7. PARTS LIST/TUNE-UP INFO

7.1 Parts List

The transmitter, can be subdivided as follows:

UHF Exciter Tray:
-Delay equalizer board
-Composite 4.5 MHz filter board
-4.5 MHz Bandpass filter board
-IF carrier oven oscillator board
-Sync tip clamp modulator board
-ALC board
-IF phase corrector board
-UHF upconverter board
-Channel oscillator board
-x8 multiplier board
-Transmitter control Board
-Power supply board

Variable Phase/Gain Tray:
-Variable gain/phase assembly
-Metering board

Amplifier Tray:
-Variable gain/phase board
-1 watt UHF amplifier board
-UHF filter
-Single stage amplifier assembly, class A
-Coupler board assembly
-Dual stage amplifier assembly, class AB
-4 Way splitter assembly
-Dual stage amplifier assemblies, class AB
-4 Way combiner assembly
-Circulator
-Dual peak detector board
-Amplifier protection board
-Amplifier control board
-Switching power supply

7.2 Tune-up Information

If the (Optional) 4.5 MHz Composite Input Kit is purchased, the UHF Exciter Tray is capable of operation using either the 4.5 MHz Composite Input or the Baseband Audio and Video Inputs. The Kit adds to the UHF Exciter the (A24) Composite 4.5 MHz Filter Board (1227-1244) and the (A25) 4.5 MHz Bandpass Filter Board (1265-1307). The 4.5 MHz generated by the Aural IF Synthesizer Board is not used when the 4.5 MHz Composite Input Kit has the 4.5 MHz Intercarrier Signal generated by the 4.5 MHz Composite Input selected. The Composite 4.5 MHz Filter Board and the 4.5 MHz Bandpass Filter Board are not used when the 4.5 MHz Composite Input Kit has the 4.5 MHz Intercarrier Signal generated by the Baseband Video and Audio Inputs with Baseband Selected.

7.2.1 UHF Exciter Tray

The Exciter Tray has been factory tuned and should need no alignment to achieve normal operation. To align the UHF Exciter for 4.5 MHz Composite Input, apply the 4.5 MHz Composite Input, with the Test Signals applied as needed, to the Video Input Jack (J1) located on the rear of the Tray and select 4.5 MHz Composite Input by removing the Baseband Select from J7-6 & J7-7 on the rear of the Tray.

To align the UHF Exciter using Baseband Video and Audio Inputs, apply the Baseband Video, with the Test Signals applied as needed, to the Video Input Jack (J1 or J2) and the Baseband Audio to the proper Baseband Audio Input located on the rear of the Tray. For Balanced Audio Input, connect to TB1-1(+), TB1-2(-) & TB1-3(GND) and for Composite/Stereo Audio, connect to J3 or J13 and connect a Baseband Select from J7-6 & J7-7 on the rear of the Tray.

To align the UHF Exciter Tray using the Combined IF output of the Receiver Tray apply the Combined IF with the Test Signals applied as needed, to the Combined IF Input Jack (J6) located on the rear of the Tray and remove a Modulator Select from J11-10 & 28 on the rear of the Tray.

7.2.1.1 (A6) Delay Equalizer Board (1227-1204)

This board may not be present in your Tray. If present, the Jumper W1 on J5 on the Sync Tip Clamp/Modulator Board must be in the Enable position between Pins 2 & 3.

This board has been factory tuned and should not be re-tuned without the proper equipment.

1. Connect a SinX/X test signal into Jack J1-2 on the Delay Equalizer Board.

2. Monitor the Video Output of the Board at the Video Sample Jack J2 with a Video Measuring Set VM700 adjusted to measure group delay.

3. Tune the four stages of the Board using the variable inductors (L1-L4) and potentiometers (R7, R12, R17 & R22) until the signal attains the FCC Group Delay Curve. The stages are arranged in order of increasing frequency. Adjust R29 as needed to attain the same level out of the board as into the board.

7.2.1.2 (Optional) (A24) Composite 4.5 MHz Filter Board (1227-1244)

This Board will only function properly with a 4.5 MHz Composite Input Signal and also with the 4.5 MHz Composite Input selected.

1. Connect the test signal from an Envelope Delay Measurement Set to the Video Input of the Tray at J1 or J2.

2. Connect an Oscilloscope to Jack J7, Video Out, between J7 Center Pin and Pin 1 or 3 Ground. Adjust C21, Frequency Response, if needed for best frequency response. Adjust R32, Video Gain, for a signal level of 1 Vpk-pk on the Oscilloscope.

The Output at J6 and J7 of the Board should be Video Only, no 4.5 MHz Aural Subcarrier.

7.2.1.3 (Optional) (A25) 4.5 MHz Bandpass Filter Board (1265-1307)

This Board will only function properly with a 4.5 MHz Composite Input Signal and also with the 4.5 MHz Composite Input selected.

1. Adjust the Filter with L2, C3, L4 and C7 for a frequency response of no greater than ±.3 dB from 4.4 to 4.6 MHz.

2. Adjust C19 for an over-all peak to peak variation of less than ±.3 dB from 4.4 MHz to 4.6 MHz.

3. Recheck the Frequency response, it may have changed with the adjustment of the Envelope Delay. Retune if needed.

7.2.1.4 (A7) IF Carrier Oven Oscillator Board (1191-1404)

1. While monitoring J3 with a spectrum analyzer, observe the 45.75 MHz Visual IF (Typical +5 dBm).

2. Connect a frequency counter to J3 and adjust C17 for 45.750000 MHz.

3. Connect a frequency counter to J1 and check for 50 kHz, which is the Aural Phase Lock Loop Reference.

7.2.1.5 (A5) Sync Tip Clamp/Modulator Board (1265-1302)

1. Determine if Jumper W4 on Jack J3 is present. Jumper W4 terminates the video input into 75Ω. Remove Jumper W4 if Video Loop-Thru is required on the rear chassis at Jacks J1 and J2.

2. Set the controls R20, the White Clip, R24, the Sync Clip, and R45, the Sync Stretch Cut In, to their full Counter Clockwise (CCW) position. Set R48, the Sync Magnitude, fully CW.

3. Place the Jumper W7 on Jack J4 to the Clamp Off, Disable, position.

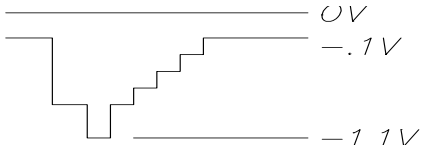
4. Connect a 5 Step Staircase Video Test Signal to the input of the Transmitter.

5. Monitor TP2 with an oscilloscope. Adjust R12, the Video Gain Pot, for 1 Vpk-pk.

6. Change the Video Input Test Signal to a multiburst test pattern. While monitoring TP2, adjust C8 and R32 for a flat frequency response. Change the input video test signal back to the 5 Step Staircase.

7. Monitor TP2 with an oscilloscope. Adjust the pot R41, Manual Offset, for a blanking level of -0.8 VDC. The waveform below should be observed. Move the Jumper W2 on J4 to the Clamp Enable position. Adjust the pot R152, Depth of Modulation, for a Blanking Level of -0.8 VDC.

The following waveform should be observed:



Note: The preceding waveform represents the theoretical level for proper modulation depth. Step 9 below details setting the modulation depth by the use of a television demod or a zero spanned spectrum analyzer tuned to the visual IF frequency.

8. This Test Set-Up is for the adjustment of the Depth of Modulation and ICPM at IF:

   A. Remove the Cable now on J18 and connect the Double Sideband 45.75 MHz Visual IF signal from J18 to a 10 dB Splitter/Coupler. Connect the Coupled Port of the Splitter/Coupler to the RF Input of a Television Demodulator. Connect the Direct Port to a Spectrum Analyzer.

   B. Connect the 75Ω Video Output of the Demodulator to the Video Input of a waveform monitor. For ICPM measurements, also connect the Quadrature Output of the Demodulator to the Horizontal Input of the waveform monitor using a 250 kHz Low Pass Filter. (Alternately, an oscilloscope can be used in place of a waveform monitor).

   C. Set the controls of the demodulator to the following:

Detector Mode...Cont	Auto.....Sync
Sound Trap.....In	Audio Source....Split
Zero Carrier...On	De-Emphasis.....In

9. Move the Jumper W7 on J4 to the Clamp Disable position. Re-adjust the pot R41, Manual Offset, for the correct depth of modulation by observing the demodulated waveform on the waveform monitor or on the spectrum analyzer set to zero span.

10. Check the demodulated video for proper sync to video ratio (sync is 28.6% of the total white video signal). If sync stretch is needed, adjust R45, Sync Stretch Cut In, until sync stretch occurs. Adjust R48, Sync Stretch Magnitude, for the proper amount of stretch. Readjust R41, Manual Offset, if needed, for correct depth of modulation.

11. Move the Jumper W7 on J4 to the Clamp Enable position. Re-adjust the pot R152, the Depth of Modulation, for the correct depth of modulation.

12. Set the waveform monitor to display ICPM. Preset R53 full CCW and adjust C78 for the greatest effect at WHITE on the ICPM Display, then adjust R53 for minimum ICPM.

13. Recheck the Depth of Modulation and adjust R152, Depth of Modulation, if necessary.

14. Adjust the pot R70 for a level of approximately -10 dBm on a spectrum analyzer at J18.

15. Remove Video. Place the Front Panel Meter in the video position and while monitoring the meter adjust pot R144, Zero adjust, for a reading of zero.

16. Replace the input video test signal (the 5 Step Staircase). Turn the Front Panel Meter to the video position and adjust R20 on the Transmitter Control Board for a reading of 100 (10 on the 0-10 scale). This board has no sync metering.

17. Reconnect the Plug to J18 and move the spectrum analyzer test cable to the 41.25 MHz IF Output Jack J16. Tune C59 and L17-L20 to maximize the 41.25 MHz Aural IF signal and minimize the out-of-band products. Adjust pot R97 for -20 dBm at J16.
18. Reconnect the Plug to J16 and move the spectrum analyzer test cable to the IF Output Jack J20. Preset R62, the Visual IF Gain Pot, to the middle. Insert a multiburst test signal into the Transmitter and observe the visual frequency response with the spectrum analyzer set at 1 dB/division. Tune R63 and C30, the IF Frequency Response Adjustments, for a flat frequency response (±0.5 dB).

19. While still monitoring J20 with a spectrum analyzer, re-adjust R62, Visual IF Gain, for a 0 dBm visual output level. Adjust R85, A/V Ratio, for a minus 10 dB Aural to Visual Ratio or to the A/V Ratio desired. Reconnect the Plug to J20.

20. Using an input video test signal (the 5 Step Staircase) with 100 IRE white level, monitor TP2 with an Oscilloscope. Set the control R24, the Sync Clip, just below the point where sync clipping begins to occur. Similarly, set R20, the White Clip, to the point just below where the white video begins to clip. **Notice:** This procedure should be checked after System Set Up or if linearity problems occur.

7.2.1.6 (A4) Aural IF Synthesizer Board, 4.5 MHz (1265-1303)

1. Test Equipment Set-Up:

   A. Connect the 600Ω Balanced Audio Output from an audio oscillator to the Balanced Audio Input terminals of the Tray at TB1-1 (+), TB1-2 (-) and TB1-3 (Ground) located on the rear chassis.

   B. Connect the Combined IF Output at J21 (IF Sample) on the Clamp Modulator Board, to the Input of an IF Splitter. Connect one output of the Splitter to the video demodulator and the other output to the spectrum analyzer.

   C. Connect a short cable at the front of the demodulator from the RF OUT Jack to the IF IN Jack.

   D. Connect a cable from the 600Ω Audio Output Jack of the demodulator to the input of an Audio Distortion Analyzer.

2. Set the output frequency of the audio oscillator to 400 Hz and the output level to +10 dBm.

3. Center the Aural Carrier on the spectrum analyzer with the Spectrum Analyzer set to the following:

   FREQUENCY/DIVISION .... 10 kHz
   RESOLUTION BANDWIDTH..... 3 kHz
   TIME/DIVISION .. .. 50 msec
   TRIGGER .... Free run

   A. Adjust L5 for approximately +3.5 VDC at TP2.

   B. The Green LED DS1 should be illuminated, indicating a locked condition. If not, retune L5 for a locked condition.

4. Adjust R13, Balanced Audio Gain, on the Aural IF Synthesizer Board for ±25 kHz deviation and Check the distortion on the aural distortion analyzer. (S/B =< 0.5%)

5. Disconnect the 600Ω Balanced Audio Input to the Tray. Connect a 75Ω Stereo Audio Input (400 Hz @ 1 Vpk-pk) to the Composite Audio Input Jack J3, located on the rear of the Tray. Follow the procedure in the Stereo Generator Instruction Manual for matching the level of the generator to the Exciter. R17 adjusts the Composite Audio Gain.

6. Check the distortion level on the distortion analyzer. (S/B =< 0.5%)

Begin Here, for the Alignment of UHF Exciter Tray with the Combined IF from Receiver Tray Selected, which is Modulator Select Not Present at J11-10 & 28 or continue the Alignment for Internally Generated IF Selected, which is the Modulator Select Present at J11-10 & 28.

7.2.1.7 (A8) ALC Board (1265-1305) (Part 1 of 2)

The following details the meaning of each LED of the ALC Board (A8) when illuminated.

DS1 - Red LED, Indicates an abnormally low IF signal level is present at IF input connector J1.
DS2 - Red LED, Indicates that the ALC circuit is unable to maintain the signal level requested by the ALC reference, usually due to excessive attenuation in the linearity, or the IF Phase Corrector signal path, or the Jumper W3 on J6 is in Manual Gain.
DS3 - Red LED, Indicates a Video Loss Fault.
DS4 - Red LED, Indicates a Mute Command is present.
DS5 - Green LED, Indicates the output from the Modulator is selected as the input to the board.

1. To align the ALC Board, preset the following controls in the UHF Exciter Tray:

   <u>ALC Board (1265-1305)</u>

   Jumper W1 on J4 to Disable, between Pins 2 & 3. (to disable linearity correctors)
   Jumper W3 on J6 to Manual, between Pins 2 & 3. (for manual gain control)
   R87 the Manual Gain Pot adjusted to mid-range

   <u>IF Phase Corrector Board (1227-1250)</u>

   W2 on J9 in Phase Correction Enable
   W3 on J10 in Amplitude Correction Disable.

2. The combined IF output of the Sync Tip Clamp Modulator Board is cabled to Jack J32 of the ALC Board. Remove J32 from the board, and observe that DS1, Input Fault, is illuminated. Reconnect J32 and observe that DS1 is extinguished.

3. Jumper W3 on J6 should be in the MANUAL position, monitor Jack J3 with a spectrum analyzer.

4. With a multiburst video signal present, tune C4 for flat frequency response ±0.5 dB.

5. Before proceeding with Part 2 of the ALC Board Alignment, check the IF Phase Corrector Board (1227-1250) for proper functioning.

7.2.1.8 (A9) IF Phase Corrector Board (1227-1250)

Refer to the System Alignment Procedure for the set up of the IF Phase Corrector Board. The signal level into the board should be approximately the same as the output of the board.

The IF Input Jack of the IF Phase Corrector Board is fed from the J3 IF O/P Jack of the ALC Board (A8).
The IF Output Jack of the IF Phase Corrector Board is fed to the J7 IF I/P Jack of the ALC Board (A8).

7.2.1.9 (A8) ALC Board, NTSC (1265-1305) (Part 2 of 2)

1. Input a multiburst video test signal. Connect a spectrum analyzer to J11. Tune C63 for a flat frequency response ±0.5 dB.

2. Move the OPERATE/STANDBY switch located on the Front Panel to the OPERATE position.

3. Place Jumper W3 on Jack (J6) in the Manual Mode and adjust R87 for 0.8 Volts at TP4.

4. Place Jumper W3 on J6 in the Auto Mode and adjust the Front Panel Power Adjust control A20 full clockwise (CW). If the Optional Remote Power Raise/Lower Kit is present, then adjust Switch S1 on the Board to maximum voltage at TP4. Adjust R74, the Range Adjust, for 1 Volt at TP4.

5. Adjust the Front Panel Power Adjust control A20 for 0.8 VDC at TP4. If the Optional Remote Power Raise/Lower Kit is present, adjust Switch S1 on the Board to mid range of its travel, then adjust the Front Panel Power Adjust control (A20) for 0.8 VDC at TP4.

6. Disconnect the plug now on J12 (IF Output) and monitor with a spectrum analyzer. Verify an output of approximately 0 dBm. Adjust R99 if needed to increase output level. If less output level is needed, move the Jumpers J27 and J28 to Pins 2 and 3, then adjust R99 as needed. Reconnect J12.

7. Move W2 on J5 to the Cutback Enable position. Remove the input video signal and verify the output of the Transmitter drops to 25%. Adjust R71, the Cutback Level, if necessary. Restore the input video.

8. **Notice**: This Step affects the Response of the entire Transmitter. Connect a video sweep signal to the input of the Tray. Monitor the output of the System with a spectrum analyzer. Adjust C71 with R103 and C72 with R106 as needed to flatten the response. C71 and C72 adjust for the frequency of the Correction Notch being applied to the Visual response of the Transmitter. R103 and R106 are used to adjust the Depth and Width of the Correction Notch.

9. Refer to the System Alignment Procedure for the set up of the Linearity Correctors. Controls R13, R18, and R23, the Magnitude controls, should be set full CW. Controls

R34, R37 and R40 are the linearity Cut In adjustments.

7.2.1.10 (A11) UHF Upconverter Board (1265-1310)

W1 on J10 in Manual. R10 is a gain control which is adjusted to give approximately +17 dBm Output at J5 of the Board with 0 dBm of IF into it.

7.2.1.11 (A14-A1) Channel Oscillator Board (1145-1201)

This Board is mounted in (A14) the Channel Oscillator Assembly (1145-1202).

1. Connect the main output of the Channel Oscillator (J1) to a spectrum analyzer, tuned to the crystal frequency, and peak the tuning capacitors C6 and C18 for maximum output. Tune L2 and L4 for maximum output. The output level should be about +5 dBm. The Channel Oscillator should maintain an oven temperature of 50° C.

   If a spectrum analyzer is not available, connect a DVM to TP1 on the x8 Multiplier Board. Tune capacitors C6 and C18 for maximum voltage, then tune L2 and L4 also for maximum voltage output at TP1.

2. Connect the sample output of the Channel Oscillator (J2) to a suitable counter and tune C11, Coarse Adjust, and C9, Fine Adjust, to the crystal frequency. Do Not Re-peak C6, C18, L2 or L4 because this may change the output level.

   NOTES: While adjusting C9 and C11 to the crystal frequency, the peak voltage monitored at TP1 of the x8 Multiplier Board should not decrease. If a decrease does occur, a problem with the crystal is possible. Contact ITS Corp. Field Support for further instructions.

   If the VCXO Board (1145-1204) in the VCXO Assembly (1145-1206) is used, the C9 Fine Frequency Adjust is not located on the VCXO Board it is located on the FSK w/EEPROM Board by using R9.

3. Reconnect the Main Output (J1) of the Channel Oscillator to the Input (J1) of the x8 Multiplier.

7.2.1.12 (A15-A1) x8 Multiplier Board (1227-1002)

The Board is mounted in a x8 Multiplier Enclosure Assembly (1227-1240).

During Normal operation, the Green LED DS1, which can be seen through the access hole in the Enclosure Assembly, will be lit to indicate that the L.O. is present at the output of the x8 Multiplier Board.

1. Connect a Spectrum Analyzer to the Output Jack (J2) of the board.
2. Tune C4, C6, C10, C12, C18 and C20 for maximum output.
   Readjust all the Capacitors to minimize the seventh and the ninth harmonics of the Channel Oscillator Frequency. They should be at least -30 dB down, without affecting the x8 Multiplier Output.

If a Spectrum Analyzer is not available a DC voltmeter can be used as follows but the harmonic frequencies must be minimized to prevent interference with other Channels.

3. While monitoring each test point with a DC voltmeter, maximize each test point by

tuning the broadband multipliers in sequence.

4. Monitor TP1 with a DVM and tune C4 for maximum. (Typical 0.6 VDC)
   Monitor TP2 and tune C6 and C10 for maximum. (Typical 1.2 VDC)
   Monitor TP3 and tune C12 and C18 for maximum. (Typical 2.0 VDC)
   Monitor TP4 and tune C20 for maximum.
   Re-peak C12 and C10 while monitoring TP4. (Typical 3.5 VDC)
   Typical output level is +15 dBm.

7.2.1.13 (A17) Transmitter Control Board (1245-1101)

The board has calibration and fault threshold adjustments which are set up during System alignment, refer to the System Section for Calibration of the Front Panel Meter and the set up of the fault thresholds.

7.2.1.14 (A3) +12VDC(4A)/-12VDC(1A) Power Supply Board (1265-1312)

The board has no adjustments.

DS1 will be lit if a +12 VDC output is connected to J6. DS2 will be lit if a +12 VDC output is connected to J3. DS3 will be lit if a +12 VDC output is connected to J4. DS4 will be lit if a +12 VDC output is connected to J5. DS5 will be lit if a -12 VDC output is connected to J7 and J8.

This completes the Detailed Alignment Procedure for the UHF Exciter Tray.

7.2.2 Variable Phase/Gain Tray

This tray does not require a detailed alignment procedure.

7.2.3 UHF Amplifier Tray

The Tray has been adjusted at the factory to meet all specifications, including Phase Adjustment with the other UHF Amplifier Trays in the Transmitter and should not need adjusted to attain normal operation. During adjustments of the Amplifier Boards, S1 on the Amplifier Control Board should be in the Manual Gain position. Normal operation of the Tray is in the Auto position.

7.2.3.1 (A2-A1) Variable Gain/Phase Board

The board is mounted in (A2) the Variable Gain/Phase Enclosure.

This board contains no adjustments and has an AGC adjustable gain of 0 - 20 dB.

7.2.3.2 (A3-A1) 1 Watt UHF Amplifier Board

The board is mounted in (A3) the 1 Watt UHF Amplifier Enclosure.

This board has approximately 10 dB of gain and contains no adjustments.

7.2.3.3 (A1) UHF Filter

Apply a multiburst test signal to the Transmitter. Monitor J2 with a Spectrum Analyzer and tune C1 and C3 for peak output with a flat frequency response.

7.2.3.4 (A4-A1) Single Stage Amplifier Assembly, Class A

Made from the Generic Single Stage Amplifier Board, Class A w/Frequency Determining

Kit.

This board operates Class A and has a gain of approximately 11 dB. The Bias of the Transistor is set by the on board biasing circuit. Adjust R6 for 5 Amps of idle current, no RF Drive applied. Connect a Voltage Meter across E1 and E2 on the Amplifier Protection Board and switch S1 to the I1 Position and adjust R6 for a reading of 50 mV. Connect a Sweep Test Signal to J1 the RF Input Jack of the UHF Amplifier Tray and monitor the output of the Board at J2 with a padded input Spectrum Analyzer. Tune Capacitors C5 for peak output then tune C6 for peak output power with a flat frequency response at J2.

7.2.3.5 (A4-A2) Coupler Board Assembly

This board contains no adjustments.

7.2.3.6 (A4-A3) Dual Stage Amplifier Assembly, Class AB

Made from the Generic Dual Stage Amplifier Board, Class AB w/Frequency Determining Kit.

This board operates Class AB and has a gain of approximately 9 dB. The Biases of the Transistors are set by the on board biasing circuits. Adjust R106 and R206 for 300 milliamps of idle current per side, no RF Drive applied. Connect a Voltage Meter across E1 and E2 on the Amplifier Protection Board and switch S1 to the I3 Position and adjust R106 for a reading of 3.0 mV. Switch S1 to the I2 Position and adjust R206 for a reading of 3.0 mV. These transistors may have 600 mA of bias depending on the linearity of Tray. Connect a Sweep Test Signal to J1, the RF Input Jack of the UHF Amplifier Tray, and monitor the output of the Board at J2 with a padded input Spectrum Analyzer. Tune Capacitors C105 and C205 for peak output, then tune C119 and C219 for peak output with a flat frequency response and minimum current at J2.

7.2.3.7 (A5-A1) 4 Way Splitter Assembly

This board contains no adjustments.

7.2.3.8 (A5-A2, A5-A3, A5-A4 & A5-A5) Dual Stage Amplifier Assy's, Class AB

Each Board is made from a Generic Dual Stage Amplifier Board, Class AB w/Frequency Determining Kit.

These boards Operate Class AB and have a gain of approximately 9 dB. The Idling Current for each of the Transistors is set to 300 mA.

<u>To adjust the Idling Currents, no RF applied to the Tray, of the Devices on (A5-A2):</u>
Connect a Voltage Meter across E1 and E2 on the Amplifier Protection Board and switch S1 to the I5 Position and adjust R106 for a reading of 3.0 mV. Switch S1 to the I4 Position and adjust R206 for a reading of 3.0 mV.

Connect a Sweep Test Signal to J1 the RF Input Jack of the UHF Amplifier Tray. On the (A5-A2) Amplifier Board tune Capacitors C105 and C205 for peak output power then tune C119 and C219 for peak output power with a flat frequency response and minimum current.

<u>To adjust the Idling Currents, no RF applied to the Tray, of the Devices on (A5-A3):</u>
Connect a Voltage Meter across E1 and E2 on the Amplifier Protection Board and switch S1 to the I7 Position and adjust R106 for a reading of 3.0 mV. Switch S1 to the I6 Position and adjust R206 for a reading of 3.0 mV.

Connect a Sweep Test Signal to J1 the C219 for peak output power with a flat frequency

response and minimum current.RF Input Jack of the UHF Amplifier Tray. On the (A5-A3) Amplifier Board tune Capacitors C105 and C205 for peak output power then tune C119 and
and C219 for peak output power with a flat frequency response and minimum current.

To adjust the Idling Currents, no RF applied to the Tray, of the Devices on (A5-A4): Connect a Voltage Meter across E1 and E2 on the Amplifier Protection Board and switch S1 to the I9 Position and adjust R106 for a reading of 3.0 mV. Switch S1 to the I8 Position and adjust R206 for a reading of 3.0 mV.

Connect a Sweep Test Signal to J1 the RF Input Jack of the UHF Amplifier Tray. On the A5-A4 Amplifier Board tune Capacitors C105 and C205 for peak output power then tune C119 and C219 for peak output power with a flat frequency response and minimum current.

To adjust the Idling Currents, no RF applied to the Tray, of the Devices on (A5-A5): Connect a Voltage Meter across E1 and E2 on the Amplifier Protection Board and switch S1 to the I11 Position and adjust R106 for a reading of 3.0 mV. Switch S1 to the I10 Position and adjust R206 for a reading of 3.0 mV.

Connect a Sweep Test Signal to J1 the RF Input Jack of the UHF Amplifier Tray. On the (A5-A5) Amplifier Board tune Capacitors C105 and C205 for peak output power then tune C119 and C219 for peak output power with a flat frequency response and minimum current.

7.2.3.9 (A5-A6) 4 Way Combiner Assembly

Contains: (A5-A6-A1) A 4 Way Combiner Board.

This board contains no adjustments.

7.2.3.10 (A6-A1) Dual Peak Detector Board, Single Supply

Is mounted in (A6) a Dual Peak Detector Enclosure.

This board contains no adjustments.

7.2.3.11 (A7) Amplifier Protection Board

This board contains no adjustments.

7.2.3.12 (A8) Amplifier Control Board

To check the operation of the Overdrive circuit. Increase the gain pot of the UHF Amplifier Tray to approximately 110 %. The Overdrive LED DS2 should light and the output power should not increase above the 110 % level. Adjust the Overdrive Threshold as needed, if the LED does not light.

7.2.3.13 (A12) Pioneer Magnetics +26.5V/2000W Switching Power Supply

This Switching Power Supply contains no customer repairable items, if the Power Supply should malfunction, do not attempt to repair the power supply without first consulting Axcera Field Support Dept. The Power Supply is adjusted to provide +26.5 VDC output.

7.2.3.14 Calibration of Output Power and VSWR Cutback

Place a Wattmeter and Dummy Load of at least 600 Watts at the Output of the Tray that is to be calibrated and switch the front panel meter to the % Output Power position. Preset R16 Manual Gain, located on (A8) the Amplifier Control Full CCW. Switch S1 located on the Amplifier Control Board to the **Manual** position. Insert a Visual Only with Sync Only Test Signal to the System and verify 40 IRE Units of Sync Test Signal. Adjust R16 for 360 Watts Sync on the Wattmeter.

The following Test using Zero Span and Aural addition is for Analog only. Monitor a sample of the output with a Spectrum Analyzer set to the 0 Span position and adjust the Spectrum Analyzer so that the level of the output is at the top line of the graticule. Insert -10 dB of Aural to the Visual Sync Only Test Signal and adjust R16 for the same reference level on the Spectrum Analyzer as with the Visual Only input. The output power on the Wattmeter should be approximately 550 Watts Visual & -10 dB Aural. Calibrate the Front Panel Output Power Meter to 100% with R2, Forward Calibration, located on the Amplifier Control Board.

Reduce the Manual Gain Pot R16 to a 50 % reading on the front panel meter in the % Output Power position. Turn the Tray Off. Remove the Load from the output of the Tray and switch the front panel meter to the Reflected Output Power Position. Switch the Tray On. Adjust the Reflected Power adjust Pot R22 located on the Amplifier Control Board to a 50% reading. Then adjust R29, the VSWR Threshold Cutback Pot located on the Amplifier Control Board until the VSWR Cutback LED DS1 located on the front panel just lights. This sets up the VSWR Cutback Circuitry. After the set up is completed, switch S1 located on the Amplifier Control Board to **Automatic Gain Control**, which is the normal operating position for the switch.

The UHF Amplifier Tray is aligned and calibrated and ready for normal operation.