

Admiral Models 19A11, 19A15 (Chassis 19A1)

Specifications

Picture Tube: 7", Electrostatic Deflection.

Input Impedance: 300 Ohm.

Intermediate Frequencies:

Video IF—25.75 MC.

Audio IF—21.25 MC.

Inter-Carrier Beat Audio, IF. 4-5Mc.

Power Consumption: Approximately 100 Watts.

OPERATING VOLTAGE

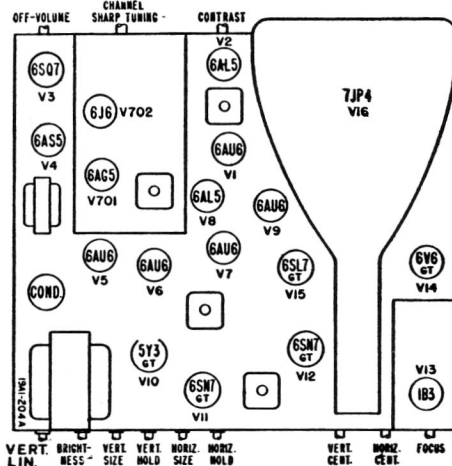
This receiver is designed to operate from a 117 volt, 25 cycle AC power outlet. **DO NOT ATTEMPT TO OPERATE THIS RECEIVER ON DIRECT CURRENT (DC).**

INTERLOCK PLUG

This set is provided with an interlock plug which disconnects AC line cord from chassis when cabinet back is removed.

Tube Complement

Symbol	Type	Circuit Function
V1	6AU6	Ratio Detector
V2	6AL5	Audio IF
V3	6SQ7	Audio Amplifier
V4	6AS5	Audio Output
V5	6AU6	1st IF
V6	6AU6	2nd IF
V7	6AU6	3rd IF
V8	6AL5	Video Detector and AGC
V9	6AU6	Video Amplifier
V10	5Y3GT	Low Voltage Rectifier
V11A	6SN7GT	Sync Separator
V11B		Vertical Oscillator
V12A	6SN7GT	Sync Amplifier
V12B		Horizontal Oscillator
V13	1B3GT/8016	High Voltage Rectifier
V14	6V6GT	High Voltage Oscillator
V15A	6SL7GT	Balanced Vertical Output
V15B		
V16	7JP4	7" Picture Tube
V701	6AG5	RF Amplifier
V702	6J6	Oscillator and Mixer



Tube locations, top view..

High Voltage Warning

Operating or servicing this television receiver with cabinet removed involves shock hazard. Exercise normal high voltage precautions while working with this set.

High voltages are present throughout the picture tube focusing and deflection circuits. No attempt should be made to make measurements from these points with ordinary test equipment.

Very carefully follow instructions given in this manual regarding location of test points for alignment, for taking voltage measurements, or in making oscilloscope waveform analysis. Do not connect test equipment across other points in the receiver unless you are thoroughly familiar with the circuit wiring and points at which high voltages are present.

Television Frequency Ranges

Channel Number	Channel Freq. (Mc)	Picture Carrier Freq. (Mc)	Sound Carrier Freq. (Mc)	Receiver R-F Osc. Freq. (Mc)
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

Alignment

GENERAL: Complete alignment of model 19A1 television chassis consists of the following individual procedures. Alignment should be performed in this sequence.

- a. IF Amplifier Alignment (Video and Audio IF).
- b. 4.5 MC Audio IF Alignment.
- c. Tuner RF and Mixer Alignment.
- d. Tuner High Frequency Oscillator Alignment.

Under normal use or operating conditions, tuner misalignment with age will be slight. The RF and mixer stage components as well as coil assemblies have been designed for stable, band-pass operation and under normal conditions will seldom require realignment. The HF oscillator, however, may require some slight readjustment, if the oscillator-mixer tube or individual channel snap-in coils have been replaced. See discussion under "94C8-1 Tuner Service."

IMPORTANT

Do not attempt alignment of the tuner until all other possible causes of trouble have first been investigated. Also, tuner alignment should not be attempted unless suitable test equipment, as listed under "Test Equipment," is available.

Test Equipment

To properly service this receiver it is recommended that the following test equipment be available:

RF Sweep Generator

18 to 30 MC range; 10 MC sweep width.
50 to 90 MC range; 10 MC sweep width.
170 to 225 MC range; 10 MC sweep width.
Output: adjustable; one volt minimum.
Output impedance: 300 ohms balanced to ground for RF ranges.

Marker Generator

18 to 30 MC frequency range.
50 to 90 MC frequency range.
170 to 225 MC frequency range.
Must be extremely accurate or have built-in crystal calibrator for checking accuracy of calibration.

Crystal Calibrator

Check points from 18 to 225 MC. Not required if marker or sweep generators have built-in calibration crystals.

Signal Generator

Accurate signal generator, range 3 to 225 MC, with low impedance output and calibrated output attenuator.

Oscilloscope

Standard oscilloscope, preferably with a wind band vertical deflection, vertical sensitivity at least .5 volt peak-to-peak per inch, and input calibrator.

Vacuum-Tube Voltmeter

Vacuum-tube voltmeter or 20,000 ohms per volt DC

meter. Preferably one with low range (3 volt) DC zero center scale.

Tuner Alignment Requirements

RF and MIXER: General minimum requirements for proper RF and Mixer alignment are to provide correct band width and for the response curve (figure 31) to be centered within the limit frequencies shown for each individual channel. (See chart on page 12 for the marker generator frequencies.) Consistent with proper band width and response curve symmetry, it is also necessary that maximum amplitude and flat top appearance be maintained.

RF and mixer coil windings (L701A, L701B, L702A, L702B) are self-tuned by the distributed and tube capacitances. Since the design of this tuner features replaceable channel snap-in coils, individual channel adjustments are not provided in RF and mixer alignment. Overall adjustment affecting all channels is made by screw adjustments A8, A9 and A10. See chart on page 12. This adjustment should be made on one of the high band channels, preferably channel 12. However, it can be made at any of the lower channels as a compromise adjustment in order to favor a particular channel having a weak signal.

If reasonable alignment cannot be effected on a particular channel, check with another set of coils marked for that particular channel. **If coils are at fault, replace pair of coils (L701 and L702) for that channel (see Parts List).** Before replacing coils, check to see that they have not been intermixed or have been located in wrong sequence in the turret. See figure 33 for correctly indexing coils. Coils are stamped with channel numbers or are RMA color coded.

IMPORTANT

Adjustments A8, A9 and A10 of step 1, "RF and Mixer Alignment", page 12, are overall adjustments affecting all channels.

HF Oscillator: The minimum requirement for correct high frequency oscillator alignment is that the oscillator frequency be adjusted so that the video RF carrier marker pip appears 6db (50%) below the peak of the Over-all RF, Mixer and IF Amplifier response curve. See figure 34. The sound RF carrier marker pip should appear at least 6db (95%) below the peak on the opposite side of the response curve. Ideal location of the sound marker pip is approximately 32db (97.5%) below the peak and may or may not be visible.

The need for oscillator adjustment of individual channels is determined by checking to see if the video carrier marker appears at the 50% point on the response curve (figure 34 when the Sharp Tuning Control C11 is tuned through the center of its range. If all or the majority of channels appear to be in need of oscillator

alignment, adjustment may sometimes be made in a single operation, by means of the overall oscillator screw adjustment A-11. Note that A-11 is an overall adjustment affecting all channels; do not use for alignment of

an individual channel. Oscillator slug adjustments A12 to A23 are to be used for alignment of individual channels.

IF Amplifier Alignment

- Caution: To avoid contact with high voltage wiring, turn set off when attaching test leads.
- Disconnect antenna from receiver.
- Before starting alignment, allow 30 minutes for receiver and test equipment to warm up.
- Alignment adjustments, connection points, and response curves are shown in figs. 28, 29, 30.
- Point "W" is the junction of R705 and R706.
- Point "X" is the junction of L8 and R31.
- Point "R" is the junction of R15, R18, C16.

Step	Signal Gen. Frequency	Connections	Instructions	Adjust
1	25.3 MC unmodulated	Signal Generator high side to point "W" on tuner, low side to chassis. VTVM (3 volt DC scale) between point "X" in chassis and chassis ground.	Remove one oscillator-mixer coil (6 terminal) section from turret of tuner. Rotate turret until open coil position is adjacent to contact points on tuner contact strip. Set contrast control full on.	A4 and A2 for maximum (keep reducing generator output to keep VTVM at approx. 1 volt.)
2	23.1 MC unmodulated	Same as above.	Same as above. Must use non-metallic screwdriver when adjusting A4.	A3 and A1 as in step 1.

- a. Disconnect Signal Generator and VTVM.
- b. Connect Oscilloscope between point "X" in chassis and chassis ground. Keep leads away from receiver.
- c. Connect Sweep Generator high side to point "W" on tuner, low side to chassis ground. Set Sweep Generator to sweep the IF pass band (20 to 30 MC).
- d. Loosely couple Marker Generator high side to the Sweep Generator lead connected to point "W" on tuner, low side to chassis ground.
- e. Check curve obtained against the ideal overall IF amplifier response curve shown in figure 28. If necessary, retouch (stagger tube) A1, A2, A3, and/or A4 as required.

3

IMPORTANT

To avoid distortion of the response curve (overloading the video detector) keep the Sweep Generator and Marker Generator outputs at a very minimum. Marker pips should be just kept barely visible. Connecting a 3-volt bias battery (negative to point R, positive to chassis) will allow greater signal input without distorting response curve.

It is important that marker pips be in the proper location on the response curve as shown in figure 28. Correct locations of 25.75 MC marker should be 6db below peak (50% point on slope of curve). The 22 MC marker should be at the opposite side of the response curve, located approximately 18db (85%) below the peak. The 21.25 MC marker should be located at least 26db (95%) below the peak. The ideal location of the 2.25 MC marker is approximately 32db (97%) below the peak and may or may not be visible.

Consistent with proper band width and correct location of markers, the response curve must have maximum amplitude, symmetry, and a flat top appearance.

4

Replace oscillator-mixer removed in step 1.

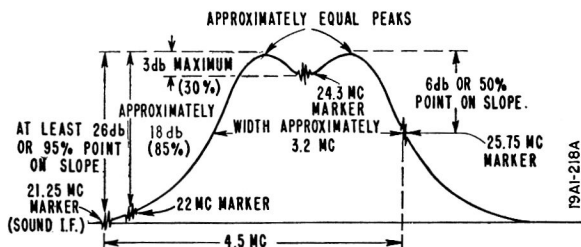


Figure 28. Overall IF Amplifier Response Curve.

4-5 Mc. Audio IF Alignment

- Caution: To avoid contact with high voltage wiring, turn set off when attaching test leads.
- Disconnect antenna from receiver.
- Before starting alignment, allow 30 minutes for receiver and test equipment to warm up.
- Alignment adjustments and connection points are shown in figures 29 and 30.
- Point "V" is pin No. 1 of V9, video amplifier.
- Point "Y" is pin No. 2 of V2, ratio detector.
- Point "Z" is junction of R8, R4 and C6 in ratio detector stage.

Step	Signal Gen. Frequency	Connections	Instructions	Adjust
<p>Before proceeding, be sure to check the signal generator used in alignment against a crystal calibrator or other frequency standards for absolute frequency calibration at the 4.5 MC alignment point required for this operation. Accuracy required within one kilocycle.</p> <p>If a frequency standard is not available for a 4.5 MC frequency check, it is recommended that touchup of zero setting adjustment A7 in step 2 be made, using a television signal rather than the 4.5 MC signal from a signal generator. This touchup adjustment should be made after checking (and aligning where necessary) the IF Amplifier, Tuner RF and Mixer, and HF oscillator.</p>				
1	4.5 MC unmodulated	Signal generator high side to point "V" thru .01 cond. VTVM (3 volt DC scale) to point "Y".	Use 3 volt scale on VTVM. Keep VTVM leads well separated from signal generator and chassis wiring. A non-metallic screwdriver will be required for aligning slug adjustment A5.	A5 and A6 for maximum (keep reducing generator output to keep VTVM at approx. 1 volt).
2	4.5 MC unmodulated	Signal generator high side to point "V" thru .01 cond. VTVM to point "Z".	Use 3 volt zero center scale on VTVM, if available. Keep VTVM leads well separated from signal generator and chassis wiring. A non-metallic screwdriver will be required for aligning slug adjustment A7.	A7 for zero voltage on VTVM (the correct zero point is located between a positive and a negative maximum).

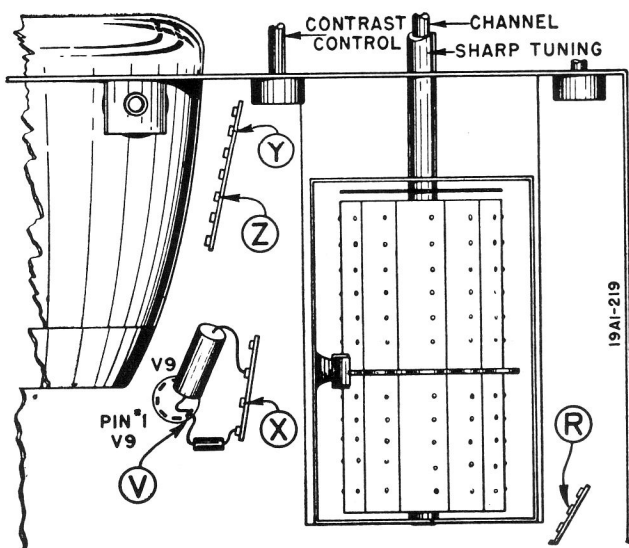


Figure 29. Bottom View Chassis showing Alignment Connection Points.

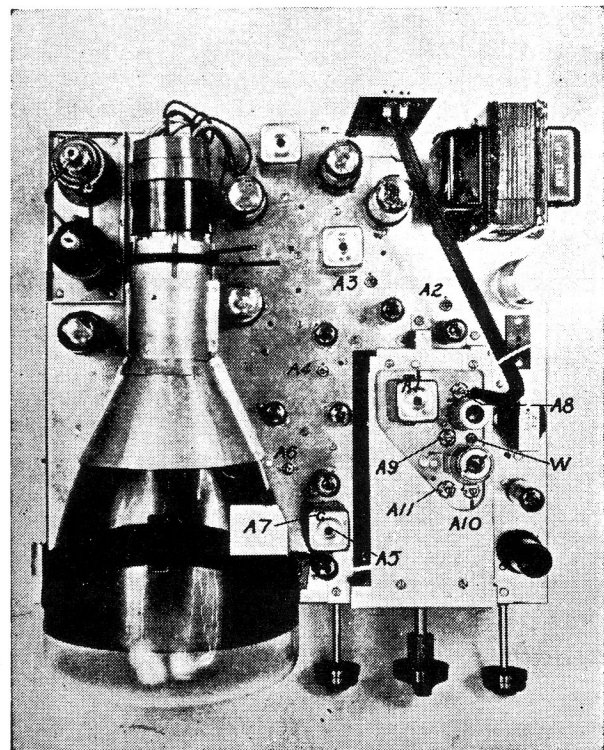


Figure 30. Top View of Chassis showing Alignment Adjustment Locations.

RF and Mixer Alignment

See discussion under "TUNER ALIGNMENT REQUIREMENTS" on page 2.

- Caution: To avoid contact with high voltage wiring, turn set off when attaching test leads.
- Disconnect antenna from receiver.
- Before starting alignment, allow 30 minutes for receiver and test equipment to warm up.
- Alignment adjustments, connection points, and response curves are shown in figs. 29, 31, 32.
- Point "W" is the junction of R705 and R706.
- Connect sweep generator to antenna terminals.
- Loosely couple marker generator to antenna terminal (to obtain marker pips of video and sound RF carriers). To avoid distortion of the response curve, keep marker generator output at a minimum, marker pips just barely visible.
- Connect oscilloscope through 10,000 ohm resistor to point "W". Keep oscilloscope leads away from chassis.
- Set contrast control full on (clockwise).
- Connect wire jumper across R15 (grid resistor of V5).

Step	Marker Gen Freq. (MC)	Sweep Gen. Frequency
1	*205.25 **209.75	Sweeping Channel 12
2	211.25 215.75	13
3	199.25 203.75	11
4	193.25 197.75	10
5	187.25 191.75	9
6	181.25 185.75	8
7	175.25 179.75	7
8	83.25 87.75	6
9	77.25 81.75	5
10	67.25 71.75	4
11	61.25 65.75	3
12	55.25 59.75	2
13	Remove wire jumper from across R15 (grid resistor of V5).	

Adjust

Check for curve resembling RF response curve shown in fig. 31. If necessary, adjust A8, A9 and A10 as required. Curve must have maximum amplitude, symmetry, flat top, and be centered within marker limit frequencies.

Check each channel for curve resembling RF response curve shown in figure 31. In general, the adjustment performed in step 1 is sufficient to give satisfactory response curves on all channels. (See discussion under "TUNER ALIGNMENT REQUIREMENTS" on page 9 of this manual.

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 the weak channel as a compromise adjustment to favor this particular channel. If a compromise adjustment is made, other channels should be checked to make certain that they have not been appreciably affected.

Figure 31. R.F. Response Curve

* Picture Carrier Frequency (MC)

** Sound Carrier Frequency (MC)

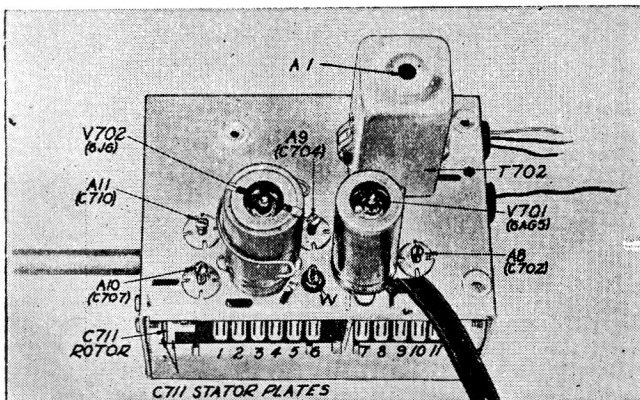


Figure 32. 94C8-1 Tuner, Top View

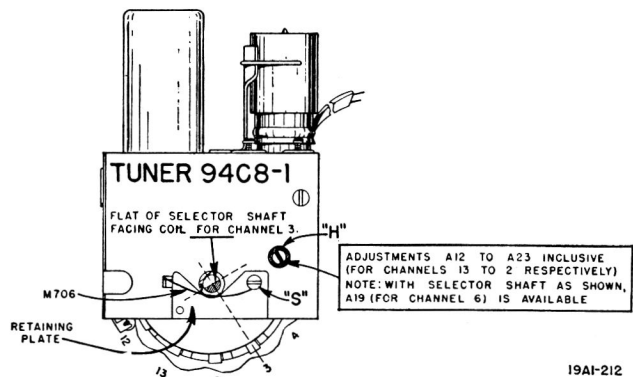


Figure 33. 94C8-1 Tuner, Front View

HF Oscillator Alignment

See discussion under "TUNER ALIGNMENT REQUIREMENTS" on page 2.

- Caution: To avoid contact with high voltage wiring, turn set off when attaching test leads.
- Disconnect antenna from receiver.
- Before starting alignment, allow 30 minutes for receiver and test equipment to warm up.
- Alignment adjustments, connection points, and response curve shown in Figs. 29, 32, 33, 34.
- Connect sweep generator to antenna terminals.
- Loosely couple marker generator to antenna terminals (to obtain marker pips of video and sound RF carriers). To avoid distorting response curve (overloading the video detector), keep the sweep generator output and the marker generator output at a very minimum. The marker pips should just be barely visible. Connecting a 3-volt bias battery (negative to point "R" positive to chassis) will allow greater signal input without distorting response curve.
- Connect oscilloscope between point "X" in chassis and chassis ground. Keep oscilloscope leads away from chassis.
- Point "X" is the junction of L8 and R31 in video detector stage.
- Set Contrast control full on (clockwise).
- Set Sharp Tuning Control C711 for electrical center as follows: Turn Sharp Tuning Control counter-clockwise until the stop tab of rotor of C711 engages stop screw "S". At this setting the Sharp Tuning Control is at electrical center and the cut-out in the rotor dielectric disc will make slug adjustments A12 to A23 individually accessible by rotating the turret.
- Use a NON-METALLIC alignment screwdriver with a 1/8-inch blade.
- If HF oscillator slugs "fall into" coil form, remove the channel coil, move the slug retaining spring aside, and tap the coil assembly until the slug slips forward. Set the coil retaining spring into position; it should rest firmly against the slug. See figure 24.

Step	Marker Gen. Freq. (MC)	Sweep Gen. Frequency	Instruction
1			Before aligning the HF oscillator, check the IF response curve (figure 28) as indicated in step 3 of the IF Amplifier Alignment. The IF's must be accurately aligned before correct oscillator adjustment can be made. Retouch RF adjustments if necessary.
2	*211.25 **215.75	Sweeping Channel 13	Check to see if the video carrier marker appears at the 50% point on the response curve (figure 34) when the Sharp Tuning Control C711 is tuned through the center of its range. If adjustment is needed, check to see whether mis-alignment is apparent on channel 13 only or also exists on other channels. If overall adjustment is required, adjust A-11. Otherwise adjust A12.
3	205.25 209.75	12	<p>Check all channels individually for proper marker location. If over-all adjustment has been made, it may not be necessary to make any further adjustments. If necessary, however, make individual HF oscillator adjustments (A12 to A23) for individual channels by adjusting the slug in the HF oscillator section (L702C) of coil L702 for the particular channel.</p> <div style="text-align: center;"> </div>
4	199.25 203.75	11	
5	193.25 197.75	10	
6	187.25 191.75	9	
7	181.25 185.75	8	
8	175.25 179.75	7	
9	83.25 87.75	6	
10	77.25 81.75	5	
11	67.25 71.75	4	
12	61.25 65.75	3	
13	55.25 59.75	2	

Figure 34. Overall RF Mixer and IF Amplifier Response Curve.

* Picture Carrier Frequency (MC)

** Sound Carrier Frequency (MC)

ADMIRAL MODELS 19A11, 19A15 (19A1 Chassis)

TUNER 94C8-1

TUNER SETTING SELECTS
PAIR OF COILS L701, L702 FOR
CHANNEL DESIRED.

