CHAPTER 1

GENERAL INFORMATION

1.1 INTRODUCTION

This manual provides installation, operation and maintenance instructions for the Systron-Donner 6245A/6246A Microwave Frequency Counter. Instrument specifications, replaceable parts lists and standard options are included.

The 6245A/6246A Frequency Counters are precision test instruments that measure frequencies from 20 Hz to 26 GHz with features that include: high FM tolerance, high sensitivity, 52 dB Dynamic operating range and complete coverage of the frequency range with no complicated tuning. IEEE Systems Interface is available as option 05.

The 6245A/6246A measures frequencies from 20 Hz to 26 GHz in three ranges on seperate inputs. The low range channel (A INPUT) makes direct measurements from 20 Hz to 100 MHz. The mid range channel (B INPUT) makes prescaled measurements to 512 MHz. Microwave inputs to 18 GHz (26 GHz for the 6246A) are measured precisely and automatically by the use of the FLACTO* (Frequency Locked Automatic Computing Transfer Oscillator) technique on the C INPUT channel.

A highly visible 10-digit display features leading zero suppression, automatically positioned decimal point and off scale, gate, and remote indicators for unambiguous display of the measurement. An overload alarm for the C INPUT channel blinks the digital display when excessive input power is sensed. Any input level greater than +20 dBm will activate the overload alarm. Other features include front panel mounted input connectors and operator controls for sensitivity, manual reset and recycle rate.

Option 05 provides full IEEE-488 capability. Talk/Listen or Talk Only mode may be selected.

Other options include three higher stability oscillators for those applications requiring even greater stability.

1.2 SPECIFICATIONS

Table 1-1 lists the specifications applicable to both the 6245A/6246A.

TABLE 1-1 SPECIFICATIONS

FREQUENCY MEASUREMENT	
Frequency Range:	20 Hz to 26 GHz.
A Input:	20 Hz to 100 MHz.
B Input:	100 MHz to 512 MHz.
C Input:	500 MHz to 18 GHz (6245A) 500 MHz to 26 GHz (6246A)
A Input Direct	
Range:	20 Hz to 100 MHz.
Sensitivity:	25 mV rms.
Maximum Input:	250 Vrms 20 Hz to 10 kHz. 50 Vrms 10 kHz to 2 MHz. 5 Vrms 2 MHz to 100 MHz.
Impedance:	1M/25 pF.
Coupling:	ac.
Resolution:	1 Hz to 10 kHz selected in decade steps 1,10,100,1k,10k.
Accuracy:	±1 count ±time base accuracy.
Display:	Ten digits readout in MHz with automatically positioned decimal point. Leading zeros are suppressed.
Connector:	BNC female.
B Input ÷4 Prescaled	
Range:	100 MHz to 512 MHz.
Sensitivity:	-25 dBm.
Maximum Input:	+27 dBm, fuse protected.
Operative Dynamic Range:	52 dB.
Impedance:	50Ω nominal.
Coupling:	ac.
Resolution:	1 Hz to 10 kHz selectable in decade steps 1,10,100,1k,10k.

*FLACTO is a Trademark of Systron-Donner Corporation.

TABLE 1-1 SPECIFICATIONS (Cont'd)

B Input ÷4 Prescaled (Cont'd)	
Accuracy:	±1 count ±time base accuracy.
Display:	Ten digit readout in MHz with automatically positioned decimal point. Leading zeros are suppressed.
Connector:	BNC female.
C Input FLACTO ®	
Range:	500 MHz to 18 GHz (6245A). 500 MHz to 26 GHz (6246A).
Sensitivity:	-25 dBm 500 MHz to 10 GHz. -20 dBm 10 GHz to 18 GHz. -15 dBm 18 GHz to 24 GHz. -10 dBm 24 GHz to 26 GHz.
Maximum Useable Input:	+20 dBm prior to acquistion. +27 dBm after acquisition.
Maximum Input without damage:	+30 dBm.
Operative Dynamic Range:	52 dB to 10 GHz. 47 dB to 18 GHz. 42 dB to 24 GHz. 37 dB to 26 GHz.
Acquisition Time:	<60 ms + (1/R X N). N = Input frequency ÷100 MHz.
Amplitude Discrimination of 2 two frequencies:	20 dB amplitude separation (10 dB typical).
AM Tolerance:	Any modulation index provided the minimum voltage of the signal is not less than the specified sensitivity.
FM Tolerance:	10 MHz p-p, regardless of rate, worse case; >1 GHz at low rate.
SWR:	<2:1 to 10 GHz. <2.5:1 to 18 GHz. <3:1 to 26 GHz.
Kick Back Noise:	-65 dBm typical.
Impedance:	50Ω nominal.
Coupling:	ac.
Connector:	Type N female - 6245A. Type SMA - 6246A.
Resolution:	1 Hz to 10 kHz selectable in decade steps 1,10,100 1k,10k.
Accuracy:	±2 counts ±time base accuracy.

TABLE 1-1 SPECIFICATIONS (Cont'd)

C Input (Cont'd)	
Display:	Ten digit readout in MHz with automatically positioned decimal point. Leading zeros are suppressed.
TIME BASE	
Crystal Frequency:	10 MHz.
Time Base Stability:	Aging per month ±3 x 10^{-7}. Temperature ±1 x 10^{-6} over 0°C to 50°C range. Line variation ±5 x 10^{-8} for ±10% change.
Time Base Output:	1 MHz Out (rear panel).
External Time Base Input:	1 MHz to 10 MHz. 1 Vrms into 500Ω.
Internal/External:	Switch selectable (rear panel) internal or external time base.
GENERAL	
Readout Display:	0.3" LED ten digit in-line readout with decimal point. Automatic leading zero suppression. Gate indicator, Off Scale indicator for overflow and Remote indicator. Flashing display denotes pending overload (>20 dBm) or overload (>27 dBm).
Test:	Self test feature measures and displays 1 MHz time base frequency.
Lamp Test:	Illuminates all segments (shows 8's) on all digits and GATE, OS, REM indicators.
Reset:	Manual and Automatic.
Recycle Rate:	Continuously variable, 50 ms to 5 seconds plus Hold, time between measurement samples.
Operating Temperature:	0°C to 50°C.
Power Requirements:	100/115/125/215/225/230/240 volts ±10%, 48 to 400 Hz, 35 watts.
Dimensions:	4.75"H x 8.375"W x 13.5"D. 120.65mm H x 212.725mm W x 342.9mm D.
Weight:	12 lbs net; 20 lbs shipping 5.4431 kg net; 9.0719 kg shipping.