Incremental and Frequency Lock Circuits

3.17 Adjustment of the 128A to frequencies between the 100 kHz harmonic points selected by the main tuning oscillator control is accomplished with the incremental tuning oscillator. This is a very stable Clapp oscillator covering the frequency range of 200 kHz to 310 kHz tuned by the front panel mounted capacitor. Tuning dial calibration is from -10 to 0 to 100 kHz, providing a range that overlaps the 100 kHz lock points of the main tuning oscillator.

3.18 To make the frequency conversion from the first IF band of 21.000 – 21.110 MHz to the second IF of 2.215 MHz, the second oscillator tunes over the range of 18.785 – 18.895 MHz. Tuning is accomplished solely by means of a varactor diode. Adjusting the incremental tuning oscillator indirectly causes the voltage to change across the varactor diode, providing exact control of the second oscillator frequency. The dc voltage change across the diode is accomplished by the incremental reference oscillator and mixer, the second low frequency (LF) amplifier, the phase discriminator and lowpass filter. Phase locking takes place and the incremental tuning oscillator maintains exact control over the second oscillator.

4 SPECIFICATIONS

4.01 The Sierra 128A Frequency Selective Voltmeter specifications are given in Table 3.

4.02 Specifications for the Sierra 128-PA Balanced Probe are given in Table 4.

Table 3. Sierra 128A Specifications

PARAMETER	CHARACTERISTIC
Frequency Range (4-10 kHz measurements in narrowband mode only)	4 kHz to 15.2 MHz
Main Tuning	
Locked, in 100-kHz steps	0, 100, 200 kHz – 15.1 MHz
Unlocked, continuous	0 to 15.2 MHz
Incremental Tuning	
Continuous	-10 to 100 kHz
Minimum Reading Increment	500 Hz
Accuracy, lock system actuated (at room temperature)	10 ppm ±300 Hz
Input Level Range	
dBm (75, 135, 600 ohms)	-100 to +32 dBm
Voltage (600 ohms only)	3 μvolts to 30 volts
Measurement Accuracy	
At reference of 1 MHz and 0 dBm level	±0.2 dB
Frequency response referred to 1 MHz in attenuator position -70 to +30 dB	
100 kHz to 10 MHz	±0.2 dB
10 kHz to 15 MHz	±0.5 dB
in attenuator positions -90 and -80 dB	
10 kHz to 10 MHz	±0.5 dB
10 MHz to 15 MHz	±0.7 dB

Table 3. Sierra 128A Specifications (Continued)

PARAMETER	CHARACTERISTIC
Attenuator Accuracy Referred to 0 dBm	
−90 dB to +30 dB	
100 kHz to 1 MHz	±0.1 dB
10 kHz to 5 MHz	±0.2 dB
5 MHz to 10 MHz	±0.3 dB
10 MHz to 15 MHz	±0.8 dB
−70 dB to +20 dB	
5 MHz to 10 MHz	±0.2 dB
10 MHz to 15 MHz	±0.3 dB
±10% Line Voltage	±0.1 dB
Input Impedance	
Bridging Mode	Unbalanced
Resistance	Greater than 100 K ohms
Capacitance	
−60 to +30 dB	30 pf
−90 to −70 dB	60 pf
Terminating Mode	75, 135, 600 ohms
Reflection Coefficient	5%
Selectivity	
Wide Bandwidth	
3 dB	3100 ±200 Hz (3-dB points)
60 dB	8000 +500 Hz − 1000 Hz (60-dB points)
Narrow Bandwidth	
3 dB	250 ±50 Hz (3-dB points)
60 dB	1000 ±100 Hz (60-dB points)
Spurious Response	
Image Frequency Rejection (42 to 57 MHz)	70 dB down
Residual Distortion Attenuation	65 dB
Audio Monitor	Continuous operation independent of bandwidth mode
Audio Output	(600-ohm minimum impedance) Phones
Recorder Output	
Level (maximum)	200 μa
Connector	Telephone jack
Power Requirements	
Line Power	115 or 230 volts ac ±10%, 15 VA
External Battery	24-28 volts dc, 230 mA
Overall Dimensions (cabinet)	
Width	20-5/8 inches (524 mm)
Height	12 inches (305 mm)
Depth	17-5/8 inches (448 mm)

Table 4. Sierra 128-PA Balanced Probe Specifications

PARAMETER	CHARACTERISTIC	
Dimensions		
Width	19 inches (483 mm)	
Height	10-1/2 inches (267 mm)	
Depth	14 inches (356 mm)	
Weight (in cabinet)	65 pounds, approx. (29.45 kg)	
Temperature Range	+59°F to +104°F (+15°C to +40°C)	
Circuit Impedance	135 ohms	600 ohms
Frequency Range	10 kHz to 3.5 MHz	10 kHz to 1.5 MHz
Insertion Loss	20 dB ±0.25 dB	20 dB ±0.25 dB
Bridging Loss	0.1 dB	0.3 dB up to 620 kHz 0.4 dB up to 1.5 MHz
Input Impedance		
Bridging		
At 1 MHz	13K ohms in parallel with 18 pf	
At 3.5 MHz	8K ohms in parallel with 20 pf	
Terminating Mode		
135 ohm	Reflection coefficient less than 2%	
600 ohm	Reflection coefficient less than 4%	
Maximum Input Level	+20 dBm	
Minimum Input Level	-90 dBm	

5. OPERATION

Receiving Information

5.01 When the Voltmeter is received, unpack it and inspect it carefully. Retain the shipping carton. Check the equipment received against the order. If the instrument is damaged or does not operate properly, contact your nearest Sierra regional manager or the Customer Service Department of Sierra Electronic Operation.

ADDRESS: Customer Service Department
Sierra Electronic Operation
Philco-Ford Corporation
3885 Bohannon Drive
Menlo Park, California 94025
Phone: (415) 322-7222
TWX: 910-373-1282

NOTE: Do not repackage damaged or faulty equipment for reshipment to Sierra Electronic Operation under the provisions of the Warranty without first contacting the Customer Service Department for specific instructions.

Primary Power

5.02 Input power to the 128A may be either 115 volts ac, 230 volts ac, or 24-28 volts dc. As shipped the standard instrument is connected to operate on 115 volt ac input power. For 230 Vac operation perform the following:

Step 1
Disconnect jumpers from pin 1 to pin 3 and from pin 2 to pin 4 on power supply board, part number B02051200.