7. PARTS LIST/TUNE-UP INFO

7.1 Parts List

The transmitter, can be subdivided as follows:

Exciter Tray:

- DM8 - Digital Modulator Module
- IF Processor Module
- VHF/UHF Upconverter Module
- Control & Monitoring / Power Supply Module
- Power Amplifier Module

External Amplifier Tray:

- 4-Way Splitter
- Power Amplifier Module (Qty of 4)
- Power Supply Module (Qty of 2)
- 4-Way Combiner

7.2 Tune-up Information

The LU500ATD transmitter was aligned at the factory and should not require additional alignments to achieve normal operation.

7.2.1 Exciter/Amplifier Chassis Assembly

This transmitter takes the baseband audio and video inputs or, if the (Optional) 4.5-MHz composite input kit is purchased, either a single composite video + 4.5-MHz input or separate baseband video and audio inputs, and converts them to the desired UHF On Channel RF Output at the systems output power level.

7.22 DM8 - Digital Modulator Assembly

Note: Not present in Translator systems.

The Digital Modulator Assembly has adjustments for video levels and audio modulation levels, and other related parameters.

Verify that all red LEDs located on the IF Processor front panel are extinguished. The following details the meaning of each LED when illuminated:

- DS1 (input fault) – Indicates that either abnormally low or no IF is present at the input of the module.

- DS2 (ALC fault) – Indicates that the ALC circuit is unable to maintain the signal level requested by the ALC reference. This is normally due to excessive attenuation in the linearity signal path or the IF phase corrector signal path, or that switch SW1 is in the Manual ALC Gain position.

- DS4 (Mute) – Indicates that a Mute command is present to the system.

Switch the transmitter to Standby. The ALC is muted when the transmitter is in Standby. To monitor the ALC, preset R3, manual gain adjust, on the front panel of the Upconverter module, fully CCW. Move switch SW1, Auto/Man AGC, on the front panel of the

Upconverter module, to the Manual position. Place the transmitter in Operate. Adjust the ALC GAIN pot on the front panel of the IF Processor to obtain +0.8 VDC on the LCD Display on the Controller/Power Supply in the ALC screen. Move the MAN/AUTO ALC switch back to Auto, which is the normal operating position.

To adjust the AGC Cutback setting, raise the output power of the transmitter to 110%. Adjust R2, AGC Cutback, located on the front panel, CCW until the LED DS1, AGC Cutback, just starts to flash. Return the output power of the transmitter to 100%.

7.2.3 If Processor Module Assembly

On the LCD Display, located on the Controller/Power Supply Module, push the button to switch the transmitter to Operate. The setup of the RF output includes adjustments to the drive level of the Power Amplifier, the adjustment of the linearity and phase pre-distortion to compensate for any nonlinear response of the Power Amplifier on the front panel of the IF Processor module.

Verify that all red LEDs located on the IF Processor front panel are extinguished. The following details the meaning of each LED when illuminated:

- DS1 (input fault) – Indicates that either abnormally low or no IF is present at the input of the module.
- DS2 (ALC fault) – Indicates that the ALC circuit is unable to maintain the signal level requested by the ALC reference. This is normally due to excessive attenuation in the linearity signal path or the IF phase corrector signal path, or that switch SW1 is in the Manual ALC Gain position.
- DS4 (Mute) – Indicates that a Mute command is present to the system.

Switch the transmitter to Standby. The ALC is muted when the transmitter is in Standby. To monitor the ALC, preset R3, manual gain adjust, on the front panel of the Upconverter module, fully CCW. Move switch SW1, Auto/Man AGC, on the front panel of the Upconverter module, to the Manual position. Place the transmitter in Operate. Adjust the ALC GAIN pot on the front panel of the IF Processor to obtain +0.8 VDC on the LCD Display on the Controller/Power Supply in the ALC screen. Move the MAN/AUTO ALC switch back to Auto, which is the normal operating position.

To adjust the AGC Cutback setting, raise the output power of the transmitter to 110%. Adjust R2, AGC Cutback, located on the front panel, CCW until the LED DS1, AGC Cutback, just starts to flash. Return the output power of the transmitter to 100%.

7.2.4 Linearity Correction Adjustment

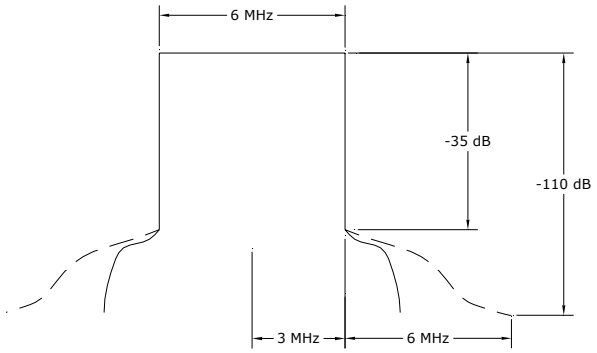
As shipped, the exciter was preset to include amplitude and phase pre-distortion. The pre-distortion was adjusted to approximately compensate the corresponding non-linear distortions of the Power Amplifier.

NOTE: On the IF processor board inside the module the correction enable/disable jumper W12 on J30 must be in the Enable position, on pins 2 & 3.

Set up a spectrum analyzer for 30 kHz resolution bandwidth and 30 kHz video bandwidth. Connect the spectrum analyzer to monitor the intermodulation products of the RF output

signal of the Power Amplifier. A typical digital spectrum is shown in Figure 5-1.

There are three Linearity Corrector stage adjustments located on the front panel of the IF Processor Module. The adjustments are threshold settings that are adjusted as needed to correct for any amplitude or phase intermodulation problems. Adjust the top linearity correction adjustment R211 threshold cut in for the in phase amplitude distortion pre-correction that is needed. Next adjust the middle linearity correction adjustment R216 threshold cut in also for the in phase amplitude distortion pre-correction that is needed. Finally, adjust the bottom linearity correction adjustment R231 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 intermodulation at the channel edges.



Typical 6 MHz Digital Spectrum

7.2.5 Frequency Response Delay Equalization Adjustment

The procedure for performing a frequency response delay equalization adjustment for the transmitter is described in the following steps:

CAUTION: Making the following adjustments will change the linearity correction table loaded in the DM8 Digital Modulator and a new file may need reloaded.

The center frequency for the first stage is 46.5 MHz. Adjust R103, the top frequency response equalizer pot, located on the front panel of the IF Processor Module, for the best depth of frequency response correction at 46.5 MHz.

The center frequency for the second stage is 41.5 MHz. Adjust R106, the middle frequency response equalizer pot, located on the front panel of the IF Processor Module, for the best depth of frequency response correction at 41.5 MHz.

The center frequency for the third stage is 44 MHz. Adjust R274, the bottom frequency response equalizer pot, located on the front panel of the IF Processor Module, for the best depth of frequency response correction at 44 MHz.

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

7.2.6 Calibration of the Transmitter Forward Output Power Level

Note: Perform the following procedure only if the power calibration is suspect.

Switch the Upconverter sled to Manual Gain. Adjust R48, the null offset pot on the visual/aural metering board, full CW. Adjust CCW until 0% visual output is displayed on the LCD Display in the System Forward Power position. Switch the transmitter to Operate.

Next, set up the transmitter for the appropriate average output power level using the Manual Gain pot on the Upconverter sled.

Adjust R9, forward calibration, on the dual peak detector board, mounted on the inside, left side panel, toward the rear of the cabinet, for .8V, as measured at TB30-14 and TB30-12 return, on the terminal block TB30 located on the rear of the exciter/driver chassis assembly. Then adjust the LCD display to read 100% on the front panel meter in the System Forward Power position.

7.2.7 Calibration of the Transmitter Reflected Output Level

Move the Reflected cable on the (A11) coupler to the unused "INC" port on the coupler while adding a 10 dB pad. Then adjust R10 on the dual peak detector board for a .2VDC, at TB30-13 and TB30-12 return, on the terminal block TB30 mounted on the rear of exciter/driver chassis assembly. Next adjust the LED display for 10% reading in the System Reflected Power position. At this 10% reference power reading, a reflected power fault should appear on the System Errors Menu, if the Fault is set at 10% under the set up menu. Turn the power adjust pot slightly CCW and the fault should be clearable on the System Error Menu. Turn the pot CW until the Fault appears. The reflected output power is now calibrated.

Switch the transmitter to Standby and move the Reflected power cable on the A11 Coupler back to the "Reflected Port" and remove the 10dB pad.

When the transmitter utilizes external amplifier modules, the Forward Power readings for each of the amplifier modules will need to be readjusted to a 100% Forward Power reading. **NOTE:** The transmitter must be in the Manual Gain position when readjusting the forward power. These amplifier readings can be found under the Transmitter Details Main Screen, by arrowing down to each Amp Set and each Module. These adjustments are completed after the System Forward and Reflected Powers have been calibrated to 100% power.

The Driver PA Assembly's Visual Calibration adjust pot should be adjusted for .8V AGC 1 on the Upconverter Details Screen found in the Transmitter Details Screens. After the Amplifiers are all calibrated for 100% Forward Power readings, the AGC 2 voltage found on the same Upconverter Details screen should be at .9V.

Switch the transmitter to Operate and adjust the front panel power pot for a 100% visual power reading. Switch the LO/Upconverter to the Auto AGC position.

7.2.8 (A9) Bandpass Filter Assembly

The Bandpass Filter Assembly is tuned to reject unwanted distortion products generated

when the signals are diplexed and also during the amplification process.

The Bandpass Filter is factory tuned to the proper bandwidth and should not need tuned. If you think tuning is needed consult Axcera Field Support Department before beginning the adjustment.

The Transmitter is ready for normal operation.
This completes the detailed alignment procedures for the LX Series transmitter.