

----- 148GTL-DX (LATE) ALIGNMENT PROCEDURES -----

(Note: You have an 'Early' unit if serial number is between the following ranges: 03000001-4498 to 13000001-1504) Secret C.B. Vol. 16, has complete alignment procedures, for the 'Early' version.

Complete Alignment Procedures for the 'Late' Version of 148GTL-DX

PLL/OSCILLATOR ALIGNMENT

Equipment Needed: Oscilloscope, D.C. Volt Meter, Frequency Counter..

| Step | Control Settings | Adjust | Perform/Check for |
|------|--|--------|---|
| A | Mode: RX Band: MID Mode: AM Voice Lock-Center CH: 19 | L17 | Connect Oscilloscope to TP-4 (lead of R124). Adjust for Max. reading |
| B | Same as above, CHANGE to: CH: 40 | L18 | Connect DC Volt Meter to TP-2 (Lead of R126). Adjust for 5.4 Volts.. |
| C | Step A Settings | L19 | Connect Oscilloscope to TP-3 (Lead of R84). Adjust for Max reading |
| D | Step A Settings | L21 | Frequency Counter to TP-3 (lead of R-84). Adjust for 16.490MHz |
| E | Step A Settings, CHANGE to: Mode: USB | L22 | Leave Frequency Counter as is... Adjust for 16.4925MHz |
| F | Step A Settings, CHANGE to: Mode: LSB | L23 | Leave Frequency Counter as is... Adjust for 16.4875MHz |
| G | Step A Settings, CHANGE to: Mode: LSB Band: MID | VR6 | Leave Frequency Counter as is... Adjust for 16.4875MHz, (Recheck Step F.....) |
| H | Step A Settings, CHANGE to: Mode: CW | L37 | Frequency Counter to TP-6 (Lead of R60). Adjust for 10.695MHz |

148GTL-DX...PLL/OSCILLATOR ALIGNMENT...Cont.

| Step | Control Settings | Adjust | Perform/Check for |
|------|---|--------|---|
| I | Step A Settings, CHANGE to: Mode: USB | L38 | Leave Frequency Counter as is... Adjust for 10.6925MHz |
| J | Step A Settings, CHANGE to: Mode: LSB | L39 | Leave Frequency Counter as is... Adjust for 10.6975MHz |

End of PLL/OSC. alignment...

- - - RECEIVER ALIGNMENT - - -

Equipment Needed: Sig. Gen.(27MHz Band, 1000Hz, 30% AM Mod., 1KHz-1.5KHz Dev. FM Mod.); Audio VTVM, Oscilloscope, Dummy Load (8 ohm, 5W resistive), D.C. Power Supply...

| Step | Control Settings | Adjust | Perform/Check for |
|------|--|--|---|
| A | CH: 40 BAND: Low NB/ANL: Off MODE: AM Voice Lock-Center SQ: Max, CCW TONE: Hi RF GAIN: Max, CW CH 9: Off | None | Double check all settings |
| B | Same as Step A | L8 | Turn core to bottom.. |
| C | Step A Settings, CHANGE to: Mode: AM Band: LOW CH: 19 | L4, L5, L7, L9, L11, L12, L13.. | Adjust for Max readings, and then readjust using L8 for maximum again... |
| D | Step A Settings, CHANGE to: Mode: USB Band: LOW CH: 19 | L14, L15 | Adjust for Max. readings.. |
| E | Step A Settings, CHANGE to: Band: MID Mode: USB NB/ANL: ON | L1, L2 | Set Sig Gen on Ch. 39, 27.395MHz. With no-modulation. Connect O-scope to TP-1 (Lead of D2) and adjust coils for Max reading on O-Scope. Set level of Sig Gen to 5uV, then readjust this step. |
| F | Step A Settings | VR4 for AM/FM... VR3 for SSB/CW.. | Set the Sig Gen to Ch. 40, 27.405MHz 30% AM Modulation with 1000uV. Then turn VR4, so that the AF signal is on scope(at TP-1). Repeat for SSB/CW mode with VR3. |

148GTL-DX...RECEIVER ALIGNMENT....Cont.

| Step | Control Settings | Adjust | Perform/Check for |
|------|-------------------------------------|--------------------------------------|--|
| G | Step A Settings | VR1 for AM/FM... VR2 for SSB/CW.. | Set Sig Gen to CH. 40, 27.405MHz no modulation. Level of Sig Gen 100uV. Adjust VR1 for S-9 reading on radio's meter. Repeat for VR2 by adjusting in SSB/CW mode. |
| H | Step A Setting, CHANGE to: Mode: FM | I6 | Set Sig Gen to 1mv with 1.5KHz of deviation of 1KHz, adjust I6 for Max. sinewave output on O-scope. |

End of RECEIVE Alignment...

- - - TRANSMITTER ALIGNMENT - - -

Equipment Needed: VTVM (Full scale, 1V DC with RF Probe); RF Output Power Meter; Spectrum Analyzer; Frequency Counter (30MHz); D.C. Power Supply (Regulated 13.8V, 4A); 50 ohm load and attenuator; O-Scope(30MHz); AF Oscillator; DC Ammeter...

| Step | Control Settings | Adjust | Perform/Check for |
|------|--|----------------|---|
| A | Mode: TX Band: MID CH: 19 Mode: USB Mic. VR: CW CH 9: OFF Coarse: CENTER | VR11 | Remove PC-834 (PCB) and connect DC Ammeter to TP9 (+) and TP8 (-). Adjust for 50ma reading. |
| B | Step A Settings | VR10 | Connect DC Ammeter to TP9 (+) and TP7 (-), and adjust for 50ma. |
| C | Step A Settings CHANGE to: Mic input 30mV 1KHz. | VR12, L53... | Restore PC-834. Turn VR12 to Max CW.. Turn core of L53 to bottom.. |
| D | Same as above.. <u>MAKE NO CHANGES</u> | L52, L54, L55, | Adjust for Max reading on RF VTVM |
| E | Same as above.. <u>MAKE NO CHANGES</u> | L53 | Set the Band Sw: HI, CH 40, and adjust for max reading on RF VTVM. Set the Band Sw: LOW, CH 1, readjust for minimum difference in output power... |

148GTL-DX...TRANSMITTER ALIGNMENT...(Cont.)

| Step | Control Settings | Adjust | Perform/Check for |
|------|--|--------|--|
| F | Step A Settings CHANGE to: Mode: AM Mic input 90% modulation | I44 | Adjust for Max reading on RF VTVM |
| G | Step A Settings CHANGE to: Mic input 30mV 1KHz | VR12 | Adjust for 24.5V reading on RF VTVM |
| H | Step A Settings | VR7 | Adjust for Min reading on Spectrum Analyzer for USB and LSB. |
| I | Step A Settings CHANGE to: Mode: AM | VR13 | Adjust for 5.0W on RF Power Meter |
| J | Same as above.. <u>MAKE NO CHANGES</u> | VR8 | Set the meter SW to S/RF position. Adjust VR8, so that the radio's meter reads 5W (Between Green and Red zones). |
| K | Same as above.. ---CHANGE:----- Mic input to 30mV | VR14 | Adjust for 90% modulation on scope |
| L | Step A Settings CHANGE to: Mode: FM CH: 40 Mic input 30mV | VR5 | Adjust for 5KHz deviation |
| M | Same as above.. ---CHANGE:----- Mode: CW | VR15 | Adjust for 0.2V reading on AF VTVM when CW key is keyed |
| N | Step A Settings CHANGE to: CH 9 SW; CH 9 | | Confirm output F_o - 27.065MHz... |

End of TRANSMIT Alignment...

This completes the 148GTL-DX (LATE VERSION) alignment procedure.....