TMC SPECIFICATION			NO. 1399
REV:			
COMPILED:	CHECKED:	APPD:	SHEET OF
TITLE:			

PERFORMANCE SPECIFICATIONS

CARRIER GENERATOR PRINTED WIRING ASSEMBLY 4079994-1 (A5794)

SIDEBAND GENERATOR PRINTED WIRING ASSEMBLY 4079992-1 (A5793)

CARRIER GENERATOR PRINTED WIRING ASSEMBLY 4079994-1 (A5794)

PHYSICAL DIMENSIONS: OVERALL LENGTH 9 1/2 inches

OVERALL HEIGHT 4 19/32 inches

BOARD THICKNESS .062 inches

OPERATIONAL SPECIFICATIONS:

The carrier generator develops a basic sub-carrier or pilot frequency used for conversion and subsequent translation to an RF output frequency band of 3MHz. It also contains a meter amplifier circuit for upper and lower sideband audio translation to an equivalent level for display on a 50μA meter movement when USB or LSB is selected. In addition, an AM amplifier circuit is included and provides an audio amplitude-modulated 250KHz output when AM mode of operation is selected.

The carrier generator receiv es a 1MHz standard frequency input which is then supplied to both the 250KHz and 2.75MHz frequency generation circuits. In the 250KHz channel, the 1MHz input is divided by four to derive the basic 250KHz subcarrier frequency. A switched ground enable is applied to enable a 250KHz subcarrier output signal. In the CW mode, the ground enable is interrupted at the key rate thereby producing a 250KHz CW output.

The 2.75MHz channel produces an RF output by dividing the 1MHz input by four and then multiplying the resultant by 11 to derive the 2.75MHz translation frequency. Switched +12VDC to this channel and to the AM amplifier section is controlled by a mode switch.

OPERATIONAL SPECIFICATIONS: - Continued

The AM amplifier section develops an amplitude-modulated 250KHz signal in the AM mode of operation and consists of an audio amplifier and mixer circuit.

ALIGNMENT PROCEDURE:

Refer to Carrier Generator 4079994-1 Schematic Diagram CK2242

A. Apply a 1MHz frequency to the input (terminal 3) of the 1MHz amplifier (Q1).

B. Connect scope to TP1; signal should be 1 MHz ±1 count, 10±1.0 volts peak-to-peak.

C. Apply a PTT ground to terminal H.

D. Connect scope to TP3 and adjust T1 for maximum 250 kHz ±1 count signal at approximately 0.5 to 1.0 volt peak-to-peak.

E. Connect scope to TP4; adjust T2 for maximum 250 kHz ±1 count signal at approximately 1.4 ±0.1 volts peak-to-peak. Also observe 250 kHz at terminal F.

F. Connect scope to terminal J to observe 250 kHz. Adjust R20 for a level of 70 mv.

G. Connect scope to terminal N and also observe 250 kHz. Adjust R27 for a level of 70 mv p.p..

H. Set R47 fully clockwise; connect scope to TP6 and adjust T3 for maximum signal at 2.75 MHz ±1 count.

I. Connect scope to TP2. Adjust T4 for maximum signal; then adjust R47 for 70 ±5.0 millivolts peak-to-peak at 2.75 MHz ±1 count.

ALIGNMENT PROCEDURE: - Continued

J. Apply a 1KHz audio signal to terminal 11, 250 KHz to terminal 12 and +12^{V} to terminal 2.

K. Observe terminal 14 with a scope for an audio modulated signal. Tune T5 for a proper waveform and then adjust R69 for a level of 30 mv.

SIDEBAND GENERATOR PRINTED WIRING ASSEMBLY 4079992-1

PHYSICAL DIMENSIONS:	OVERALL LENGTH	9 1/2 inches
	OVERALL HEIGHT	4 19/32 inches
	BOARD THICKNESS	.062 inches

OPERATIONAL SPECIFICATIONS:

The sideband generator includes upper and lower sideband circuits which are similar in configuration and operation. The exception is the tuned frequency of the USB and LSB amplifier circuits. The sideband generator also contains a microphone audio preamplifier and an audio impedance-matching transformer for translation of external applied 600-ohm USB/LSB line audio to a 500-ohm audio output.

When a microphone input is used, a PTT switch is set to the press-to-talk (PTT) position to furnish a PTT ground enable to the MIKE AMPLIFIER. Microphone audio from 250 to 3040Hz is applied to the sideband generator audio preamplifier circuit and then to the sideband generator modulator circuits.

Similarly, 600-ohm line audio from 250-3040Hz (or others as requested) is translated to a 500-ohm line output and applied to the mode switching network. In the USB, LSB and ISB modes, the audio is routed to the modulation input of the respective sideband generator. In the AM mode, the respective audio signal is applied to the AM generator in carrier generator. USB and LSB audio amplitude is controlled by a respective front panel Mike/Line gain control.

OPERATIONAL SPECIFICATIONS: - Continued

The SSB modulation section of the sideband generator accepts both a 250KHz subcarrier input and the USB/LSB audio signal via the mode switch. These two signals are applied to a balanced modulator to derive the upper and/or lower sideband intelligence. The 250KHz subcarrier is suppressed.

ALIGNMENT PROCEDURE:

A. Connect audio generator, with one side grounded, to USB 600Ω LINE INPUT.

B. Using ac VTVM, set audio generator for 1 KHz output at 78 millivolts (-20 dBm).

C. Set MODE switch and METER switch on front panel to USB position.

D. Set USB MIKE-LINE control for 2/5 of full-scale reading on MONITOR meter (reading of 2).

E. Connect VTVM to TP4; level should be approximately 16 millivolts rms (44±5.5 mv peak-to-peak).

F. Connect scope to TP5 and adjust T1 for 30 to 60 mv peak-to-peak signal. Adjust USB MIKE-LINE control for full-scale reading on MONITOR meter.

G. Adjust R28 and C52 until waveform is symmetrical, with sharp, clear crossover, as viewed on the scope.

H. Reset USB MIKE-LINE control for 2/5 full scale on MONITOR meter.

I. Adjust R34 for 200 ±50 mv peak-to-peak, with scope between collector of Q7 and ground.

ALIGNMENT PROCEDURE: - Continued

J. Connect scope to output of USB TERMINAL S. Amplitude should be 30 to 50 mv peak-to-peak (one single frequency at 251 kHz±1 count adjusted by R34).

K. Connect audio generator, with one side grounded, to LSB 600Ω LINE INPUT.

L. Using ac VTVM, set audio generator to 1kHz, at 78 millivolts (-20 dBm).

M. Set MODE and METER switches on Exciter front panel to LSB position.

N. Set LSB MIKE-LINE control for 2/5 full-scale reading on MONITOR meter (reading of 2).

O. Connect VTVM to TP1: level should be approximately 16±2.0 millivolts rms (44 ±5.5 mv peak-to-peak).

P. Connect scope to TP8 and adjust T2 for 0.04 to 0.07 volt peak-to-peak signal; adjust LSB MIKE-LINE control for full-scale reading on MONITOR meter.

Q. Adjust R54 and C53 until waveform is symmetrical with sharp clear crossover, as viewed on scope.

R. Return LSB MIKE-LINE control for 2/5 full-scale reading on MONITOR meter.

S. Adjust R60 for 200 ±50 mv peak-to-peak, with scope between collector of Q12 and ground.

T. Connect scope to output of LSB TERMINAL S. Amplitude should be 30 to 50 mv peak-to-peak (one single frequency at 249 kHz ±1 count adjusted by R60.

ALIGNMENT PROCEDURE: - Continued

U. Connect audio generator to front panel MIKE input jack.

V. Set audio generator 1 kHz, at 1.0 mv rms, as measured with VTVM.

W. Connect a short jumper across C49.

X. Connect VTVM to TP3.

Y. Adjust R9 for a level of 40 $\pm$2.0 mv rms.