

KY 196B

ALIGNMENT PROCEDURE

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# Revision History

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## 1.0 TEST AND ALIGNMENT

The following is the procedure that must be followed in order to insure the minimum performance requirements are met by the KY 196B Communications Transceiver.

## 2.0 GENERAL INFORMATION

This alignment procedure is written for a transceiver that is either newly constructed or recently overhauled. If partial alignment is desired, use only the initial control settings that apply to the section being aligned.

### 2.1 Test Equipment Required

Power Supply	Sorensen SRL 40-6 or equal
RF Signal Generator	HP 8656B with Opt. 001 or equal (0.2PPM time base)
Audio Signal Generator	HP 200CD or equal
Voltmeter	Fluke 8000A or equal
RF Wattmeter	Bird 611 or equal
Frequency Counter	HP5318A with 0.2 PPM time base or equal
Audio Load/Wattmeter	Eico Model 261
Oscilloscope	TEK 465B
6 dB RF Pad	Texscan FP-50
Linear Detector	Figure 1
Mic Test Circuit	Figure 2
40 dB Attenuator	Figure 3
Test Harness	Figure 4

### 2.2 -Reference Documents

PN 300-07469-0040	KY 196B Main Board Assembly
PN 300-09508-XX	KY 196B Processor Board Assembly
PN 300-09501-XX	KY 196B Top Board Assembly
PN 300-06047-XX	KY 196B Transmitter Board Assembly

## 3.0 INITIAL CONTROL SETTINGS

R176	Noise Squelch	Max CW
R267	Mic Compressor Adj.	Max CW
R184	Carrier Squelch Set	Max CCW
R221	Sidetone	Mid Range
R1009	Mic Gain	Mid Range
S901	Switch/Volume Control	Max CCW (off)
S501	Squelch Test Sw.	Out (test position)
R2177	Preselector Tuning Adj	Mid Range

#### 4.0 INITIAL TURN-ON

##### 4.1 Voltage Regulator Test

Connect the unit to RF Load and apply power. Advance the volume control CW to turn on and set to MID-RANGE.

- A. Read the voltage at TP103 and adjust R189 for 9 volts  $\pm 0.1$  volt.
- B. Read the voltage at TP104 and observe 5.0 volts  $\pm 0.25$  volt.
- C. Read the voltage at E938 and observe 94 volts  $\pm 5$  volts.
- D. Read the voltage at E910 and observe -94 volts  $\pm 5$  volts.

##### 4.2 Display Adjust

- 1. Press and hold the CHAN button until program mode is entered.
- 2. While still holding the CHAN button, press and hold the transfer button for 2 seconds.
- 3. Release both buttons.

To change values, use Increment/Decrement knobs. To change modes, momentarily press the CHAN button. Set the three adjust modes as follows:

dA 1 - 1 (photo cell speed adjust)

dA 2 - 020 (minimum brightness adjust)

- dA 3 - 000 (aging display adjust)

Exit Display Adjust mode by pressing the Transfer button.

##### 4.3 EEPROM Errors Counter Clear (Not for Maintenance Manual)

Ground TP502, then press Transfer button. Display should show "EErr 000".

##### 5.0 TCXO and VCO ADJUST

Set frequency to 135.975 MHz and monitor E143 with a frequency counter.

Adjust the frequency to 147.375 MHz  $\pm 25$  Hz using R2417. This should be done within 60 seconds of turn-on.

Read the voltage at TP2401 and adjust C2505 for 8.5 volts DC.

#### 6.0 TRANSMITTER

## 6.1 - Power Set

Adjust R256 to obtain 17.0 watts minimum across the band.

Adjust C637 for minimum power variation across band while maintaining 17 watts minimum.

## 6.2 Modulator Adjust

Set the frequency selector to 128.50 MHz. Apply a 0.4 volt RMS 1 KHz standard test signal to the microphone input and then key the transmitter. (See Figure 2)

Observe the demodulated RF output from the linear detector on an oscilloscope and adjust R1009 for 85% modulation.

Adjust R267 for 70% modulation. Check 118.000 MHz and 135.975 MHz and readjust only if the modulation is lower than 70%.

## 6.3 Sidetone Adjust

Apply a 0.4 volt 1 KHz standard test signal to the microphone input and key the transmitter. Adjust R221 for 4 mW (1.4VRMS) of audio into a 500 ohm load.

## 7.0 RECEIVER ALIGNMENT

### 7.1 RF-IF Alignment

The following alignment is to be made at 136.975 MHz. Connect the unit to the RF signal generator through a 6 dB pad. Turn unit on with squelch and compressor disabled and apply sufficient RF signal for approximately 5.00 volts - DC at TP105.

Load and tune L101, L103, L105 and L107 using a 220 ohm resistor from the top of each tank to ground in the following sequence.

Load L103	Tune L101
Load L101	Tune L103
Load L107	Tune L105
Load L105	Tune L107

Adjust T101, T102, T103, and T104 for maximum AGC voltage. During the above adjustments, the RF signal should be reduced to keep the AGC voltage near 5.00 volts.

Set the radio to display 136.980 (136.975 MHz RF frequency) and adjust L2106 and L2107 for maximum AGC voltage.

Set the radio to display 118.000 MHz. Set the generator to 118.000 MHz.  
Adjust R2177 for maximum AGC voltage.

## 7.2 Noise Squelch Adjustments

Set the radio to display 128.5 MHz. Apply 2.0  $\mu$ V (Hard) of RF modulated 30% with 1 KHz and adjust R176 CW until the receiver just breaks squelch (audio present).

Set the radio to display 128.505 MHz and adjust R2200 CW until the receiver just breaks squelch (audio present).

## 7.3 Carrier Squelch Adjustments

Apply a 128.50 MHz, 12.5  $\mu$ V (Hard) signal into the antenna connector modulated 85% at 8 KHz and slowly adjust R184 until squelch just breaks, (audio present).

## 7.4 Climax Filter Adjustments

Apply a 128.500 MHz, 100  $\mu$ V (Hard) signal modulated 85% at 4.5 KHz. Disable the compressor/squelch. Monitor the audio output with an audio Wattmeter. Adjust L110 for minimum output (Null).