grasping firmly around face plate; NEVER LIFT TUBE BY ITS NECK. Use care when inserting socket to prevent bending pins. WHEN TUBE IS REMOVED, ALWAYS PLACE IT FACE DOWN.

REMOVING CHASSIS FROM CABINET

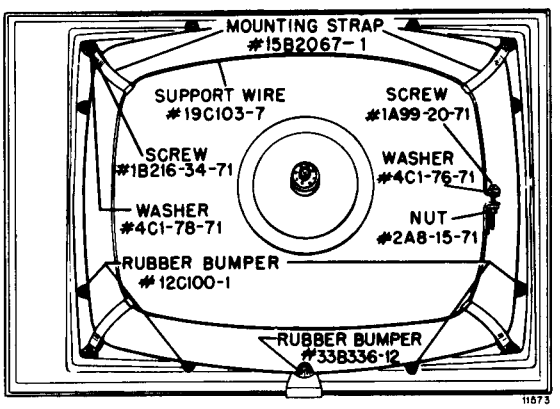
For servicing convenience, chassis including picture tube and front escutcheon are removable as a unit from in front of cabinet. Remove chassis as follows:

1. Remove cabinet back. Disconnect antenna and speaker.
2. Remove chassis mounting screws from bottom of cabinet.
3. From inside of cabinet, remove screws which mount front escutcheon to front of cabinet. Note: A 5/16" socket wrench with 20" long shank will be required for sets with metal cabinet.
4. Remove chassis from cabinet by securely grasping sides of front escutcheon.
5. To reinstall chassis in cabinet, very carefully guide chassis through front of cabinet. In metal cabinet models, the front edges of the cabinet must fit firmly into grooved surfaces of rear of metal escutcheon. In wood cabinet models, guide metal locating pins (at rear of escutcheon) into matching holes in cabinet.
6. After chassis and escutcheon are firmly seated in cabinet, reassemble screws mounting escutcheon to front of cabinet. Reassemble chassis mounting screws at bottom of cabinet. Reconnect antenna and speaker.

PICTURE TUBE REPLACEMENT

The picture tube of these receivers is mounted directly to the front escutcheon as shown in the figure below. To replace picture tube, proceed as follows:

1. Remove chassis, picture tube, yoke coil and front escutcheon as a unit from the front of the cabinet as instructed under "Removing Chassis From Cabinet".



Rear View of Escutcheon with Picture Tube Mounted, Chassis Removed.

2. Remove tuning knobs. Place chassis on a solid table with escutcheon face downward on a clean, soft cloth. Caution: To prevent damage to front tuning controls, place escutcheon on a table so that control shafts overhang edge of table.
3. Remove static charge from picture tube by discharging second anode well to chassis ground.
4. Disconnect yoke connector plug, picture tube socket, radio and phono plug, picture tube second anode lead and dial light from mounting bracket.
5. Disconnect brackets mounting VHF tuner and front panel controls by removing bracket mounting screws.
6. Remove screws from brackets at each side of chassis.

7. Remove screws which support inside center of chassis to bracket at bottom of picture tube.
8. After removing chassis mounting screws, securely grasp chassis and carefully remove it from mounting brackets.
9. Remove deflection yoke from picture tube after loosening clamping nut on band at rear of yoke cap.
10. To remove picture tube from front escutcheon, loosen retaining screw on tube support wire. Remove screws mounting tube support straps.
11. To mount replacement tube, place tube on front escutcheon with second anode well located on same side as original tube. Reassemble support wire and mounting straps removed in step 10.
12. Reassemble deflection yoke to neck of picture tube.
13. Mount chassis to escutcheon brackets by assembling mounting screws removed in steps 6 and 7.
14. Mount VHF tuner and tuning control support brackets to escutcheon.
15. Connect deflection yoke plug, picture tube socket and second anode lead. Reassemble pilot light socket.
16. Turn receiver on and make picture adjustments as instructed in figure on front page. Important: After making picture adjustments, be sure to tighten nut on clamping band at rear of yoke cap. Readjust indexing of channel indicator disc by rotating disc.
17. To reinstall chassis in cabinet, see steps 5 and 6 under "Removing Chassis From Cabinet."

INDEXING CHANNEL INDICATOR DISC

To index channel indicator disc for proper channel indication, remove snap-in escutcheon plate. To remove snap-in plate, insert blade end of a small screwdriver into groove at bottom of snap-in plate. With slight outward pressure, pull bottom of plate away from cabinet.

Parts List

Only special parts are listed below. See Service Manual No. S869 for complete list.

RESISTORS

Sym.	Description	Part No.
R240	5 megohms, Balance control	75B 20-134
R243	1 megohm, ½ watt, 5%	60B 7-105
R244	1 megohm, ½ watt, 5%	60B 7-105
R245	200 ohms, 5 watt	61B 1-37
R247	150 ohms, 2 watt	60B 20-151
R301	15,000 ohms, ½ watt, 5%	60C 28-153
R302	12,000 ohms, ½ watt, 5%	60B 7-123
R321	47,000 ohms, 1 watt	60B 14-473
R323	5,600 ohms, 7 watts	61B 24-743
R327	100,000 ohms, Brightness	75D 13-110
R330	25,000 ohms, Contrast	75D 20-126
R401	8,200 ohms, 5 watts	61D 24-447
R403	100,000 ohms, AGC control	75D 20-118
R405	3 megohms, ½ watt, 5%	60B 7-305
R412	8,200 ohms, 1 watt	60B 14-822
R427	500 ohms, Vertical Linearity	75D 20-100
R428	180 ohms, 1 watt	60B 14-822
R429	200,000 ohms, Vertical Hold	75D 13-109
R430	1.5 megohms, Height control	75D 20-104
R431	470 ohms, 3 watts (wirewound)	61A 1-45
R433	39,000 ohms, 1 watt	60B 14-393
R439	6,800 ohms, 1 watt	60B 14-682
R442	5,600 ohms, 1 watt	60B 14-562
R445	22,000 ohms, 3 watts	61B 24-357
R450	1,200 ohms, ½ watt, 5%	60B 7-122
R451	47,000 ohms, ½ watt, 5%	60B 7-473
R453	15,000 ohms, ½ watt, 5%	60B 7-153
R460	12,000 ohms, 3 watts	61C 24-351
R461	1.5 ohms, ½ watt	61A 28-60
R464	3.8 ohms, (cold resistance) thermistor	61A 27

CAPACITORS

Sym.	Description	Part No.
C201	1,000 mmf, 500 volts, 10%, cer. disc, NPO temp. coeff.	65D 10-53
C202	4.5 mmf, 450 volts, 5%, composition	60B 40-57
C203	82 mmf, 500 volts, 5%, cer. NPO temp. coeff	65D 10-98
C204	.0015 mf, 500 volts, cer. disc.	65D 10-103
C205	.0047 mf, 500 volts, cer. disc.	65D 10-112
C206	120 mmf, 500 volts, ceramic.	65D 10-211
C207	18 mmf, 500 volts, 5%, cer., N220 temp. coeff	65D 10-140
C208	.01 mf, 600 volts, cer. disc.	65D 10-41
C209	.047 mf, 500 volts, cer. disc.	65D 10-112
C217A	60 mf, 200 volts	
C217B	5 mf, 200 volts } electrolytic.	67D 15-347
C217C	50 mf, 50 volts	
C220	10 mf, 400 volts, electrolytic.	See C502C
C242	.001mf, 2 KV, ceramic	65D 10-181
C243	40 mf, 200 volts, electrolytic.	67B 4-21
C245	50 mf, 15 volts, electrolytic.	67B 47-3
C246	.001mf, 2 KV, ceramic	65D 10-181
C300	39 mmf, 500 volts, 5%, cer.	65D 10-120
C301	3 to 13 mmf, cer. trimmer, N220 temp. coeff	66A 38-7
C302	32 mmf, 500 volts, 2%, cer. disc, NPO temp. coeff.	65D 6-157

CAPACITORS (Cont.)

Sym.	Description	Part No.
C303	3 to 17 mmf, cer. trimmer, NPO temp. coeff	66A 38-11
C304	20 mmf, 500 volts, 2%, cer. disc, NPO temp. coeff.	65D 6-143
C305	820 mmf, 500 volts, cer. disc	65D 10-91
C306	820 mmf, 500 volts, cer. disc.	65D 10-91
C307	47 mmf, 500 volts, cer. disc.	65D 10-80
C308	820 mmf, 500 volts, cer. disc	65D 10-91
C309	820 mmf, 500 volts, cer. disc	65D 10-91
C310	.0022 mf, 500 volts, cer. disc	65D 10-11
C311	.005 mf, 450 volts, cer. disc	65D 10-5
C312	560 mmf, 500 volts, 5%, cer.	65D 6-131
C313	820 mmf, 500 volts, cer. disc	65D 10-91
C314	3.3 mmf, 5%, cer. NPO temp. coeff	65D 6-89
C315	6.8 mmf, 500 volts, 10%, comp	65B 41-141
C316	47 mmf, 500 volts, 5%, cer. disc	65D 10-92
C317	4.7 mmf, 500 volts, 10%, comp	65B 28-138
C318	47 mmf, 500 volts, 5%, cer. disc	65D 10-92
C319	.02 mf, 500 volts, cer.	65D 10-137
C320	.005 mf, 500 volts, cer. disc.	65D 10-5
C321	5 mf, 200 volts, electrolytic.	See C217B
C322	20 mmf, 500 volts, cer. NPO temp. coeff	65D 10-123
C323	.22 mf, 400 volts, paper.	64C 25-30
C324	9 mmf, 500 volts, 2%, cer.	65D 6-155
C325	820 mmf, 500 volts, cer. disc	65D 10-91
C326	820 mmf, 500 volts, cer. disc	65D 10-91
C327	820 mmf, 500 volts, cer. disc	65D 10-91
C328	820 mmf, 500 volts, cer. disc	65D 10-91
C329	820 mmf, 500 volts, cer. disc	65D 10-91
C400	1 mf, 100 volts, paper	64A 10-3
C401	.22 mf, 200 volts, paper.	64C 25-55
C402	.01 mf, 500 volts, cer. disc.	65D 10-3
C403	.001 mf, 500 volts, cer.	65D 10-153
C405	.001 mf, 2,000 volts, cer.	65D 10-181
C406	.0047 mf, 500 volts, cer.	65D 10-112
C407	.0047 mf, 500 volts, cer.	65D 10-112
C408	.01 mf, 600 volts, cer.	65D 10-41
C409	.0022 mf, 500 volts, cer.	65D 10-111
C410	.001 mf, 2 KV, cer.	65D 10-181
C411	.082 mf, 200 volts	64B 2-55
C412	.033 mf, 1 KV, 10%, paper.	64B 2-53
C413	.1 mf, 400 volts, paper.	64B 8-26
C414	.1 mf, 400 volts, 10%, paper	64C 26-32
C415	.001 mf, 2 KV, cer.	65D 10-181
C416	50 mf, 50 volts, electrolytic.	See C217C
C417	.047 mf, 600 volts, paper.	64B 8-9
C418	50 mf, 350 volts, electrolytic.	67D 15-226
C419	.022 mf, 600 volts, 10%, paper	64C 2-45
C420	.047 mf, 1 KV, paper.	64B 2-30
C423	.001 mf, 500 volts, 10%, cer.	65D 10-184
C424	.001 mf, 500 volts, 10%, cer.	65D 10-184
C425	.01 mf, 400 volts, paper.	64B 8-32
C426	.0047 mf, 500 volts, cer.	65D 10-112
C427	.047 mf, 600 volts, paper.	64B 8-9
C428	.0039 mf, 500 volts, 10%, mica	65B 2-392

CAPACITORS (Cont.)

Sym.	Description	Part No.
C429	820 mmf, 500 volts, cer. disc	65D 10-91
C431	.0047 mf, 500 volts, cer.	65D 10-112
C432	.047 mf, 600 volts, paper.	64B 8-9
C433	.047 mf, 1 KV, paper.	64B 2-30
C434	.047 mf, 600 volts, paper.	64B 8-9
C435	.02 mf, 1.6 KV, 5%, paper.	64C 2-64
C437	47 mmf, 4 KV, cer.	65D 10-225
C502A	40 mf, 400 volts	
C502B	100 mf, 400 volts } electrolytic.	67D 15.346
C502C	10 mf, 400 volts	

COILS AND TRANSFORMERS

Sym.	Description	Part No.
L201A L201B	Phase Shift and Sound Coil	72C 208-1
L202	Quadrature Coil	72C 132-37
L301	41.25 MC Trap Coil	73B 37-4
L302	43.50 MC Trap Coil	72C 132-43
L303	39.75 MC Trap Coil	73B 37-5
L304	RF Choke Coil	73B 31-4
L305	Video Peaking Coil	73B 31-3
L306	Video Peaking Coil (wound on R317)	73C 5-41
L307	Video Peaking Coil	73C 5-20
L310	Heater Choke	73B 37-2
L311	IF Coupling Coil	73B 37-6
L312	47.25 MC Trap Coil	72C 132-44
L401	Horizontal Lock Coil	94D 17-7
L501	Filter Choke	74B 18-38
T241	Sound Output Transformer	79D 33-32
T242	Sound Output Transformer	79D 33-33
T301	1st IF Transformer	72C 132-39
T302	2nd IF Transformer	72C 132-39
T303	3rd IF Transformer (includes C314, C315 and CR301)	72B 191-3
T304	Sound Take-off Transformer (includes C307, C316, C317 & C318.	72C 185-2
T401	Vertical Output Transformer.	79B 43-20
T402	Deflection Yoke	94D 187-2C
T403	Horizontal Output Trans.	79E 77-9
T501	Power Transformer	80D 65-1

MISCELLANEOUS CHASSIS PARTS

Sym.	Description	Part No.
CR301	Video Detector (Order same part number as original)	1N87 or 1N87A
CR401	Diode, Dual Selenium	93B 5-4
M515	Interlock Socket and Line Cord	89B 62-8
M516	Interlock Plug	88A 36
M503	Fuse Wire, 1" length of 36 ga. annealed copper wire.	Obtained Locally
M505	Circuit Breaker	84A 17-2
S501	Switch, On-Off Power	Part of R208
Picture Centering Device		94C 152-1

SERVICING RADIO TUNER

The AM or FM-AM radio tuner is a sub-chassis mounted separate from the television chassis. Since the radio sub-chassis utilizes the power supply of the television chassis, it cannot be operated without connection to the television chassis. However, for servicing convenience, radio connector cables have been made extra long, so that the radio may be removed from cabinet and operated on the service bench.

To remove radio sub-chassis for servicing, disconnect power supply, phono and audio connector plugs. Unloosen pilot light socket from television chassis. Remove radio tuning knobs and mounting screws which mount radio sub-chassis to front escutcheon. Important: Before disconnecting connector plugs, note original connections to avoid error when reconnecting .

CIRCUIT BREAKER

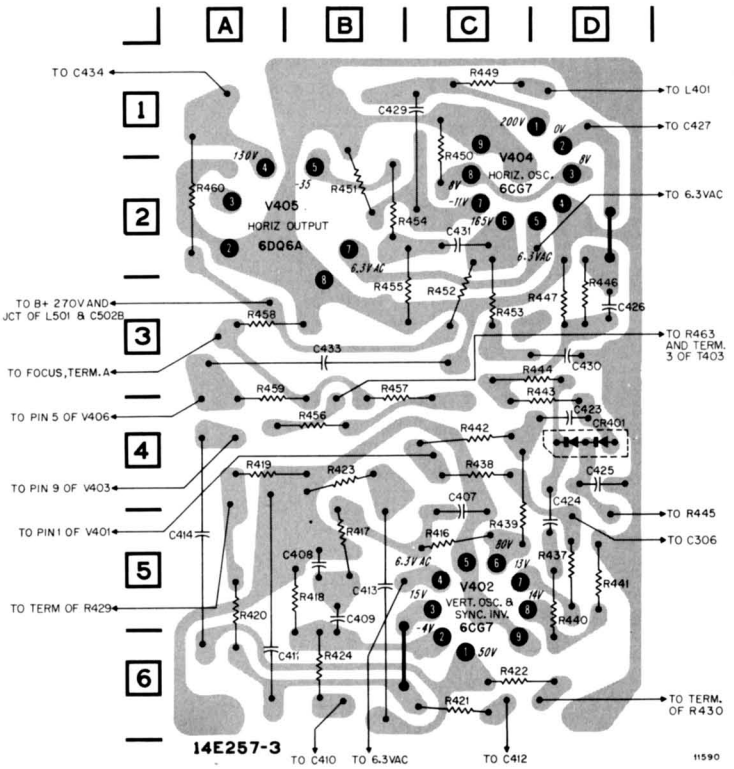
For protection against overload, the B+ power supply of this receiver is equipped with a thermal type circuit breaker having a manual reset button.

Since the overload mechanism is of the thermal type, a few minutes should be allowed for it to cool off before pressing the reset button.

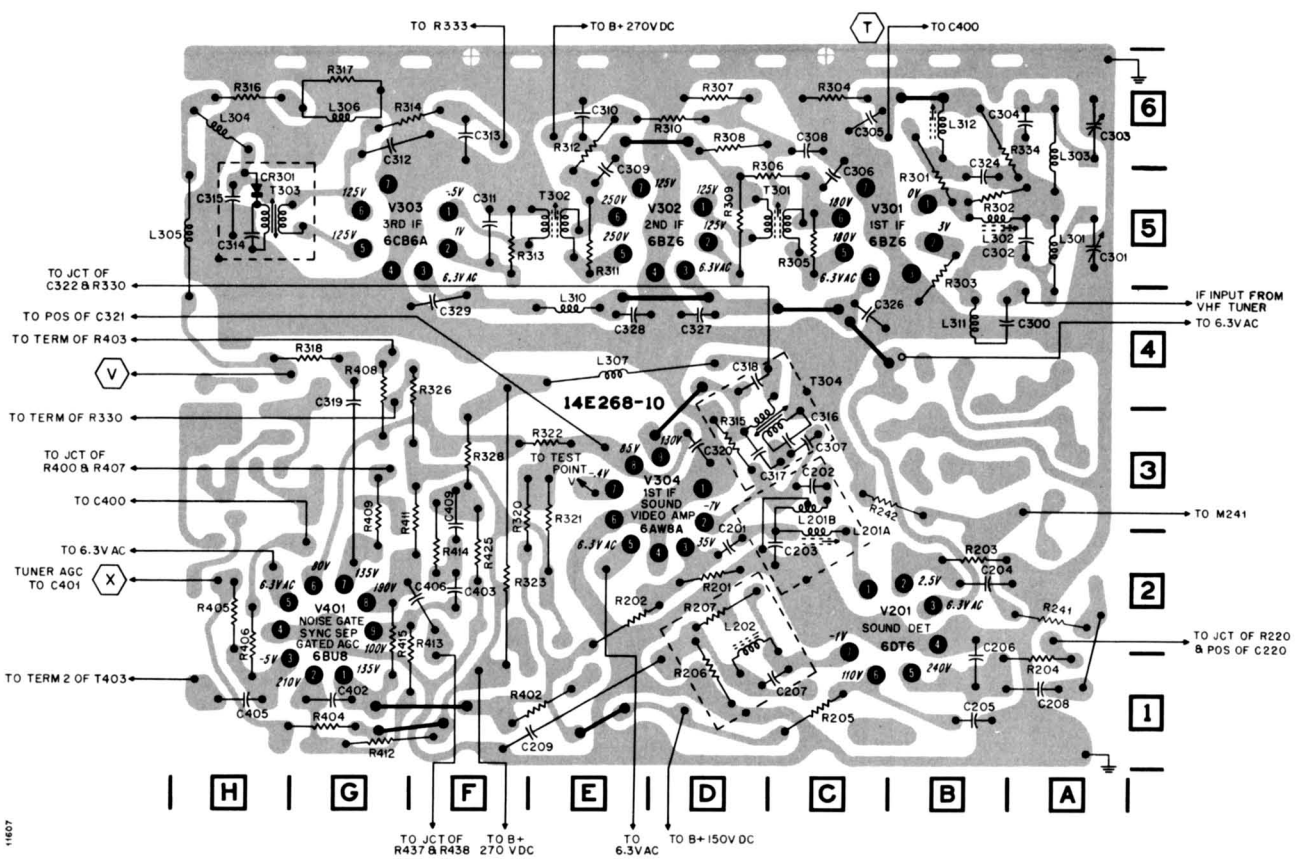
If the overload relay continues to open up after pressing the reset button several times, check for a faulty tube or shorted component in the B+ circuit. Especially check rectifier tube V501 (5U4GB).

ETCHED WIRING VIEWS

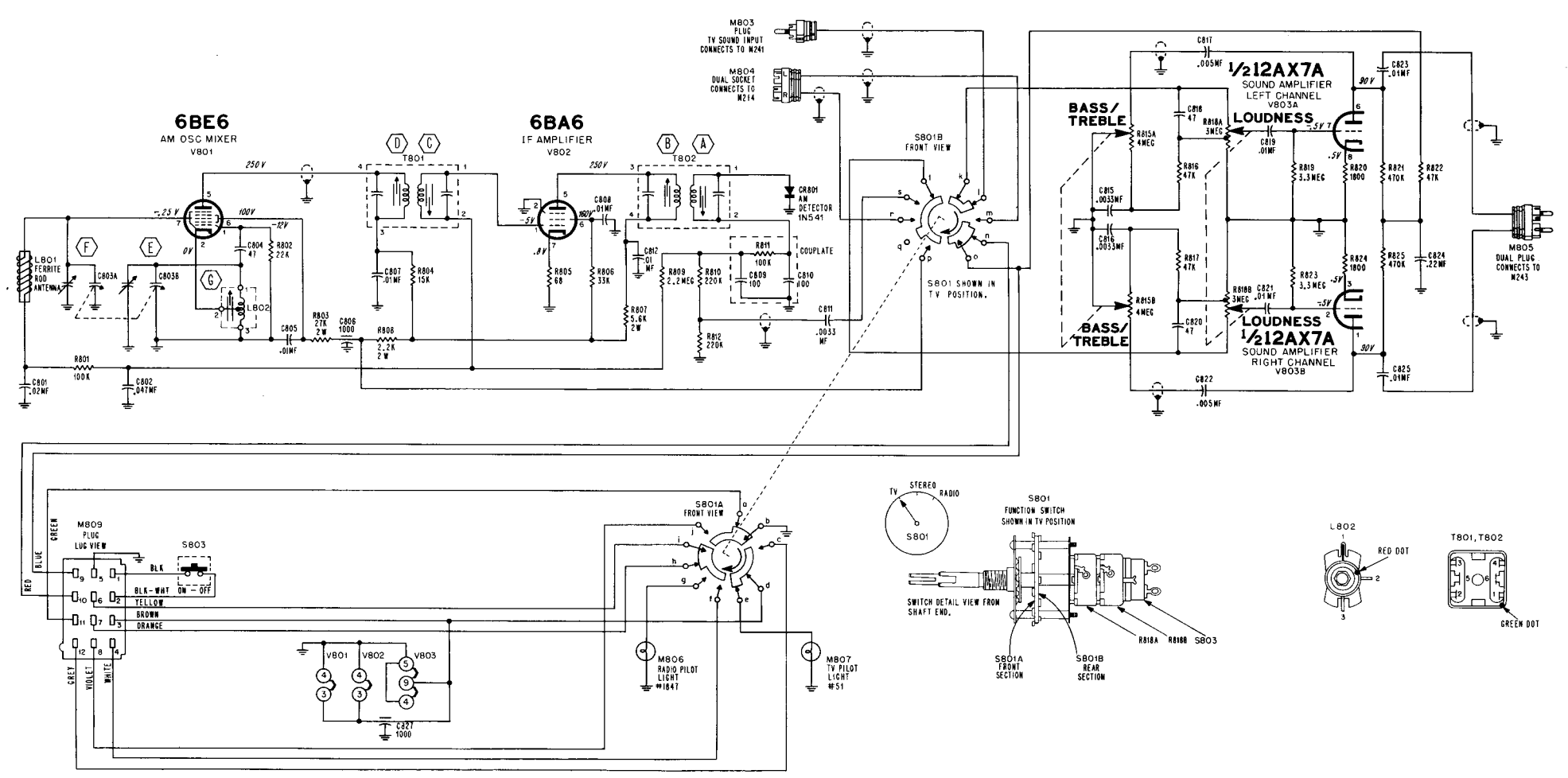
For complete etched circuit service information, see Service Manual No. S559.



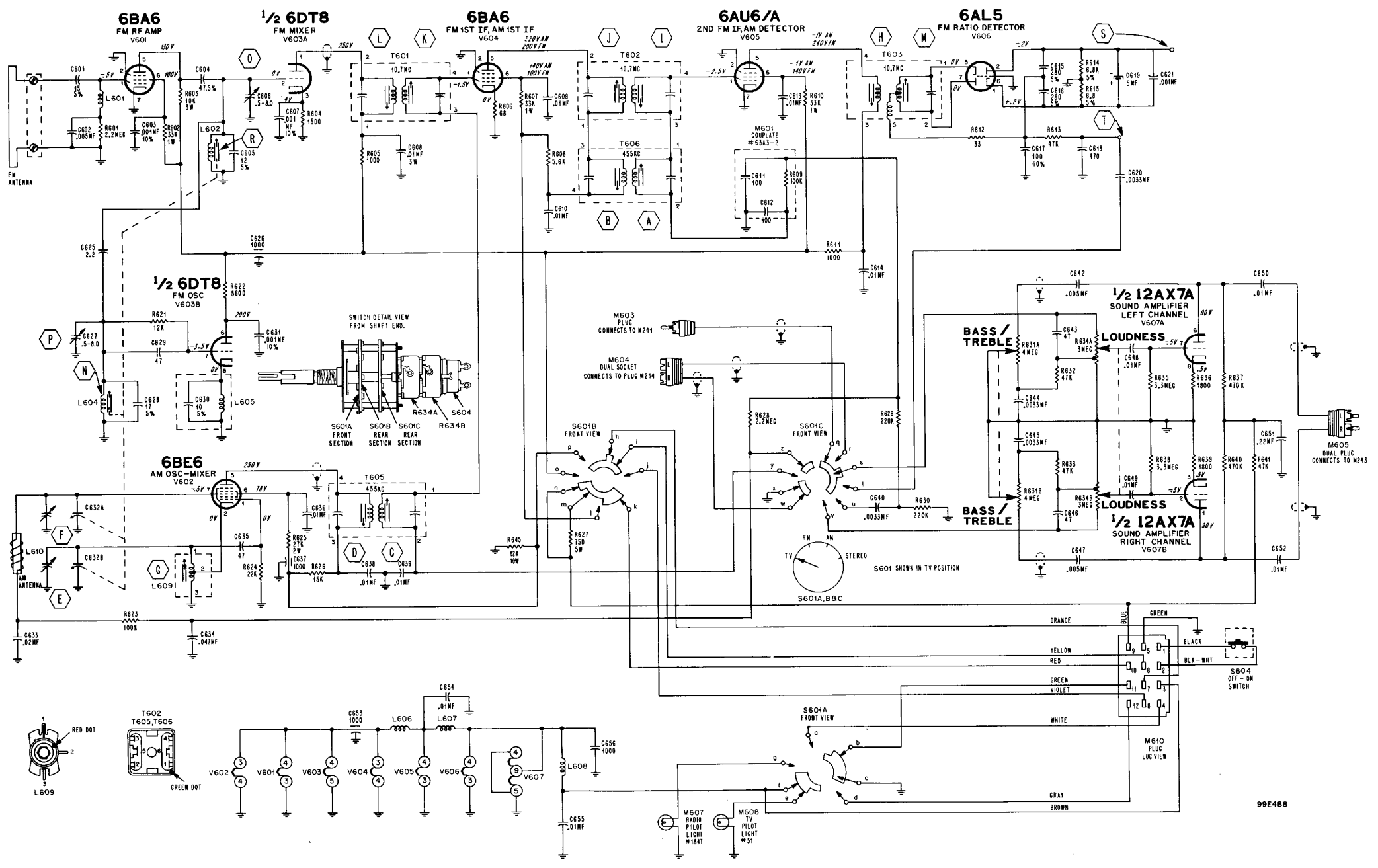
View of ETCHED SIDE of Etched Circuit Board 14E257-3.



View of ETCHED SIDE of Etched Circuit Board 14E268-10. Gray area represents etched circuitry; black symbols and lines represent components and connections on opposite side.



Schematic for 3V1 AM Radio



Schematic for 7X1 FM-AM Radio

TELEVISION TUBE COMPLEMENT

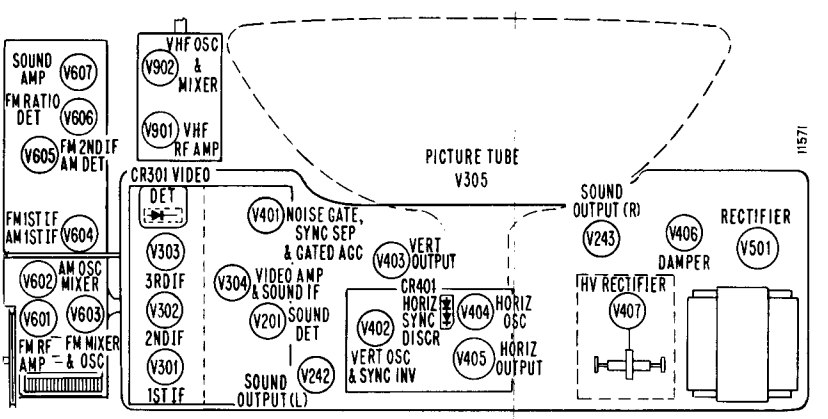
V901—6ER5
V902—6CG8 or 6CG8A
V201—6DT6
V242—EL86/6CW5
V243—EL86/6CW5
V301—6BZ6
V302—6BZ6
V303—6CB6A
CR301—1N87 or 1N87A (Crystal Diode)
V304—6AW8A
V305—23CP4, 23GP4 or 23HP4
V401—6BU8
CR401—93B5-4
V402—6CG7
V403—6EM5
V404—6CG7
V405—6DQ6A
V406—6AU4GTA or 6DE4
V407—1G3GT
V501—5U4GB

FM-AM RADIO TUBE COMPLEMENT

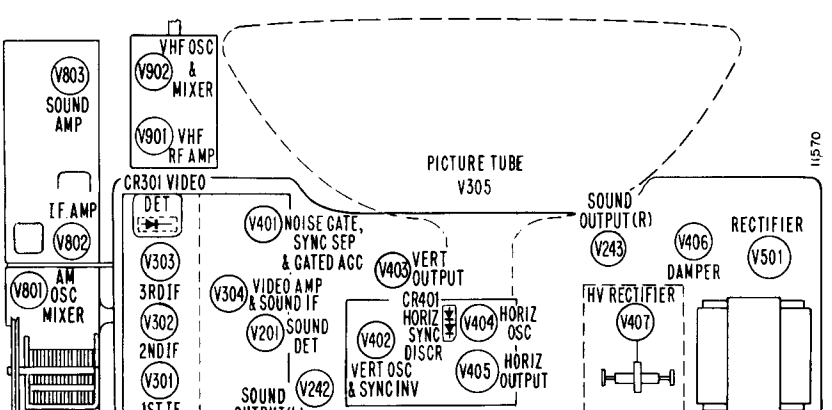
V601—6BA6
V602—6BE6
V603—6DT6
V604—6BA6
V605—6AU6A
V606—6AL5
V607—12AX7

AM RADIO TUBE COMPLEMENT

L801—6BE6
L802—6BA6
L803—12AX7



Tube Locations for Sets With 7X1 FM-AM Radio.



Tube Locations for Sets With 3V1 AM Radio.

VOLTAGES AND WAVEFORMS

- Line Voltage: 117 volts AC.
- Set Channel Selector on an unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb AGC and Horizontal Lock adjustments.
- Antenna disconnected and terminals shorted together.
- DC voltages measured with VTVM between tube socket terminals and chassis, unless otherwise indicated.
- Voltages marked (*) will vary widely with control settings.
- Waveforms taken with transmitted signal input to television chassis.
- For waveform measurement, all controls set for normal picture.
- Peak-to-peak voltages may vary slightly from those shown.

SCHEMATIC NOTES

Numbers and letters inside hexagons indicate alignment points.

Fixed resistor values shown in ohms ± 10% tolerance, ½ watt; capacitor values shown in micromicrofarads ± 20% unless otherwise specified.

NOTE: K = x 1000, MEG = x 1,000,000, MF = microfarad.

B+ Circuit Breaker: B+ supply of this receiver is equipped with a thermal type circuit breaker having a manual reset button. Allow a few minutes for circuit breaker to cool off before pressing the reset button.

Heater Fuse: A one inch length of number 26 gauge bare annealed copper wire is used. Fuse wire is located at underside of chassis.

Warning: Pulsed high voltages are present at caps of V405 and V407, and pin 3 of V406. Use suitable test equipment at these points.

Schematic for 20C7 Television Chassis with Dual Channel (Stereo) Amplifier Stamped Run 10