

LECTROSONICS TEST & ALIGNMENT PROCEDURE¹

MODEL: UT400

REV: 173232A (Main board)
REV: 17333A (Logic Board)

DATE: 25 September 2003
Firmware Ver: 1.0

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Setup: Logic Board connected to RF Board. 9.0VDC in at RF board measured at battery contacts. Power Switch (SW3) On (Upper) position. Frequency "FF" selected at Logic Board SW1 and SW2. Output RF connected through a connector to P1, P2.

MEASUREMENT.

TEST CONDITIONS

TYPICAL MEASUREMENT RESULT

Program Processor: Program Microprocessor and apply label (**FACTORY ONLY**).

Note that audio LED's, D5 and D6 will begin flashing RED. This condition is normal and represents the condition Of PLL not locked. This will occur until the Block Information is programmed into the Logic Board.

Program Frequency Block Number: Short Logic Board J7 pin 1 to pin 7. Position Frequency Select switches on Logic Board SW1 and SW2 to desired frequency block (SW1 = MSD, SW2 = LSD). Remove J7 short. This step may also be performed using the LECSET apparatus (does not require J7 short or SW1, SW2 manipulation).

Frequency "FF" selected at SW1, SW2 of Logic Board after setting frequency block.

Current Draw.

40 to 50 mA PLL Unlocked
65 to 85 mA PLL Locked

DC Voltage Measurements: Measure DC Voltage at:

TP30	+ 1.8 VDC, +/- 100mV
J5 Pin 6	+3.3VDC, +/- 200mV
TP29	-3 VDC, +/- 200 mV

Power Up LED Test. Power D.U.T. down and back up. Observe operation of LED's D5, D6 and D7 as follows:

At power up:	All 3 LED's flash RED
After less than 1 second:	All 3 LED's flash GREEN
After less than 1 second:	All 3 LED's OFF
After approximately 1 second:	D5 and D6 flash GREEN 4 times, then OFF
After approximately 1 second:	D7 continuous GREEN

Power LED Test: Reduce input VDC at Battery Contacts. Observe operation of **Power LED D2.**

+7.3 VDC:	LED turns RED
+6.8 VDC:	LED flashes RED

Output Power, Frequency, Pilot Tone and VCO Verification:

Measure FF carrier signal power at RF Board P1, P2.	+19 to +20 dBm
Short Logic Board J7 pin 1 to pin 7.	
Adjust Logic Board SW2 to achieve proper carrier frequency at Main Board P1.	FF frequency +/- 2 KHz
Remove short.	
Return Logic Board SW2 to F position.	
Momentarily interrupt power at Main Board.	
Measure Pilot Tone level and frequency.	-5.0 to -4.0 dBV, 25.136 KHz +/- 2 H
Set Logic Board SW1 and SW2 to 00 position	
Momentarily interrupt power at Main Board.	
Measure 00 carrier signal power at Main Board P1.	+19 to +20 dBm
Measure 00 carrier frequency at Main Board P1.	00 frequency +/- 2 KHz
Measure Pilot Tone level and frequency.	-5.0 to -4.0 dBV, 32.000 KHz +/- 2 Hz
Move Logic Board SW1 to position 8 (use 100 MHz span, 80 ctr). Measure frequency change (1.6 MHz), power and stability at each switch position.	
Move Logic Board SW2 to position 8. Measure frequency change (0.1 MHz)	
Return SW2 to F position.	
Momentarily interrupt power at Main Board	
Measure 80 carrier signal power at Main Board P1.	+19 to +20 dBm
Measure 80 carrier frequency at Main Board P1.	80 frequency +/- 2 KHz
Measure Pilot Tone level and frequency.	-5.0 dBm to -4.0 dBm, 28.554 KHz +/- 2 Hz

¹ Test condition changes are in **bold** type. Measurement results are typical and do not indicate 'specs' unless min., max., or a range is specified. Small deviations from these 'typical' values does not constitute malfunction. Measurement result values apply only if this procedure (including initial setup) is followed. Some assembly required.

Mic Gain Pot to Mid position, 250 Hz, -36 dBm audio signal in at J1-2 of Audio Board. Increase audio signal 1 dBV until D5 turns RED.

Disable Pilot Tone:

Short Logic Board J7 pin 1 to pin 7.
Set Logic Board SW1 to D position
Set Logic Board SW2 to 0 position
Remove J7 short.

Disable Compressor:

Short Logic Board J7 pin 1 to pin 7.
Set Logic Board SW1 to D position
Set Logic Board SW2 to 0 position
Remove J7 short.

Set Audio Modulation Distortion:

Short Logic Board J7 pin 1 to pin 7.
Set Logic Board SW1 to 0 position.
Adjust Logic Board SW2 for minimum distortion at Main Board P1. 0.2 to 0.4 % THD
Remove J7 short.

Set Audio Modulation Deviation:

Short Logic Board J7 pin 1 to pin 7
Set Logic Board SW1 to 5 position. 99.0 kHz to 101.0 Khz
Adjust Logic Board SW1 for 100 Khz deviation at Main Board P1.
Set Logic Board SW1 to 4 position. 99.0 kHz to 101.0 Khz
Adjust Logic Board SW1 for 100 Khz deviation at Main Board P1.
Set Logic Board SW1 to 6 position. 99.0 kHz to 101.0 Khz
Adjust Logic Board SW1 for 100 Khz deviation at Main Board P1.
Remove J7 short.

Disable Calibration Modes: Cycle Power.

250 Hz, -25 dBV in at Audio Board J1-pin2.

Modulator Deviation Check:

Freq. "FF" selected at Main Board SW1 and SW2. 42 Khz deviation +/- 3 Khz
Freq. "00" selected at Main Board SW1 and SW2. 42 Khz deviation +/- 3 Khz

Mic Gain Pot to Mid position, 250 Hz, -40 dB audio signal in at J1-2 of Audio Board.

Set Limiter Range

Short Logic Board J7 pin 1 to pin 7
Set Logic Board SW1 to 7 position.
Reference audio level measured at TP4.
Set Logic Board SW1 to 8 position.
Adjust Logic Board SW1 for -6 dBV + or - 1.5 dB.
Remove J7 short.

Main Board Audio LED Setting:

Increase audio signal level in at P4-2 by 0.25 dBV steps until -20 dB LED (D5) changes from GREEN to RED.
Increase audio signal level in at P4-2 by 10 dBV.
Short Logic Board J7 pin 1 to pin 7. Set Logic Board SW1 to D position and SW2 to 3 position.
Remove J7 short.
Verify that -10 dB is RED within 2 dB of audio signal level at P4-2.
Remove Audio input to J1-2.

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Battery Status Telemetry Adjustment:

+6.0 VDC in at Main Board battery contacts.

Logic Board SW1 to 8 position, SW2 to 0 position.

Short Logic Board J7 pin 1 to pin 7.

Set Logic Board SW1 to C position.

Set Logic Board SW2 to B position.

Measure and note carrier frequency at Main Board P1.

Set Logic Board SW1 to D position.

Measure and note carrier frequency at Main Board P1.

Adjust Logic Board SW2 for carrier frequency that is 3.5 Khz different than the carrier frequency measured at Logic Board frequency setting of CB.

Remove J7 short.

+9.0 VDC in at Main Board battery contacts.

Turn Power Off at Main Board SW2. Power LED flashes RED for 2 to 3 seconds.

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