7. PARTS LIST/TUNE-UP INFO

7.1 Parts List

The transmitter, can be subdivided as follows:

Driver Tray:
Power Conditioning Board
Digital Modulator Board
IF Pre-Corrector Board
ALC Board
Output Detector Board
Control Card Board
Frequency Agile Upconverter Board
Amplifier Module
Astec Switching Power Supply
Switching Power Supply

Power Amplifier Tray: (x1)
Splitter Board
Analog Bias Board (x2)
Combiner Board
Current Metering Board
Control Board
Switching Power Supply (x1) or (x2) for N+1 Operation

7.2 Tune-Up Information

This transmitter was aligned at the factory and should not require additional adjustments to achieve normal operation.

This transmitter is of a tray design with multiple boards inside the tray. If a board fails, that board needs to be changed out with a replacement board. The failed board can then be sent back for repair.

7.2.1 Set-Up of the Output Power of the Transmitter

Check that the Auto/Man switch S1 on the IF Pre-Corrector Board is in the Automatic ALC position. This is the normal operating position for the switch. The voltage at TP1 on the IF Pre-Corrector Board should be .8 VDC with 100% output power.

Check that the Auto/Man switch S1 on the ALC Board is in the Automatic ALC position. Adjust R75 the ALC pot on the ALC Board as needed to attain 100% output power. Switch to Manual Gain (Manual ALC) and adjust the Manual Gain pot R62 for 100 % output power. Switch the ALC Board back to Automatic ALC.

7.2.2 ALC Board Set-Up In the Tray

On (A5) the ALC Board (1308570), preset the Overdrive Threshold pot R38 full CW and set R62, Manual Adjust, and R75, ALC Adjust, full CCW.

Apply an 8-VSB signal at -3 dBm average level to the J1 input jack to the tray. Switch S1 to Manual Gain, and increase the output power to 100%. Calibrate the transmitter

output power using R23, Forward Calibration pot, on the Output Detector Board.

Turn the output power down to 10% power. Remove the output RF connector from J2 on tray and calibrate the reflected power to 10%, using R7, the Reflected Calibration pot, on the Output Detector Board. Re-connect the RF output connector to the tray and increase the power, in Manual gain, to 110%. Adjust the Overdrive pot R38, CCW until the overdrive threshold just trips and the Overdrive Fault LED DS4 lights. Turn the pot slightly CW so that power comes back up and DS4 goes out.

Switch S1 to ALC. Turn the ALC Adjust pot R75 until the power is 100%. Switch S1 between ALC and Manual to verify smooth switching, with minimal change in power.

Switch the tray Off and insert a 10 dB attenuator at the input. Switch the tray On and verify the input fault LED comes on and the RF power Mutes. Output power should drop by at least 20-30 dB.

Switch the tray Off and remove the 10 dB attenuator. Replace the input connector and turn the tray back on. With the tray in ALC, use the ALC Adjust pot, R75, to decrease the power to 10%. Remove the RF output connector from the tray. Verify that the VSWR Cutback LED, DS6, comes on and the Reflected Power drops to approximately 6%. Reconnect the RF output connector and increase the power back up to 100%.

This completes the set up of the ALC board.

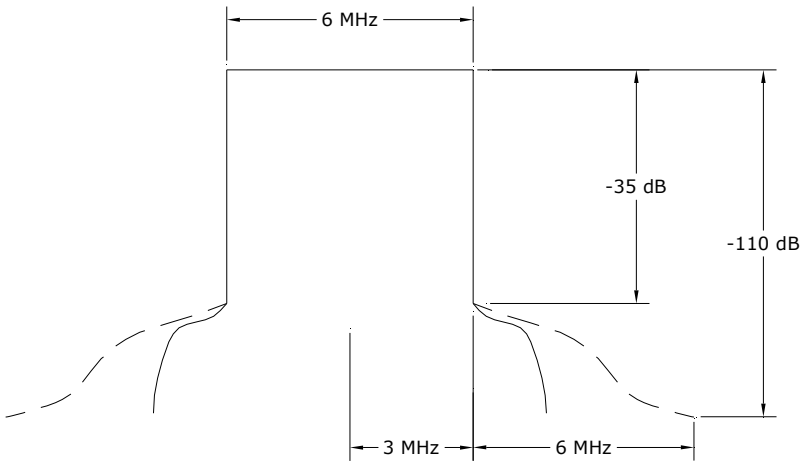

Figure 3: Typical Digital Spectrum

7.2.3 Linearity Correction Adjustment (Non-Linear Distortions)

As shipped, the transmitter was preset to include amplitude and phase pre-distortion. The pre-distortion was adjusted to approximately compensate the corresponding non-linear distortions of the Power Amplifier.

NOTE: On (A3) the IF pre-corrector board (1308796), check that the correction enable/disable jumper W4 on J8 is in the Enable position, between pins 2 & 3.

Set up a spectrum analyzer with 30 kHz resolution bandwidth and 30 kHz video bandwidth to monitor the intermodulation products of the RF output signal of the Tray at J2. A typical digital spectrum is shown in Figure 3.

There are three Corrector stages, two in phase and one quadrature, adjustments located on the IF Pre-Corrector Board. The adjustments are threshold settings that are adjusted as needed to correct for any amplitude or phase intermod problems. Adjust in phase linearity correction adjustment R67 threshold 1 cut in for the in phase amplitude distortion pre-correction that is needed. Next adjust the linearity correction adjustment R69 threshold 2 cut in also for the in phase amplitude distortion pre-correction that is needed. Finally, adjust the quadrature linearity correction adjustment R89, threshold cut in, for the quadrature phase distortion pre-correction that is needed. The above pots are adjusted for the greatest separation between the digital signal and the intermod at the channel edges.

7.2.4 Frequency Response Delay Equalization Adjustment at 44 MHz

The procedure for performing a frequency response delay equalization adjustment for the transmitter is described in the following steps. Check that the jumpers on J4, J5 & J6 are set for 44 MHz between Pins 2 & 3.

The center frequency for the first stage is 46.5 MHz. Adjust R24, located on the IF Pre-Corrector Board, for the best depth of frequency response correction at 46.5 MHz. C14 may need to be adjusted to attain best depth at 46.5 MHz.

The center frequency for the second stage is 41.5 MHz. Adjust R25 for the best depth of frequency response correction at 41.5 MHz. C15 may need to be adjusted to attain best depth at 41.5 MHz.

The center frequency for the third stage is 44 MHz. Adjust R26 for the best depth of frequency response correction at 44 MHz. C16 may need to be adjusted to attain best depth at 44 MHz.

After the three delay attenuation equalizers have been adjusted, fine tune, as needed, for the best frequency response across the channel.

The transmitter is now set up and ready for normal operation.