Admiral

Models Using 21 MC IF Chassis
21A3Z, 21A3AZ, 21C3Z and 21G3Z

Models Using 41 MC IF Chassis
21B3Z, 21D3Z and 21H3Z

DIFFERENCES BETWEEN CHASSIS

The 21A3Z chassis is a VHF television only receiver with a 21 MC. IF system.

The 21A3AZ chassis is the same as the 21A3Z chassis, except that power supply filter choke and the output transformer are mounted on the chassis and not on the speaker.

The 21B3Z chassis differs from the 21A3Z chassis in that it is a VHF-UHF television only receiver with a 41 MC. IF system.

The 21C3Z chassis is used in VHF-TV-Radio-Phonograph combination models. It is similar to the 21A3Z chassis, except that it is equipped to have a 3D1A Radio Record Changer unit connected to it.

The 21D3Z chassis is used in VHF-UHF TV-Radio-Phonograph combination models. It is similar to the 21B3Z chassis, except that it is equipped to have a 3D1A Radio-Record Changer unit connected to it.

The 21G3Z chassis is similar to the 21A3Z chassis, but is designed for a 27RP4 picture tube.

The 21H3Z chassis is similar to the 21B3Z chassis, but is designed for a 27RP4 picture tube.

Use the circuit of 21A3Z, pages 16-17, when servicing 21A3Z, 21A3AZ, 21C3Z, and 21G3Z chassis.

Use the circuit of 21D3Z (combination) on pages 20-21 when servicing 21B3Z, 21D3Z, 21H3Z. This material includes the circuit of 3D1A radio.

ADJUST THE ION TRAP

To prolong the life of the picture tube, it is important that this adjustment be made upon installation, after centering the picture, or after repositioning the focus assembly.

Set the **Brightness** control for normal brightness.

Position the ion trap on the picture tube close to the tube base. Very carefully move the ion trap forward or backward and at the same time, rotate it slightly in either direction until maximum brightness is produced.

Note that there may be two locations where the brightest picture can be produced. The second ion trap location, which is farther from the tube base, should not be used or tube damage will result.

Reset the **Brightness** control for normal brightness. Readjust the ion trap for maximum brightness.

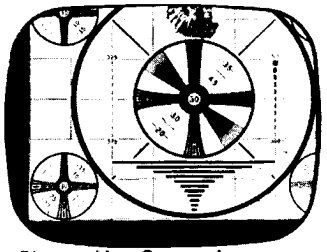
Important: If the corners of the picture are shaded, be sure the ion trap has been properly adjusted for maximum brightness. Do not reduce picture brightness to remove shaded corners.

MODEL IDENTIFICATION CHART

MODEL No.	MODEL NAME	TV CHASSIS	VHF TUNER
T2311Z	Coral Gables	21A3Z	94D61-2
TA2311Z	Coral Gables	21B3Z	94D64-4
T2312Z	Bel-Aire	21A3Z	94D61-2
TA2312Z	Bel-Aire	21B3Z	94D64-4
T2316Z	Beverly Hills	21A3Z	94D61-2
TA2316Z	Beverly Hills	21B3Z	94D64-4
T2317Z	Bermuda	21A3Z	94D61-2
TA2317Z	Bermuda	21B3Z	94D64-4
T2318Z	Bar Harbor	21A3Z	94D61-2
TA2318Z	Bar Harbor	21B3Z	94D64-4
T2319Z	Park Avenue	21A3Z	94D61-2
C2316Z	Catalina	21A3Z	94D61-2
CA2316Z	Catalina	21B3Z	94D64-4
C2317Z	Casablanca	21A3Z	94D61-2
CA2317Z	Casablanca	21B3Z	94D64-4
C2319Z	Santa Barbara	21A3Z	94D61-2
C2326Z	Del-Monte	21A3Z 21A3AZ	94D61-2
CA2326Z	Del-Monte	21B3Z	94D64-4
C2327Z	California	21A3Z 21A3AZ	94D61-2
CA2327Z	California	21B3Z	94D64-4
C2826Z	Trinidad	21G3Z	94D61-3
CA2826Z	Trinidad	21H3Z	94D64-4
C2827Z	Hollywood	21G3Z	94D61-3
CA2827Z	Hollywood	21H3Z	94D64-4
F2326Z	El Dorado	21A3Z 21A3AZ	94D61-2
FA2326Z	El Dorado	21B3Z	94D64-4
F2327Z	Riviera	21A3Z 21A3AZ	94D61-2
FA2327Z	Riviera	21B3Z	94D64-4
F2328Z	Deauville	21A3Z 21A3AZ	94D61-2
FA2328Z	Deauville	21B3Z	94D64-4
L2326Z	Westchester	21C3Z	94D61-2
LA2326Z	Westchester	21D3Z	94D64-4
L2327Z	Westwood	21C3Z	94D61-2
LA2327Z	Westwood	21D3Z	94D64-4

ADJUST PICTURE CENTERING

The picture can usually be centered with the picture positioning lever. Loosen screw "A". Move the lever sideways or up and down until the picture is centered. Tighten screw "A".



Picture Not Centered

ADMIRAL (Continued)

HORIZONTAL DRIVE ADJUSTMENT

If the **Horiz. Drive** adjustment (on rear of set) is not properly adjusted, it may be difficult to obtain sufficient picture width and brightness.

NOTE: In early sets, a shaft extending from the rear of the chassis can be rotated for making the horizontal drive adjustment as shown in figure 8. In late sets, adjustment is made by turning the trimmer screw which replaces the shaft (see figure 7).

a. Turn the **Horiz. Drive** control (or trimmer screw) fully clockwise.

   If a white vertical line appears on the screen, slowly turn **Horiz. Drive** control (or trimmer screw) counterclockwise until the line disappears.

b. Check **Horizontal** control (on front panel) to see that its range is proper after making the **Horiz. Drive** adjustment.

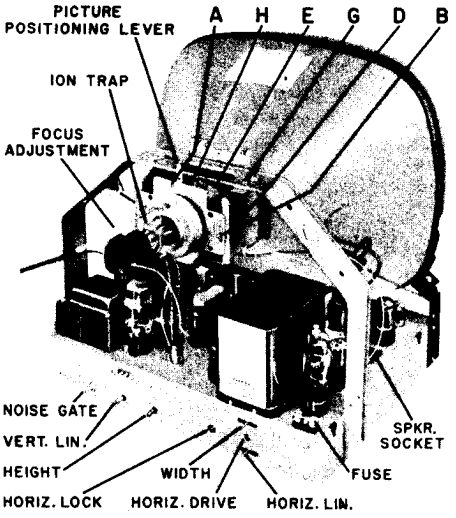


Figure 7. Rear View of 21A3Z, 21A3AZ, and 21B3Z Chassis, Showing Adjustment Locations.

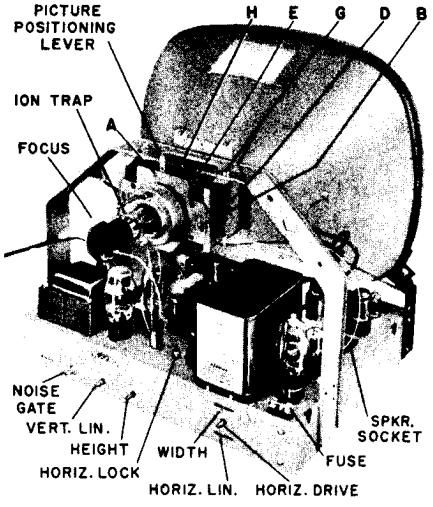
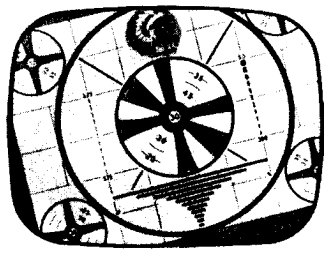


Figure 8. Rear View of 21A3Z and 21B3Z Chassis, Stamped Run 11 or Lower, Showing Adjustment Locations.

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

ADJUST PICTURE TILT

In early production models: If the picture is tilted, loosen the wing screw "H" on the deflection yoke "E" and slightly rotate the yoke until the picture is straight. Before tightening the wing screw, be sure that the yoke is moved as far forward as possible, otherwise corners of the picture may become shaded.



Picture Tilted; Adjust Deflection Yoke.

In late production models: If the picture is tilted, hold the yoke retaining plate stationary with one hand and slightly rotate the yoke with the other hand until the picture is straight.

HORIZONTAL OSCILLATOR ADJUSTMENT

In early production chassis the **Horizontal Lock** adjustment was located on the rear apron of the chassis (see figure 7). In later production chassis this adjustment was located at the top-rear of the chassis (see figure 8). In latest production chassis this adjustment is again on the rear apron of the chassis as in figure 7.

When switching channels, the **Horizontal** control (on front panel) should keep the picture in horizontal sync through at least three fourths of its range. If the picture does not remain in horizontal sync, it will be necessary to make the **Horiz. Lock** adjustment. However, before making the adjustment, be sure that the picture can be made to remain stationary up and down (sync vertically) as lack of both vertical and horizontal sync is an indication of trouble in the sync circuits such as a defective tube or component. Make the **Horiz. Lock** adjustment as follows:

a. Allow the set to warm up. Tune in a station and adjust the **Brightness** and **Contrast** controls for average settings. Important: Before proceeding, be sure that **Noise Gate** control is adjusted according to the instructions given in this manual.

b. Turn the **Horizontal** control (on front panel) fully to the left. Slowly rotate the **Horizontal** control to the right while interrupting the video signal by switching the **Channel Selector** off and on a station several times. The picture should pull-in (sync) through at least three fourths of the range of the **Horizontal** control. If it does not, set the **Horizontal** control to the center of its range. Slowly turn the **Horiz. Lock** control to the right or left, until the picture synchronizes. It may require a few turns to make the range of the **Horizontal** control proper.

ADJUST FOCUS

Focus adjustment can be made on these sets without removing the cabinet back from the receiver by rotating the flexible shaft extending from the rear of the focus assembly. Set the **Contrast** control for normal picture and the **Brightness** control at slightly above average brightness. Rotate the focus control shaft to the right or to the left until the picture is in sharp focus. If the picture was greatly out of focus, readjust the ion trap.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

TROUBLE SHOOTING CHART

DEAD SET

Symptoms	Check
Dead receiver (no sound, no raster).	a. Power line circuit (interlocking connector). b. Rectifier circuit (V501). c. Power transformer (T501). d. "TV-RAD-PHO" switch in "Pho" position in combination models. e. Plug M704, in combination models.

PICTURE

No picture, or intermittent picture. Raster and sound OK.	a. Video amplifier circuit (V304) for defective tube or other component. Check contrast control for open, and setting of Noise Gate control. b. Waveform at V304. c. Gated AGC tube V306 (6AU6). d. RF and IF amplifier tubes.
Weak picture (insufficient contrast). Sound and raster OK.	*a. Alignment of individual channel slugs. b. VHF tuner circuit (V101, V102) for weak tubes, components, or alignment. c. IF amplifier stages (V301, V302, V303A) for weak tubes, components, or alignment. d. Video detector circuit (V303B) for defective component. e. Video amplifier circuit (V304) for weak tube or open peaking coil.
Poor horizontal linearity. Insufficient width. Insufficient brightness.	a. Horizontal drive setting (R433 or C421). b. Horizontal output tube (V406) by substitution. c. Damper tube (V408) by substitution. d. Rectifier tube (V501).
Picture jitter (sideways).	a. Check adjustment of Noise Gate. b. Horizontal hold and/or lock adjustment in weak signal areas. c. Change horizontal output tube (V406) if sections of the picture are displaced. d. For noisy or microphonic tube(s) or poor connections in the RF, IF, video and sweep sections of the receiver. Check horizontal output tube (V406) by substitution. e. Noise pick-up in antenna or transmission line. Adjust Noise Gate.
Smeared effect in picture (poor low frequency response).	*a. Setting of Tuning control. b. Trouble may be at transmitter. Check on another station. c. Video detector (V303B) and circuit components. d. Video amplifier tube (V304) or open peaking coil. e. Alignment of VHF Tuner and IF stages.
Poor picture detail (poor definition).	*a. Setting of Tuning control. b. Antenna and transmission line for reflections (fine ghosts), possibly due to incorrect termination or routing. c. RF and IF alignment. d. Video detector (V303B) and circuit components. e. Video amplifier tube (V304) and circuit components.
Sound bars in picture.	*a. Setting of Tuning control. b. Microphonic tube (V102 most probable) in RF or IF circuits. c. Oscillation in IF system; check for open by-pass capacitor. d. Alignment of RF and IF stages.
"Snow" in picture background.	a. Antenna and transmission line; may be due to incorrect termination, routing or orientation. b. For weak signal input by comparison to set known to be good. Location may be beyond normal service area of station. c. Noisy tubes in VHF tuner; V102 most probable cause. d. Second anode power supply for corona discharge.
Vertical bars on right side of picture.	a. Horizontal oscillator tube (V405) by substitution. b. Horizontal output tube (V406) by substitution. c. Damper tube (V408) by substitution.
Light and dark vertical bars. Bad horizontal linearity.	a. Damper tube (V408) by substitution. b. Horizontal output tube (V406) by substitution. c. Horizontal drive R433 or C421 and adjust.
Two heavy black horizontal bars covering picture tube screen.	a. Power supply circuit for open or leaky filter capacitor. b. Voltage in B+ circuit for shorted capacitor.
Picture Bending at top of picture.	a. Hor. Lock adjustment L401. b. See Run 12 under "Production Changes."

* Individual channel oscillator slug may be misaligned.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

SOUND and PICTURE

Symptoms	Check
***No sound or picture. Raster OK.**	a. VHF tuner circuit (V101, V102); check tubes and coil contacts. b. IF stages (V301, V302, V303A); check tubes and components. c. Check video detector V303B and peaking coils L307 and L308. d. Waveforms at video detector V303B and video amplifier V304.

SYNC

Poor horizontal and vertical sync in extreme fringe areas.	a. Adjust Noise Gate.
No vertical sync. Horizontal sync OK.	a. Integrator network for defective components. b. Waveform at pin 1 of V402.
No horizontal or vertical sync. Picture signal OK.	a. Tubes V401 and V402A by substitution. b. Sync separator (V401) by substitution. c. Sync inverter tube (V402A) by substitution. d. Waveforms at sync circuits. e. Noise Gate setting.
No horizontal sync; vertical sync OK.	a. HOR. LOCK L401 adjustment. b. Sync inverter tube (V402A) and circuit components. c. Sync discriminator tube (V404) and circuit components. d. Horizontal oscillator tube (V405) and circuit components. e. Resistor R428. f. Waveforms at V402A, V404, V405.
Picture "locks in" only at center of Hor. Hold control. Falls out on both sides.	a. Sync discriminator tube (V404) and circuit components. Check tolerance of capacitors and resistors; R424 or R425 is common cause.
Vertical roll, horizontal jitter.	a. Setting of Noise Gate.

RASTER

No raster. Sound OK.	a. Fuse M503. b. Ion trap adjustment. c. Tubes V305, V404, V405, V406, V407, V408. d. Horizontal oscillator circuit (V405). e. Horizontal output transformer (open). f. Horizontal output circuit (V406). g. Damper circuit (V408). h. Leaky or shorted coupling C419, C420, C421. i. 2nd anode power supply (V407, V408). 2nd anode voltage (rectified by 1B3GT rectifier) is obtained by the auto transformer action of the primary circuit of the horizontal output transformer. Failure of the horizontal oscillator (V405) or horizontal output tube (V406) will cause no voltage to be developed in the 2nd anode supply circuit, since no sweep voltage is introduced in the primary of the horizontal output transformer. Waveforms at V404, V405, V406, V408.
Bright vertical line. No horizontal deflection, no raster.	a. Open deflection yoke (M402B). b. Open capacitor (C428).
Raster too small (insufficient height and width).	a. Height and width adjustments (R417 and L402). b. Tubes V406 and V501. c. Power supply voltage (V501); check for open filter capacitor. d. Low AC line voltage. e. Gas contents will decrease the deflection sensitivity of the picture tube (improper focus will also result).
Excessive raster brilliance. Brightness control has no effect.	a. Picture tube (V305) by substitution. b. Picture tube circuit; R332 open.
No raster, fuse M401 blows when set seems to be operating OK.	a. Damper tube V408. b. V406, V408 circuit for shorted capacitor. c. High voltage arc-over; check V407 tube socket.
Vertical lines or "wrinkles" on left side of raster.	a. Spurious oscillations in horizontal output (V406, V408); replace tubes. b. Deflection yoke; check C427, R444. c. Horizontal drive (R433 or C421) setting.
Dim raster. Brightness control operation reversed. No sound or picture.	a. V204 sound output tube.
Raster "blooms" (gets larger) as brightness is increased.	a. Horizontal output tube V406. b. 2nd anode rectifier V407 (1B3GT).

* Individual channel oscillator slug may be misaligned.

ADMIRAL (Continued)
Circuit for 21A3Z Chassis

PRODUCTION CHANGES

(2) Pin 2 of V203 (6AV6) was grounded. R211 & R212 were not used.

(3) R331, 1 Meg, connected from pin 11 of V305 (21AMP4A) to ground was removed. R333 changed from 270K to 180K. R413 was 1.2 Meg.

(4) Pin 6 of V306 (6AU6) was connected to unfused +270V. R316 was 1K. R331, 1 Meg, added from pin 11 of V305 (21AMP4A to ground. R333 was 180K.

(5) R338 was 180K.

(6) Outside foil of C212 moved from pin 4 of V204 (6DG6GT) to pin 8 of V204.

(7) Outside foil of C424 moved from ground to junction of R319 & R327.

(8) R329 changed from 270 K to 100K. R311 & R315 changed from 8.2K, 2W to 15K, 2W. R345 & R346 added across R311 & R315 respectively.

(9) R421 was 1000Ω, 2W.

(10) R347 added. Noise gate wired to also function as AGC delay control in sets stamped with the letter "H" in front of the code date.

(11) Horiz. Drive changed from variable resistance type to variable capacitor. Components on chassis shifted back to allow use of different 21AMP4A picture tube with letter "K" molded on its bowl.

(12) R333 changed to 180K, R437 changed to 8.2K, C429 added to Horiz. Osc.

(13) Same change as run 10 except chassis have letter "B" stamped in front of code date.

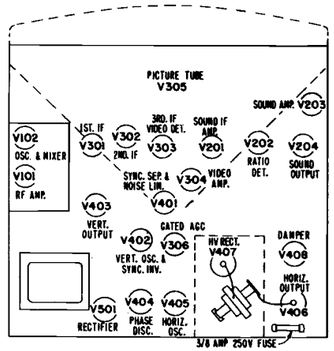
(14) R325 deleted. C331 added. R302, R303 deleted. R336 changed to 1 Meg. R305 changed to 5.6Meg and connected to pin 5 of V306. R304 connected to B+.

SCHEMATIC NOTES

②, ⑧, . . . etc. indicate production changes covered by a Run number. Run numbers are stamped at the rear of the chassis.

Ⓐ1, Ⓐ2, ... Ⓨ, Ⓩ, etc. indicate alignment points and alignment connections.

See page 19 for complete explanation of notes applicable to conditions for observing waveforms and measuring voltages shown on this diagram.



Top View of 21A3Z Chassis.

V101—6BZ7
V102—6J6
V201—6AU6
V202—6AL5
V203—6AV6
V204—6W6A or 6DG6GT
V301—6CB6
V302—6CB6
V303—6AM8
V304—12BY7
V305—21AMP4A
V306—6AU6
V401—6CS6
V402—6SN7GT
V403—12B4
V404—6AL5
V405—6SN7GT
V406—6CD6G
V407—1B3GT
V408—6AX4GT
V501—5U4G

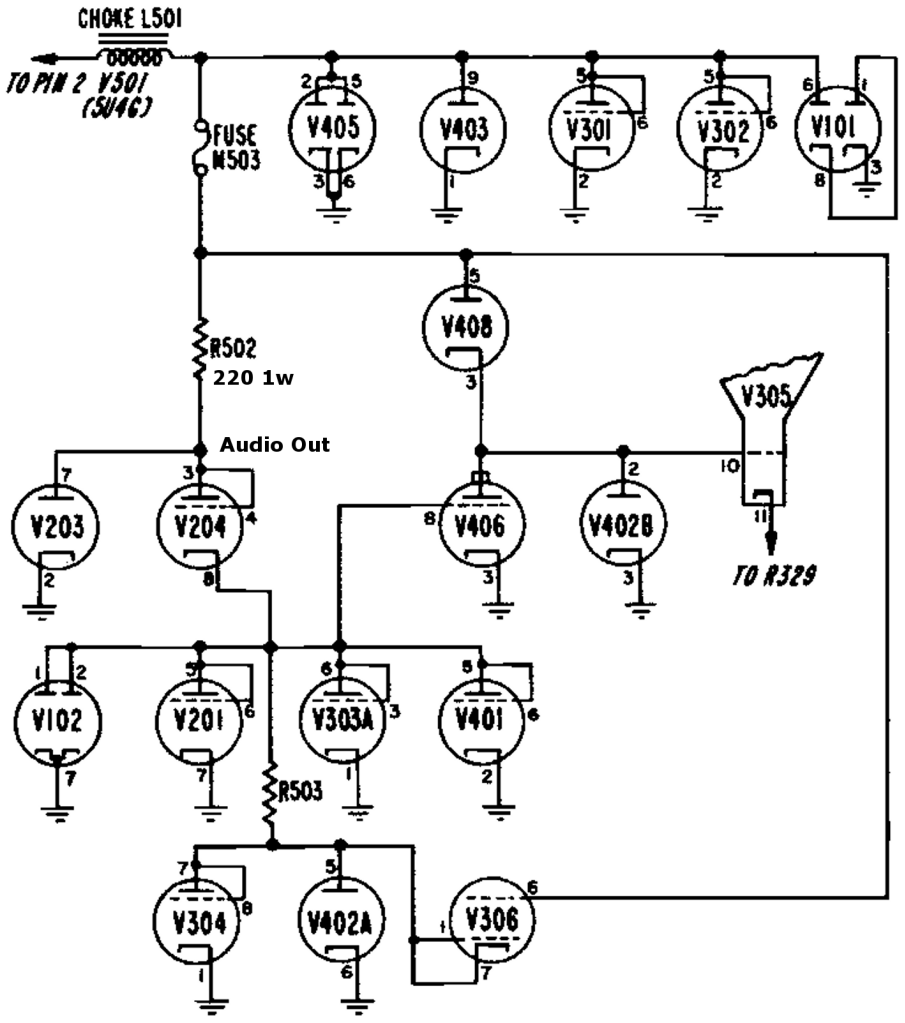
Schematic for 21A3Z Chassis Stamped RUN 1 Through RUN 14.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

B+ DISTRIBUTION

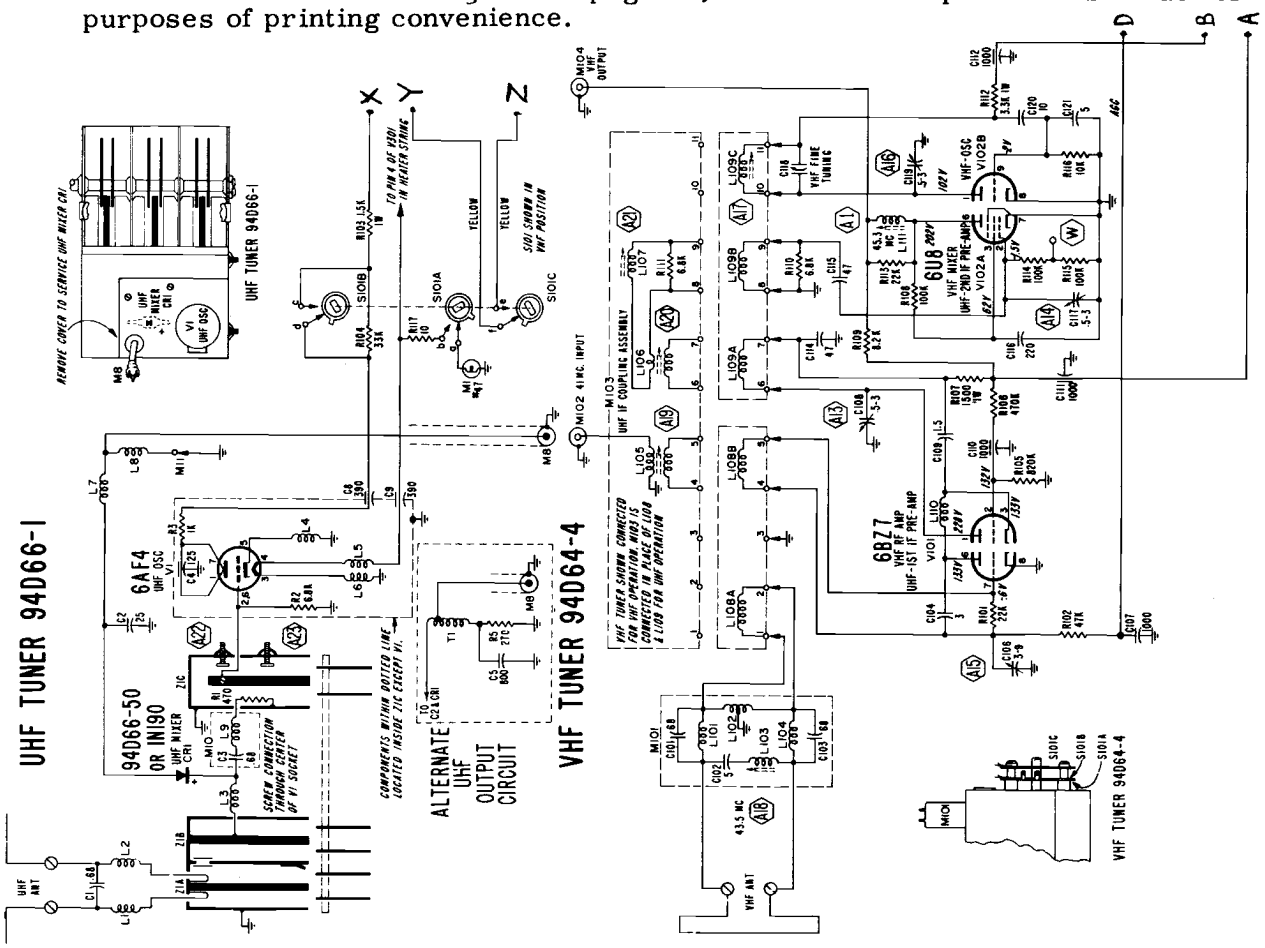
The power supply (after being filtered) provides approximately 265 volts of DC voltage for application to the receiver circuits. The distribution of this voltage to the various stages is a series-parallel arrangement. The horizontal and vertical deflection circuits, 1st and 2nd IF amplifiers and VHF amplifier require approximately 265 volts and thus are connected directly across the 265 volt line. All other circuits require approximately one-half of this voltage and obtain it from the cathode of the sound output tube V204 which functions as a series voltage regulator. All the current drawn by these circuits passes through V204, hence the B+ voltage (265 volts) is divided nearly equally between V204 and the stages connected to its cathode. The control grid of V204 is connected to a voltage dividing network consisting of R214 and R215, resulting in a fixed potential of approximately 130 volts being applied to the control grid. A change in the cathode voltage of V204 due to AGC fluctuations, tube current variations, etc., will cause a change in the grid to cathode voltage of V204. The resulting change in cathode current tends to maintain the 145 volt supply nearly constant. High value capacitors (C503 and C504) are necessary in the cathode circuit of V204 to reduce any fluctuations in current due to the audio current components flowing in this stage.



Simplified B+ Distribution Diagram Used in 21A3Z, 21A3AZ and 21G3Z Chassis.

ADMIRAL (Continued) UHF Tuner 94D66-1 and VHF Tuner 94D64-4

Wires marked X, Y, Z, and A, B, D, connect to correspondingly marked wires of the main schematic diagram on page 20, over. This separation is made for purposes of printing convenience.



SCHEMATIC NOTES

②, ③, . . . etc. indicate production changes covered by a Run number. Run numbers are stamped at the rear of the chassis.

(41), (42),.....(Y), (Z), etc. indicate alignment points and alignment connections.

IMPORTANT: Before making waveform and voltage measurements, see instructions at right.

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

NOTE. K=R × 1,000. MEG=R × 1,000,000. MF=microfarad.

CONDITIONS FOR OBSERVING WAVEFORMS

Warning: Pulsed high voltages are present at the caps of V406 and V407, and at pin 3 of V408. **Do not** attempt to observe waveforms at these points unless suitable test equipment is used. Waveforms at these points may be taken with a capacitive voltage divider probe. The waveform at pin 3 of V408 may also be taken by clipping or twisting the lead from the high side of the oscilloscope over the insulation on the lead connecting to pin 3. If the waveform is taken in this manner, its shape will be the same, but the peak-to-peak voltage will be lower, depending on the degree of coupling between the oscilloscope and the lead connecting to pin 3 of V408.

- Waveforms should resemble those shown on the schematic.
- Waveforms are taken with a transmitted signal input to the television chassis.
- Set all controls for normal picture. Be sure that the **Noise Gate** control is not advanced too far clockwise, as the picture may disappear entirely or the synchronizing waveforms will be distorted. After the receiver is set for a normal picture, turn the **Contrast** control fully clockwise.
- Oscilloscope sweep is set at 30 cycles for vertical waveforms and at 7,875 cycles for horizontal waveforms, to permit 2 complete cycles to be observed.
- Peak-to-peak voltages will vary from those shown on the schematic, depending on the test equipment employed and chassis parts tolerances.

CONDITIONS FOR MEASURING VOLTAGES

Warning: Pulsed high voltages are present at the caps of V406 and V407, and at pin 3 of V408. **Do not** attempt to measure voltages at these points without suitable test equipment. A VTVM with a high voltage probe should be used when measuring picture tube 2nd anode voltage.

- Set the **TV-Rad-Pho** switch to the "TV" position. Set the **Channel Selector** on an unused channel. **Contrast** control fully clockwise. All other controls fully counterclockwise. **Width** and **Horiz. Lin.** set fully to the left. Do not disturb **Horiz. Lock** and **Horiz. Drive** settings.
- Antenna disconnected and terminals shorted together.
- Line voltage: 117 volts AC.
- DC voltages measured with a VTVM between tube socket terminals and chassis, unless otherwise indicated.
- Voltages at V101 and V102 measured from the top ot the chassis with tubes in socket. Use of an adapter is recommended.
- Voltages at V305 socket measured with socket removed from tube.
- Voltages marked (*) will vary widely with control settings.
- Voltages on 3D1A radio chassis measured with TV-Rad-Pho switch in "Rad" position.

Admiral

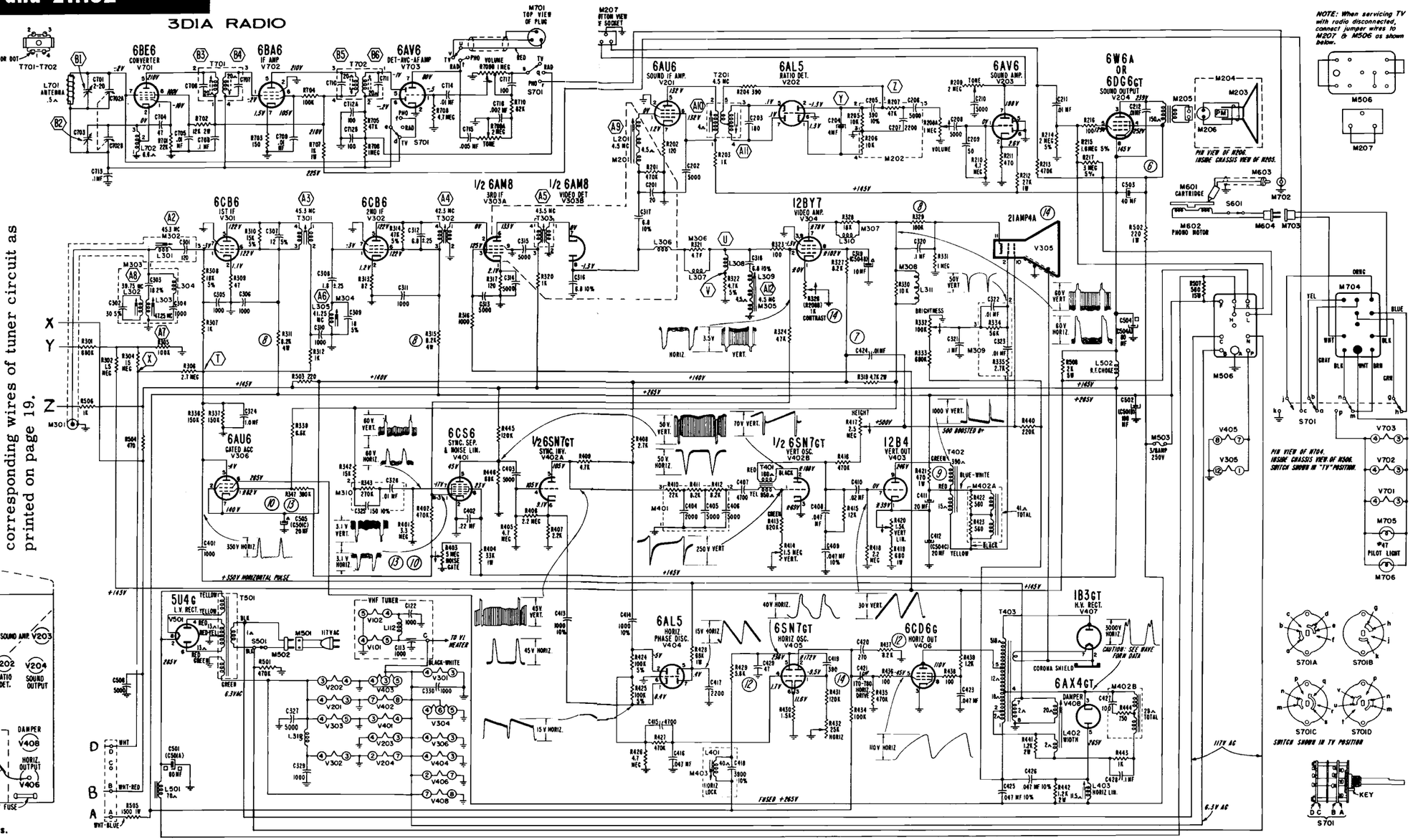
for Models Using 41 MC IF Chassis
21B3Z, 21D3Z and 21H3Z

See page 19 for schematic notes and explanation of conditions for measuring voltages and observing waveforms.

VOLUME TV-10, ADDITIONAL 1955 TELEVISION SERVICING INFORMATION

Schematic for 21D3Z Chassis Stamped RUN 1 Through RUN 14. ADMIRAL (Continued)

Use this circuit when servicing Chassis 21B3Z, 21D3Z, and 21H3Z. This circuit is exact for 21D3Z. Chassis 21B3Z is a straight television set and does not include 3D1A radio or record changer. Chassis 21H3Z uses a 27RP4 picture tube and has other minor changes.



(6) Outside foil of C212 moved from pin 4 of V204 (6DG6GT) to pin 8 of V204.

(7) Outside foil of C424 moved from gnd. to junction of R319 & R327.

(8) R329 changed from 270K to 100K. R311 & R312 changed from 8.2 K, 2W to 15K, 2W. R345 & R346 added across R311 & R315 respectively.

(9) R421 changed 1K to 470.

(10) R338 removed, R347 added. Noise gate wired to function also as an AGC delay control.

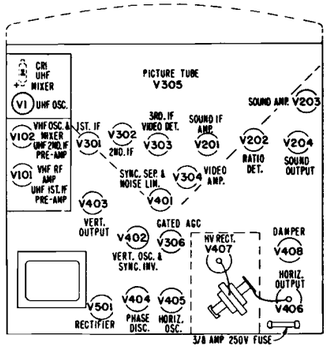
(11) No changes made under this run number.

(12) C429 added, R437 changed to 8.2K.

(13) Some change as run 10 except chassis do not have letter "B" or "N" stamped in front of code date.

(14) Horiz. Drive changed from variable resistance type to variable capacitor. Components on chassis shifted back to allow use of different 21AMP4A picture tube with letter "K" molded on its bowl. R325 deleted.

Wires X, Y, Z, and A, B, D, connect to corresponding wires of tuner circuit as printed on page 19.



Top View of 21D3Z Chassis.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

TELEVISION ALIGNMENT PROCEDURE

The following alignment pages are marked at the top to indicate whether the information applies to both 21 MC and 41 MC sets or applies to only one. BE SURE YOU ARE FOLLOWING THE CORRECT PROCEDURE FOR THE CHASSIS BEING ALIGNED.

ALIGNMENT TOOLS

The following alignment tools are required. They can be obtained from the Admiral distributor under the part numbers listed below:

Metal alignment screwdriver part number 98A30-9.

Non-metallic (fiber) alignment screwdriver (11½" long, ⅛" diameter) part number 98A30-10.

Non-metallic alignment wrench (9" long, for hexagonal core IF slugs) part number 98A30-12.

IMPORTANT ALIGNMENT HINTS

The following suggestions should be performed if difficulty is experienced during the alignment procedure.

1. IF CIRCUIT INSTABILITY: When spot frequency aligning the IF amplifiers, the VTVM pointer may swing when the hand is placed too near the IF transformers. When viewing the IF response curve on an oscilloscope, the curve may change shape with hand capacity, especially when aligning A5 (3rd IF transformer T303). To correct either of these conditions, the following alignment hints should be tried:

(a) Check the generator output leads to be certain that the unshielded portion (especially the grounded lead) is as short as practicable.

(b) Be sure that a decoupling network is used at the video detector output and that the leads on the network are kept as short as possible (See figure 13).

(c) The use of a nine inch hexagonal alignment tool will permit adjustment without encountering "hand capacity" effects. See "Alignment Tools".

2. RECEIVER OVERLOADING WHEN CHECKING THE OVER-ALL RESPONSE CURVE: Due to the inherent high sensitivity of these receivers, it is very easy to cause overloading of the third IF amplifier stage. In some cases, generator leakage alone is enough to produce a response curve on the oscilloscope. To prevent overloading, the following things should be done:

(a) Be certain that the generator output attenuators are set for a minimum output.

(b) Some generators have a built-in pad in the output cable. Be sure that the pad in the cable is properly connected in the circuit. Refer to the generator instruction manual for details.

(c) If a pad is not built in, the 12 db pad shown below in figure 12 can be constructed and connected between the generator and the antenna terminals.

3. ADJACENT CHANNEL TRAP: If difficulty is experienced in aligning A7 and A8 traps using the method outlined in the alignment procedure on page 13 or 17, try the following procedure:

(a) Connect high side of oscilloscope to pin 7 (plate) of video amplifier V304 (12BY7) and common to chassis.

(b) Make all connections and receiver control settings as instructed in steps 5 and 6 of the alignment procedure on page 13 or 17.

(c) Amplitude modulate the signal from the marker generator with an audio frequency. Full generator output may be needed.

(d) Adjust A7 and A8 for minimum amplitude of the audio waveform on the oscilloscope.

4. For injecting 21MC or 41MC IF Signals, use an insulated tube shield over V102 Oscillator-Mixer tube. Insulate bottom of tube shield with masking tape, see figure 11.

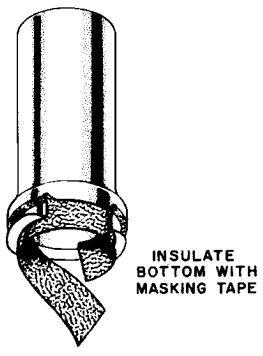


Figure 11. Special Tube Shield for IF Alignment and IF Response Curve Check.

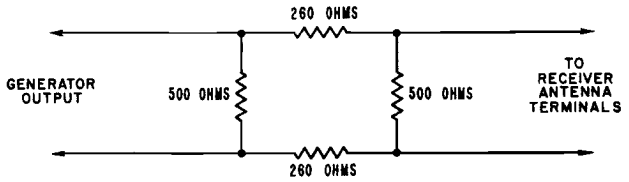


Figure 12. Illustration of 12db Attenuation Pad for Viewing Over-all RF-IF Response Curve.

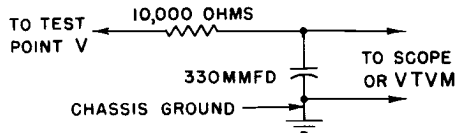


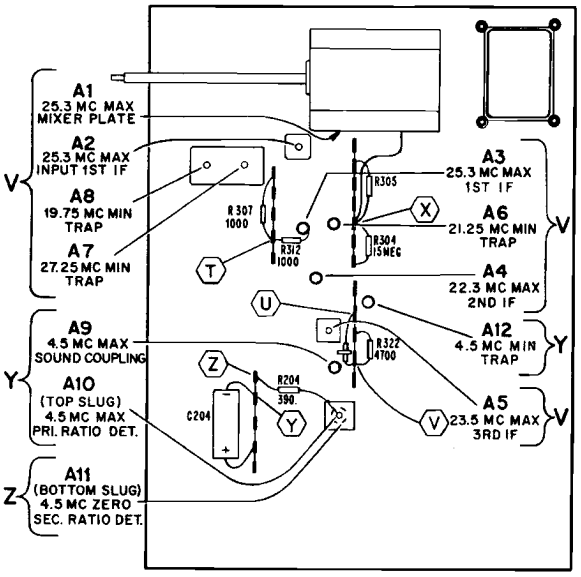
Figure 13. Decoupling Filter.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

SIMPLIFIED ALIGNMENT

After becoming familiar with alignment procedure, some servicemen simplify subsequent alignment of sets by merely using the essential alignment data given in figures 14, 15, 19 and 26.



NOTE: In early production, there was an extra lug on the terminal strip containing test point (X) that was not used.

Figure 14. Bottom View of VHF Only Chassis Showing Test Point Connections and IF Alignment Data.

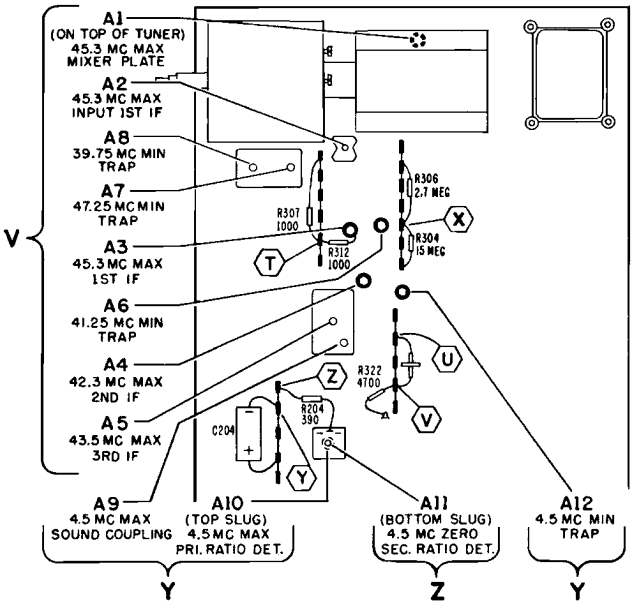


Figure 15. Bottom View of VHF-UHF Chassis Showing Test Connections and IF Alignment Data.

FREQUENCY TABLE FOR CHASSIS WITH 41 MC IF SYSTEM

FOR CHASSIS WITH 21 MC IF SYSTEM, SEE FOOTNOTE †

Channel No.	Freq. Range MC	Picture Carrier MC	Sound Carrier MC	Osc. Freq. MC	Sweep Gen. Center Freq. MC
2	54-60	55.25	59.75	*101	57.5
3	60-66	61.25	65.75	*107	63.5
4	66-72	67.25	71.75	*113	69.5
5	76-82	77.25	81.75	*123	79.5
6	82-88	83.25	87.75	*129	85.5
7	174-180	175.25	179.75	*221	177.5
8	180-186	181.25	185.75	*227	183.5
9	186-192	187.25	191.75	*233	189.5
10	192-198	193.25	197.75	*239	195.5
11	198-204	199.25	203.75	*245	201.5
12	204-210	205.25	209.75	*251	207.5
13	210-216	211.25	215.75	*257	213.5
14	470-476	471.25	475.75	517	473.5
15	476-482	477.25	481.75	523	479.5
16	482-488	483.25	487.75	529	485.5
17	488-494	489.25	493.75	535	491.5
18	494-500	495.25	499.75	541	497.5
19	500-506	501.25	505.75	547	503.5
20	506-512	507.25	511.75	553	509.5
21	512-518	513.25	517.75	559	515.5
22	518-524	519.25	523.75	565	521.5
23	524-530	525.25	529.75	571	527.5
24	530-536	531.25	535.75	577	533.5
25	536-542	537.25	541.75	583	539.5
26	542-548	543.25	547.75	589	545.5
27	548-554	549.25	553.75	595	551.5
28	554-560	555.25	559.75	601	557.5
29	560-566	561.25	565.75	607	563.5
30	566-572	567.25	571.75	613	569.5
31	572-578	573.25	577.75	619	575.5
32	578-584	579.25	583.75	625	581.5
33	584-590	585.25	589.75	631	587.5
34	590-596	591.25	595.75	637	593.5
35	596-602	597.25	601.75	643	599.5
36	602-608	603.25	607.75	649	605.5
37	608-614	609.25	613.75	655	611.5
38	614-620	615.25	619.75	661	617.5
39	620-626	621.25	625.75	667	623.5
40	626-632	627.25	631.75	673	629.5
41	632-638	633.25	637.75	679	635.5
42	638-644	639.25	643.75	685	641.5
43	644-650	645.25	649.75	691	647.5
44	650-656	651.25	655.75	697	653.5
45	656-662	657.25	661.75	703	659.5
46	662-668	663.25	667.75	709	665.5
47	668-674	669.25	673.75	715	671.5
48	674-680	675.25	679.75	721	677.5
49	680-686	681.25	685.75	727	683.5
50	686-692	687.25	691.75	733	689.5
51	692-698	693.25	697.75	739	695.5
52	698-704	699.25	703.75	745	701.5
53	704-710	705.25	709.75	751	707.5
54	710-716	711.25	715.75	757	713.5
55	716-722	717.25	721.75	763	719.5
56	722-728	723.25	727.75	769	725.5
57	728-734	729.25	733.75	775	731.5
58	734-740	735.25	739.75	781	737.5
59	740-746	741.25	745.75	787	743.5
60	746-752	747.25	751.75	793	749.5
61	752-758	753.25	757.75	799	755.5
62	758-764	759.25	763.75	805	761.5
63	764-770	765.25	769.75	811	767.5
64	770-776	771.25	775.75	817	773.5
65	776-782	777.25	781.75	823	779.5
66	782-788	783.25	787.75	829	785.5
67	788-794	789.25	793.75	835	791.5
68	794-800	795.25	799.75	841	797.5
69	800-806	801.25	805.75	847	803.5
70	806-812	807.25	811.75	853	809.5
71	812-818	813.25	817.75	859	815.5
72	818-824	819.25	823.75	865	821.5
73	824-830	825.25	829.75	871	827.5
74	830-836	831.25	835.75	877	833.5
75	836-842	837.25	841.75	883	839.5
76	842-848	843.25	847.75	889	845.5
77	848-854	849.25	853.75	895	851.5
78	854-860	855.25	859.75	901	857.5
79	860-866	861.25	865.75	907	863.5
80	866-872	867.25	871.75	913	869.5
81	872-878	873.25	877.75	919	875.5
82	878-884	879.25	883.75	925	881.5
83	884-890	885.25	889.75	931	887.5

* For oscillator frequencies from channels 2 to 13, frequency indicated is that of VHF oscillator. For oscillator frequencies higher than channel 13, frequency indicated is that of UHF oscillator with VHF oscillator inoperative.

† For channels 2 through 13, subtract 20 MC from Oscillator Frequency for chassis with a 21 MC IF system.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

Information on this page applies ONLY to 21 MC Chassis 21A3Z, 21A3AZ, 21C3Z and 21G3Z.

21 MC IF AMPLIFIER AND TRAP ALIGNMENT

See page 28 for 41 MC IF Amplifier and Trap Alignment.

- Connect bias supply negative to test point "T", see figure 14, positive to chassis. 3 volts is required for steps 1, 2, 3, 4, 7 and 8. 1½ volts is required for steps 5 and 6. 4½ volts is required for step 7.
- Disconnect antenna. Connect a jumper wire across antenna terminals.
- Set **Channel Selector** to channel 12 or other unassigned high channel to prevent interference during alignment.
- Set **Contrast** control fully counterclockwise.
- Allow about 15 minutes for receiver and test equipment to warm up.
- Use lowest DC scale on VTVM.

Step	Signal Gen. Freq.	VTVM and Signal Generator Connections	Instructions	Adjust
1	25.3 MC	VTVM high side to test point "V" through a decoupling filter, common to chassis. See figures 13 and 14. Connect generator high side to top of insulated tube shield for 6J6 (V102); connect low side to chassis near tube shield. See figure 11.	Use 3 volts bias. Use lowest DC scale on VTVM. When peaking, keep reducing generator output for VTVM reading of approx. 1 volt or less. Set **Channel Selector** to channel 12 or other unassigned high channel.	A1, A2 and A3 for maximum.
2	22.3 MC			A4 for maximum.
3	23.5 MC			A5 for maximum.
4	*21.25 MC			A6 for minimum.
5	*27.25 MC*	Connect generator and VTVM same as in step 1.	Use 1½ volts bias. Set **Channel Selector** same as in step 1.	A7 for minimum.
6	*19.75 MC			A8 for minimum.
7	25.3 MC	Connect generator and VTVM same as in step 1.	Use 4½ volts bias. Set **Channel Selector** same as in step 1.	Readjust A1, A2 and A3 for maximum.
8	To insure correct IF alignment, make "IF Response Curve Check" given below.			

IF RESPONSE CURVE CHECK

Receiver Controls and Bias Supply	Sweep Generator	Marker Generator	Oscilloscope	Instructions
Set **Channel Selector** on channel 12 or an unassigned high channel. **Contrast** control fully to the left. Connect negative 4½ volts bias to test poiht "T", positive to chassis.	Connect high side to top of insulated tube shield, low side to chassis, see figure 11. Set sweep frequency to 23MC, and sweep width approximately 7MC.	If an external marker generator is used, loosely couple high side to sweep generator lead on top of tube shield, low side to chassis. Marker frequencies indicated on IF Response Curve.	Connect to test point "V" through a decoupling filter. See figures 13 and 14. Marker pips on scope will be more distinct if a capacitor of 100 mmf to 1000 mmf is connected across the oscilloscope input.	Check curve obtained against ideal response curve in fig. 16. Note tolerances on curve. Keep marker and sweep outputs at a minimum to prevent overloading. A reduction in sweep output should reduce response curve amplitude without altering the shape of the response curve. If the curve is not within tolerance or the markers are not in the proper location on the curve, touch-up IF slugs as instructed below. If curve changes shape with hand capacity, see "IF Instability" on page 22.

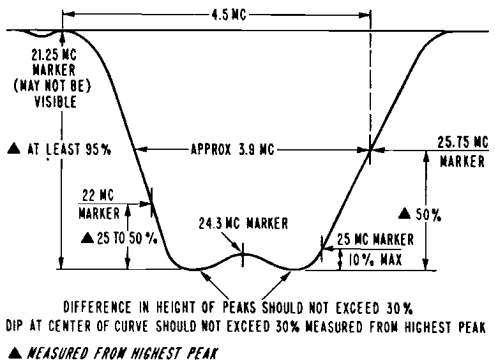


Figure 16. Ideal IF Response Curve.

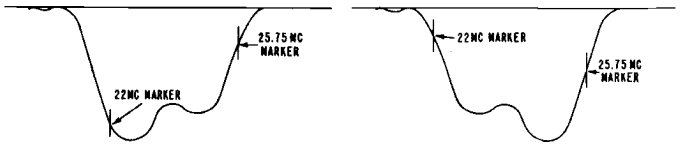


Figure 17. IF Response Curves, Incorrect Shape.

If it is necessary to adjust for approximate equal peaks, carefully adjust slug A5 (23.5 MC). It should not be necessary to turn slug more than one turn in either direction.

If the curve cannot be made to resemble the response curve shown at left, repeat all steps under "IF Amplifier and Trap Alignment" making sure that generator frequencies are accurate and adjustments are carefully made. If a satisfactory curve cannot be obtained after repeating these steps, it may be necessary to change IF amplifier tubes or check for a defective circuit component to be sure that each stage is operating properly.

* Before proceeding, be sure to check the signal generator used in alignment against a crystal calibrator or other frequency standard for absolute frequency calibration. Also see "Adjacent Channel Trap" on page 22.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

Information on this page applies to BOTH 21 MC and 41 MC Chassis.

4.5 MC SOUND IF AND TRAP ALIGNMENT

- Allow about 15 minutes for receiver and test equipment to warm up.
- Set **Contrast** control fully to the right (clockwise).
- Ratio Detector Transformer (T201) must be aligned from the bottom of chassis. Use alignment tool number 98A30-12 obtainable from your Admiral distributor.

It is preferable to use a TV signal instead of a signal generator for this alignment. However, if a TV signal is not available, a signal generator which has been checked against a crystal calibrator or other frequency standard, may be used. Accuracy required is within one kilocycle.

Step	VTVM Connections	Instructions for TV Signal	Instructions for Signal Generator	Adjust
1	High side to test point "Y", common to chassis.	Connect VHF antenna to receiver. Set VHF channel selector to the strongest TV signal available and adjust "Fine Tuning" control on front panel for highest indication on VTVM. Note: Sound bars may be present in picture at this setting.	Disconnect VHF antenna and connect a wire jumper across antenna terminals. Set VHF channel selector to an unused channel. Set signal generator to exactly 4.5 MC and connect high side to test point "U" through a .01 mf. capacitor; connect low side to chassis.	A9 and A10 for maximum (if using signal generator keep reducing output to keep VTVM on lowest scale possible).
2	High side to test point "Z", common to chassis.	Same as in step 1. Use Zero center scale on VTVM, if available.	Same as in step 1. Use Zero center scale on VTVM, if available.	A11 for Zero on VTVM (the correct zero point is located between a positive and a negative maximum). If A11 was far off, repeat step 1.
3	High side to test point "Y", common to chassis.	Follow instructions under step 1 except connect a jumper wire across L307.	Follow instructions under step 1 except connect signal generator high side to test point "U" through a .01 mf. capacitor, connect low side to chassis. Connect a jumper wire across peaking coil L307.	A12 for minimum.

TOUCH-UP OF RATIO DETECTOR SECONDARY USING TELEVISION SIGNAL (A11, BOTTOM SLUG OF T201)

Adjustment need be made on one channel only.

This adjustment is accessible through the hole (just below T201) in bottom of the cabinet or the chassis mounting shelf, located toward the right side facing the rear of the set. Removal of the chassis is therefore not required.

Proceed as follows:

a. Turn set on and allow about 15 minutes for warm up.

b. Tune set for normal picture and sound.

c. Carefully insert a ***non-metallic*** alignment tool through the opening in cabinet bottom below T201. An alignment tool with a hexagonal end is required. The bottom slug adjustment A11 can be made by using alignment tool, part number 98A30-12, (available at Admiral distributor). When the alignment tool engages the bottom tuning slug A11, adjust the slug for best sound with minimum buzz level. Do this carefully as only slight rotation in either direction will genreally be required. Correct adjustment point is located between the two maximum buzz peaks that will be noticed when turning the slug back and forth about ¼ to ½ turn.

d. If necessary, repeat individual channel slug adjustment and retouch the ratio detector secondary. Note: If oscillator adjustment is required for other channels, it will ***not*** be necessary to repeat the ratio detector secondary adjustment after ***once*** correctly adjusting it.

ALIGNMENT OF 4.5 MC TRAP A12, USING A TELEVISION SIGNAL

Beat interference (4.5 MC) appears in picture as very fine vertical or diagonal lines, very close together, having a "gauze-like" appearance. The pattern will vary with speech, forming a very fine herringbone pattern.

The trap can be tuned by watching the picture and adjusting the slug A12 for minimum 4.5 MC interference. If greater accuracy is required, the trap should be adjusted as instructed in step 3 above.

UHF CHANNEL STRIPS

Admiral UHF channel strips convert all VHF turret tuners, for UHF reception. These strips are easily and economically installed and eliminate any necessity for external UHF converters or adapters. Complete information for ordering Admiral UHF channel strips, installation instructions, and other UHF data is included in Form No. S523 which can be obtained from your Admiral distributor.

HIGH VOLTAGE WARNING

High voltages are present throughout the horizontal output, damper and second anode supply circuits. No attempt should be made to make measurements from high voltage points in these circuits with ordinary test equipment.

Caution: Operation of the set outside of the cabinet or with cabinet back removed involves shock hazard. Exercise normal high voltage precautions.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

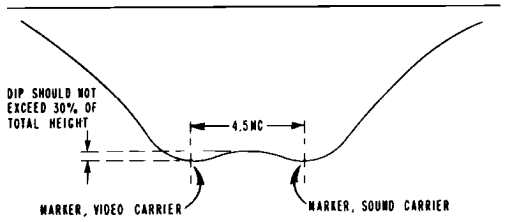
Information on this page applies ONLY to 21 MC Chassis 21A3Z, 21A3AZ, 21C3Z and 21G3Z.

VHF AMPLIFIER AND MIXER ALIGNMENT

See page 29 for VHF Amplifier and Mixer Alignment for 41 MC Chassis.

- Connect negative of 3 volt bias supply to test point "X", positive to chassis.
- Connect sweep generator 300 ohm output to antenna terminals. If sweep generator does not have a built-in marker generator, loosely couple a marker generator to the antenna terminals. To avoid distortion of the response curve, keep sweep generator output at a minimum, marker pips just barely visible.
- Connect oscilloscope to test point "W" on tuner (figure 19). Keep scope leads away from chassis.
- Allow about 15 minutes for receiver and test equipment to warm up.

Step	Marker Gen. Freq. (MC)	Sweep Gen. Frequency	Instructions
1	193.25 MC (Video Carrier) 197.75 MC (Sound Carrier)	Sweeping Channel 10. See "Frequency Table".	Set Channel Selector to channel 10. Check response obtained with RF response curve shown in figure 18. Alternately adjust A13 and A14 (figure 19) as required to obtain equal peak amplitudes and symmetry consistent with proper bandwidth and correct marker location.
2	83.25 MC (Video Carrier) 87.75 MC (Sound Carrier)	Sweeping Channel 6. See "Frequency Table".	Set Channel Selector to channel 6. Check response obtained with RF response curve shown in figure 11. Adjust A15 as required to obtain curve having maximum amplitude and flat top appearance consistent with proper bandwidth and correct marker location. After completing adjustment, recheck adjustment of step 1.
3	Set the sweep generator to sweep the channel to be checked. Set the marker generator for the corresponding video carrier frequency and sound carrier frequency.		Check each channel operating in the service area for curve shown below. In general, the adjustment performed in steps 1 and 2 are sufficient to give satisfactory response curves on all channels. However, if reasonable alignment is not obtained on a parcticular channel, (a) check to see that coils have not been intermixed, or (b) try replacing the pair of coils for that particular channel, or (c) repeat step 1 for a weak high channel as a compromise adjustment to favor the particular channel. Repeat step 2 for the weak low channel to favor the particular channel. If a compromise adjustment is made, other channels operating in the service area should be checked to make certain that they have not been appreciably affected.



Full skirt of curve will not be visible unless generator sweep width extends beyond 10 MC.

Figure 18. RF Response Curve.

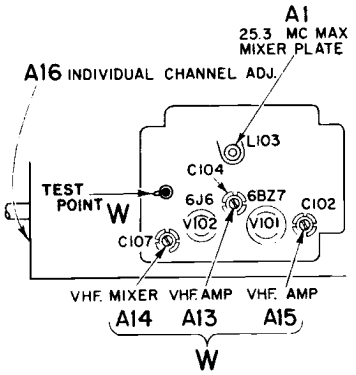


Figure 19. Top of TV Tuner 94D61-2 or -3, Showing Adjustment Locations.

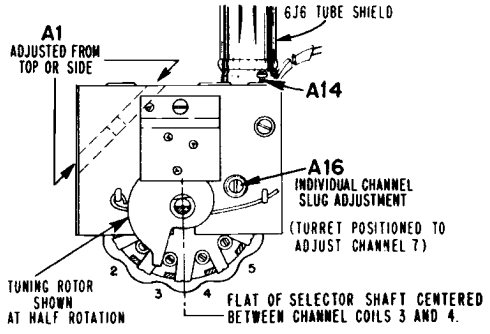


Figure 20. Front View of TV Tuner 94D61-2 or -3. Bottom Cover Removed.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

Information on this page applies BOTH to 21 MC and 41 MC Chassis.

OVER-ALL RF AND IF RESPONSE CURVE CHECK

Receiver Controls and Bias Supply	Sweep Generator	Marker Generator	Oscilloscope	Instructions
Contrast control fully to the left. **Channel Selector** on channel 12 or other unassigned high channel. Connect negative of 4½ volt bias supply to test point "T", positive to chassis.	Connect to antenna terminals. Set generator to sweep channel selected. See frequency table on page 23. Keep generator output as low as possible to prevent overloading.	If an external marker generator is used, loosely couple high side to sweep generator lead. Marker frequencies are shown in frequency table on page 23.	Connect to point "V" through a decoupling filter. See figures 13, 14 and 15.	Compare response curve obtained against ideal curve shown in figure 21. If the curve is not within tolerance, touch up A5 as instructed below. It should never be necessary to turn A5 more than one turn in either direction. If the curve is satisfactory on the channel checked, all other channels should also be satisfactory. **IMPORTANT:** When sweep output is reduced, response curve amplitude on scope should also decrease, but curve shape should remain the same. If curve shape changes, reduce sweep output and/or the scope gain until the shape does not change.

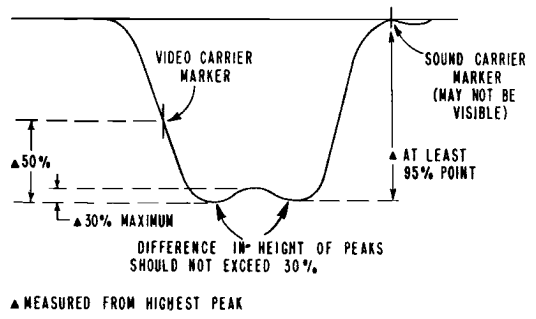


Figure 21. Ideal Over-all RF and IF Response Curve.

Note that video marker on the "Over-all RF-IF Response Curve" in figure 21 will appear on the opposite side of the curve as compared to the "IF Response Curve", figure 16. This is due to action of the mixer tube.

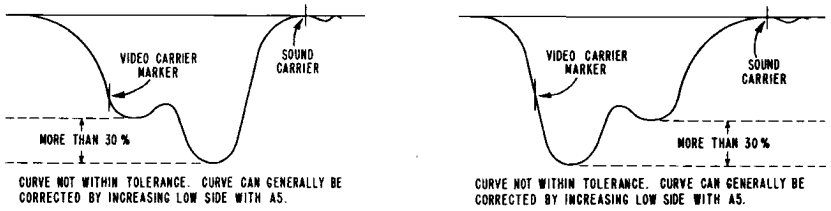


Figure 22. Over-all RF and IF Response Curves, Incorrect Shape.

VHF OSCILLATOR ADJUSTMENT USING SIGNAL GENERATOR

It is always advisable to make VHF oscillator adjustments using a Television Signal as instructed on page 13. If a Television Signal is not available, VHF oscillator adjustment can be made using a crystal calibrated signal generator. Make adjustments as follows:

Receiver Control Settings	Signal Generator	Instructions
Set **Channel Selector** for each channel to be adjusted. Set **Fine Tuning** control at half rotation. Turn **Volume** control fully clockwise.	Connect to antenna terminals. Set generator to exact frequency of VHF oscillator. See frequency table on page 23. **Set generator for maximum output.**	Connect a wire jumper from test point "W" on the tuner to test point "Z". See figure 14 or 15. Remove the ratio detector tube V202 (6AL5). Carefully adjust the individual oscillator slug (see figures 20 and 27) until a zero beat is heard in the speaker of the receiver.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

Information on this page applies ONLY to 41 MC IF Chassis 21B3Z, 21D3Z and 21H3Z.

41 MC IF AMPLIFIER AND TRAP ALIGNMENT

See page 24 for 21 MC IF Amplifier and Trap Alignment

- Connect bias supply negative to test point "T", see figure 14, positive to chassis.
- Disconnect antenna. Connect a jumper wire across antenna terminals.
- Set **Low-Channel Selector** to channel 12 or other unassigned high VHF channel to prevent interference during alignment.
- Set **Contrast** control fully counterclockwise.
- Allow about 15 minutes for receiver and test equipment to warm up.
- Use lowest DC scale on VTVM.

Step	Signal Gen. Freq.	VTVM and Signal Generator Connections	Instructions	Adjust
1	45.3 MC	VTVM high side to test point "V" through a decoupling filter, common to chassis. See figures 13 and 15. Connect generator high side to top of insulated tube shield for 6U8 (V102); connect low side to chassis near tube shield. See figure 11.	Use 3 volt bias supply. Use lowest DC scale on VTVM. When peaking, keep reducing generator output for VTVM reading of approx. 1 volt or less. Set **Low-Channel Selector** to channel 12 or other unassigned high VHF channel.	A1, A2 and A3 for maximum.
2	42.3 MC			A4 for maximum.
3	43.5 MC			A5 for maximum.
4	41.25 MC			A6 for minimum.
5	47.25 MC	Connect generator and VTVM same as in step 1.	Use 1½ volt bias supply	A7 for minimum.
6	39.75 MC			A8 for minimum.
7	45.3 MC	Connect generator and VTVM same as in step 1.	Use 3 volt bias supply.	Readjust A1, A2 and A3 for maximum.
8	43.5 MC	Connect VTVM as above. Disconnect antenna terminals jumper, connect generator high side to antenna terminals; full output may be required.	Use 1½ volt bias supply and set Channel selector to 2 or other low channel.	A18 for minimum.
9	To insure correct IF alignment, make the "IF Response Curve Check" given below.			

IF RESPONSE CURVE CHECK

Receiver Controls and Bias Supply	Sweep Generator	Marker Generator	Oscilloscope	Instructions
Set **Channel Selector** on channel 12 or an unassigned high channel. **Contrast** control fully to the left. Connect negative of 3 volt bias supply to test point "T"; positive to chassis.	Connect high side to top of 6U8 mixer-osc. special tube shield. Connect low side to chassis, see figure 11. Set sweep frequency to 43MC, and sweep width approximately 7MC.	If an external marker generator is used, loosely couple high side to sweep generator lead on top of tube shield, low side to bottom of tube shield. Marker frequencies indicated on IF Response Curve.	Connect to test point "V" through a decoupling filter. See figures 13 and 15. Marker pips on scope will be more distinct if a capacitor from 100 mmf to 1000 mmf is connected across the oscilloscope input.	Check curve obtained against ideal response curve in fig. 23. Note tolerances on curve. Keep marker and sweep outputs at very minimum to prevent overloading. A reduction in sweep output should reduce response curve amplitude without altering the shape of the response curve. If the curve is not within tolerance or the markers are not in the proper location on the curve, touch-up with IF slugs as instructed below. If curve changes shape with hand capacity, see "Alignment Hints" on page 22.

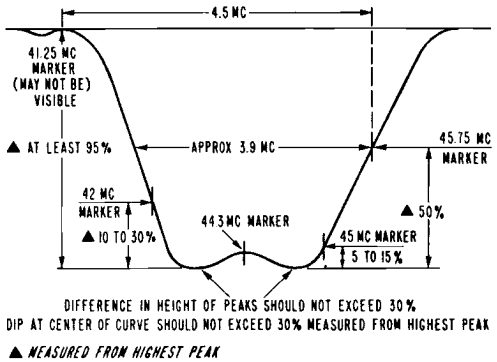


Figure 23. Ideal IF Response Curve.

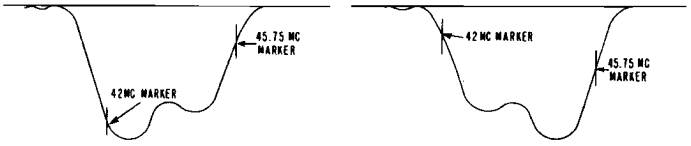


Figure 24. IF Response Curves, Incorrect Shape.

If it is necessary to adjust for approximate equal peaks, carefully adjust slug A5 (43.5 MC). It should not be necessary to turn slug more than one turn in either direction.

If the curve cannot be made to resemble the response curve shown at left, repeat all steps under "IF Amplifier and Trap Alignment" making sure that generator frequencies are accurate and adjustments are carefully made. If a satisfactory curve cannot be obtained after repeating these steps, it may be necessary to change IF amplifier tubes or check for a defective circuit component to be sure that each stage is operating properly.

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

Information on this page applies ONLY to 41 MC IF Chassis 21B3Z, 21D3Z and 21H3Z.

4.5 MC SOUND IF AND TRAP ALIGNMENT

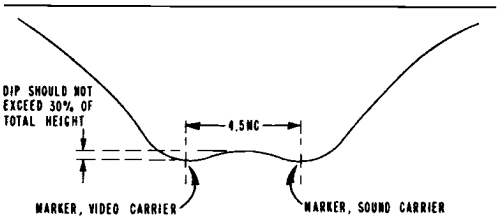
This procedure is identical for 21 MC and 41 MC IF Chassis. *See page* **25.**

VHF AMPLIFIER AND MIXER ALIGNMENT

See page 26 for VHF Amplifier and Mixer Alignment for 21 MC Chassis.

- Connect negative of 3 volt bias supply to AGC buss (test point "X"), positive to chassis.
- Connect sweep generator 300 ohm output to VHF antenna terminals. If sweep generator does not have a built-in marker generator, loosely couple a marker generator to the antenna terminals. To avoid distortion of the response curve, keep sweep generator output at a minimum, marker pips just barely visible.
- Connect oscilloscope to test point "W" on VHF tuner (figure 26). Keep scope leads away from chassis.
- Allow about 15 minutes for receiver and test equipment to warm up.

Step	Marker Gen. Freq. (MC)	Sweep Gen. Frequency	Instructions
1	193.25 MC (Video Carrier) 197.75 MC (Sound Carrier)	Sweeping Channel 10. See "Frequency Table".	Check for RF response curve below. Alternately adjust A13 and A14 (figure 26) as required to obtain equal peak amplitudes and symmetry consistent with proper bandwidth and correct marker location.
2	83.25 MC (Video Carrier) 87.75 MC (Sound Carrier)	Sweeping Channel 6. See "Frequency Table".	Check for RF response curve below. Adjust A15 as required to obtain curve having maximum amplitude and flat top appearance consistent with proper bandwidth and correct marker location. After completing adjustment, recheck adjustment of step 1.
3	Set the sweep generator to sweep the channel to be checked. Set the marker generator for the corresponding video carrier frequency and sound carrier frequency.		Check each channel operating in the service area for curve shown below. In general, the adjustment performed in steps 1 and 2 are sufficient to give satisfactory response curves on all channels. However, if reasonable alignment is not obtained on a particular channel, (a) check to see that coils have not been intermixed, or (b) try replacing the pair of coils for that particular channel, or (c) repeat step 1 for a weak high channel as a compromise adjustment to favor the particular channel. Repeat step 2 for the weak low channel to favor the particular channel. If a compromise adjustment is made, other channels operating in the service area should be checked to make certain that they have not been appreciably affected.



Full skirt of curve will not be visible unless generator sweep width extends beyond 10 MC.

Figure 25. RF Response Curve.

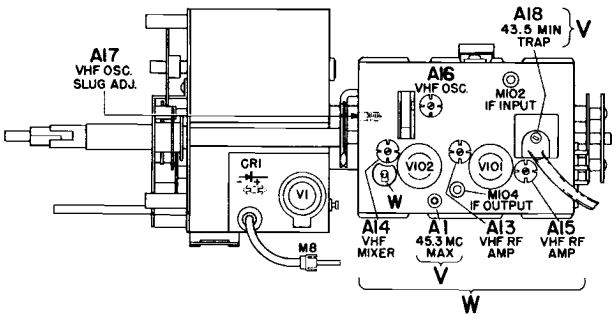


Figure 26. Top of VHF and UHF TV TUNER, Showing Adjustment Locations.

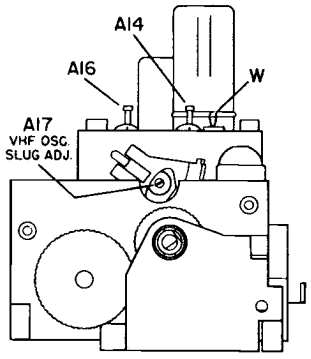


Figure 27. Front View of VHF Tuner.

OVER-ALL RF AND IF RESPONSE CURVE CHECK

This procedure is identical for 21 MC and 41 MC IF Chassis. *See page* **27.**

ADMIRAL (Continued)

VHF (21MC IF) 21A3Z, 21A3AZ, 21C3Z, 21G3Z CHASSIS
VHF-UHF (41MC IF) 21B3Z, 21D3Z, 21H3Z CHASSIS

Information on this pages applies ONLY to 41 MC IF Chassis 21B3Z, 21D3Z and 21H3Z.

IF PRE-AMPLIFIER ALIGNMENT AND RESPONSE CURVE CHECK

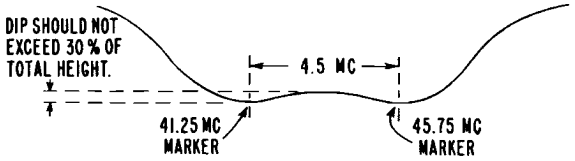
Important: This alignment is seldom required and should be made only if UHF reception is poor and after usual causes of poor reception have been checked.

- Set VHF Channel Selector at detent position midway between channels 5 and 6.
- Connect negative of 3 volt bias supply to AGC buss (test point "X"), positive to chassis.
- Remove CR1 (mixer crystal) from holder. Connect sweep generator high side through 100 ohm resistor to negative clip of mixer crystal socket, see figure 26. If sweep generator does not have a built-in marker generator, loosely couple a marker generator to the high side of sweep generator. To avoid distortion of the response curve, keep sweep generator output at a minimum, marker pips just barely visible.
- Connect oscilloscope to test point "W" on tuner (figure 26). Keep scope leads aways from chassis.
- Allow about 15 minutes for receiver and test equipment to warm up.
- Use a non-metallic alignment tool. If hollow core slugs are used, use alignment tool, part number 98A30-14.

Before proceeding, detune slug A2 exactly 3 turns counterclockwise. After completing this alignment, return slug A2 to its original setting by turning it exactly 3 turns clockwise.

Caution: Use extreme care to avoid damage to coils or slugs.

Step	Marker Gen. Freq. (MC)	Sweep Gen. Frequency	Instructions
1	45.75 MC (Video IF Carrier) 41.25 MC (Sound IF Carrier)	Set sweep at 43.5 MC sweep width 12 MC.	Adjust A19 to obtain maximum amplitude at center of curve. Alternately adjust A20 and A21 (figure 29) as required to obtain equal peak amplitudes and symmetry, consistent with flat top appearance, proper band width and correct marker location; see figure 28.
2	If curve cannot be made to resemble response curve, figure 28, check to be sure all instructions have been followed. Check tubes V101 and V102 and repeat alignment. **Important:** After replacing tubes, it may be necessary to check "VHF Amplifier and Mixer Alignment".		



Full skirt of curve will not be visible unless generator sweep width extends beyond 12 MC.

Figure 28. IF Pre-amplifier and UHF Tuner Response Curve.

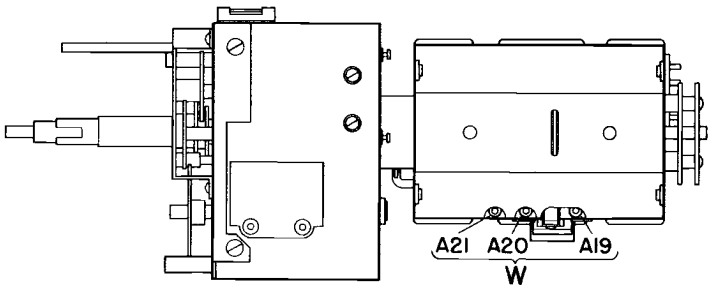


Figure 29. Bottom View of Tuners Showing IF Pre-amplifier Adjustments.

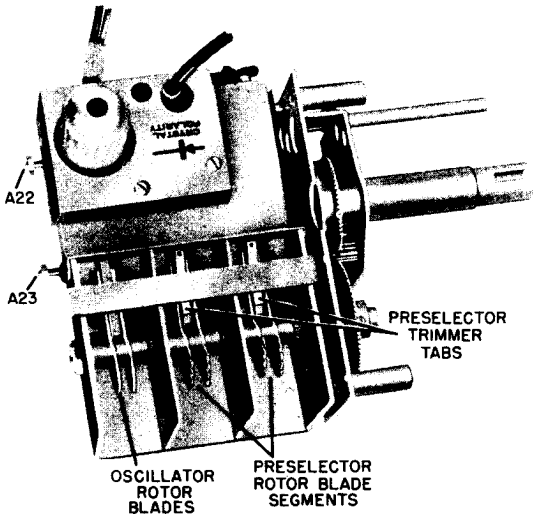


Figure 30. UHF Tuner Showing Alignment Locations.