

# 5

## SECTION

### CALIBRATION

#### 5.1 FACTORY REPAIR

Wavetek maintains a factory repair department for those customers not possessing the necessary personnel or test equipment to maintain the instrument. If an instrument is returned to the factory for calibration or repair, a detailed description of the specific problem should be attached to minimize turnaround time.

#### 5.2 REQUIRED TEST EQUIPMENT

Voltmeter . . . . . 0.1 mVdc resolution (0.1% accuracy)  
 Oscilloscope, Dual Channel . . . . .  $\geq 150$  MHz bandwidth  
 Distortion Analyzer . . . . . To 600 kHz  
 Counter . . . . . To 20 MHz (0.1% accuracy)  
 50 $\Omega$  Load . . . . .  $\pm 0.1\%$  accuracy, 2W  
 Generator . . . . . 200 kHz signal, 2 to 20V p-p

#### 5.3 REMOVING GENERATOR COVERS

1. Invert the instrument, remove the four screws in the cover.
2. Turn the instrument upright, remove the top cover, and remove the four screws securing the bottom cover.
3. Replace the top cover and turn the instrument upside down.

#### NOTE

*Remove the bottom cover only when it is necessary to make adjustments or measurements.*




#### 5.4 CALIBRATION

After referring to the following preliminary data, perform calibration, as necessary, per table 5-1. If performing partial calibration, check previous settings and adjustments for applicability. See figures 5-1 and 5-2 for calibration point location.

1. Unless otherwise noted, all measurements made at the 50 $\Omega$  OUT connector should be terminated into a 50 $\Omega$  ( $\pm 0.1\%$ ) load.
2. Allow the unit to warm up at least 30 minutes for final calibration. Keep the instrument covers on to maintain heat. Remove covers only to make adjustments or measurements.
3. Verify operation in TRIG and GATE modes by connecting an external generator to the TRIG IN BNC and observing proper operation of TRIGGER LEVEL and TRIGGER START/STOP controls (paragraph 3.1).
4. Verify SYNC OUT is an approximate 30 ns positive pulse into 50 $\Omega$  and that GCV OUT is a voltage proportional to dial position with a 2V max (open circuit).
5. Properly terminate the TTL,  $\overline{\text{TTL}}$ , ECL and  $\overline{\text{ECL}}$  outputs (paragraph 3.2.1) and verify proper operation (paragraph 3.1).
6. Start the calibration by connecting the unit to an ac source and setting the front panel switches as follows:

Dial . . . . . .02  
 FREQ MULT . . . . . 100K  
 FREQ VERNIER . . . . . Full cw  
 GENERATOR MODE . . . . . CONT  
 TRIGGER LEVEL . . . . . Full ccw  
 TRIGGER START/STOP . . . . . 0° CAL  
 PULSE DELAY . . . . . 50 ns  $\downarrow$  100 ns  
 PULSE DELAY VARIABLE . . . . . cw  
 Pulse Mode . . . . . DOUBLE  
 PULSE WIDTH . . . . . OFF  
 PULSE WIDTH VARIABLE . . . . . 12 o'clock  
 DC OFFSET . . . . . OFF  
 FUNCTION . . . . . DC  
 ATTENUATION . . . . . 20  $\downarrow$  0  
 ATTENUATION VERNIER . . . . . Full ccw  
 POWER . . . . . ON

Table 5-1. Calibration Chart (Continued)

Step	Check	Tester	Cal Points	Control Settings	Adjust	Desired Results	Remarks
14	1000:1 Symmetry	Scope	FUNCTION OUT		R16 BOD Sym	Symmetrical waveform	<i>NOTE: Steps 13 and 14 are interactive.</i>
15	Main Symmetry			FREQ VERNIER: full cw Dial: 2.0 FREQ MULT: 1K	R35 TOD Sym	Symmetrical waveform	
16	Sine Distortion	Distortion Analyzer, Scope		FUNCTION: 	R120 Triangle Balance	Symmetrical residue	Connect FUNCTION OUT to distortion analyzer and distortion analyzer output to scope. Set scope to .1V/div. Sync scope to SYNC OUT BNC loaded into 50Ω.
17					R93, R107 Triangle Peaks	Minimum sine distortion	If either adjustment is going near a stop, re-center both pots and return to step 15.
18	Main Freq	Frequency Counter/Timer		FUNCTION: 	R4 TOD Freq Adj	2000 ±10 Hz	Remove SYNC OUT cable.
19	Cap Mult Freq			FREQ MULT: 10	R48	20 ±0.1 Hz	
20	X 10M Freq			FREQ MULT: 10M Dial: Vary	C40	Best frequency tracking over X 10M range	
21	X 1M Freq			FREQ MULT: 1M Dial: Vary	C34	Best frequency tracking over X 1M range	This adjustment must be made each time step 20 is done.
22	Trigger Baseline	Scope		FUNCTION:  GENERATOR MODE: TRIG Dial: Vary	R162	Minimum shift of baseline around 0 Vdc	