

# TYPE 1L60

SPECTRUM ANALYZER  
PLUG-IN UNIT

POS ↑  
CENTER FREQ

FINE  
DISP  
CAL

DISPERSION RANGE  
kHz/cm

DISPERSION RESOLUTION  
(PULL TO 100V)

10 20 50 100 200 500  
5 2 1

VIDEO FILTER

GAIN

TO RECORD INPUT

VERTICAL DISPLAY

LOG

LN

SQ LAW

VIDEO

≈ 50 dB

IF  
ATTEN dB

OFF

16

20

1 MHz CAL MARKER  
(PUSH)

150 MHz TO 250 MHz  
RF INPUT

SWEEP  
INPUT

+10V DC OUT  
20 mA MAX

SERIAL

SAMPLE

TEKTRONIX, INC.,

PORTLAND, OREGON, U.S.A.

# SECTION 1

## CHARACTERISTICS

### Introduction

The Type 1L60 Spectrum Analyzer described in this manual is designed for use in Tektronix oscilloscopes for the panoramic presentation of RF signals in the frequency range of 150 MHz to 250 MHz. The analyzer displays the frequency distribution of the applied signal along the horizontal axis of the oscilloscope CRT and displays the signal energy on the vertical axis.

The analyzer is designed for use in all Tektronix 530-, 540-,

550-, and 580-<sup>1</sup> Series Oscilloscopes. The analyzer plugs directly into the oscilloscope and derives all its power from the oscilloscope. The Type 1L60 can also be used in an external Plug-In Unit power supply such as the Tektronix Type 127 and Type 132 Power Supplies.

The following electrical characteristics apply at ambient temperature of 25° C ( $\pm 5^\circ\text{C}$ ) after an initial warm-up period of 20 minutes.

<sup>1</sup>A Tektronix Type 81 Plug-In Adapter must be used with 580-Series Oscilloscopes.

### ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirement	Supplementary Information
Input Frequency		
Range (Fixed Tuned)	150 MHz to 250 MHz	
Minimum Sensitivity <sup>2</sup>	1 kHz Resolution—130 dBm (0.07 $\mu\text{V}$ ); 100 kHz Resolution—110 dBm (0.7 $\mu\text{V}$ )	
Dial Accuracy	$\pm (2 \text{ MHz} + 1\% \text{ of dial reading})$	
Dispersion, kHz/CM RANGE		
Range	1 kHz/cm to 500 kHz/cm and 0 dispersion	In 1-2-5 sequence
Accuracy	$\pm 3\%$	
Linearity	$\pm 3\%$	
Dispersion, MHz/CM RANGE		
Range	0.2 MHz/cm to 10 MHz/cm	In 1-2-5 sequence
Accuracy	See Table 1-1	
Linearity	$\pm 3\%$	
Resolution		
Range	1 kHz to 100 kHz; uncalibrated	Can be cross-coupled with DISPERSION control or switched separately
IF CENTER FREQ Range		
	Coarse control      FINE control	
1-500 kHz/CM Dispersion	$\geq (\pm 2.5 \text{ MHz})$ $\geq (\pm 50 \text{ kHz})$	
2-5 MHz/CM Dispersion	$\geq (\pm 25 \text{ MHz})$ $\geq (\pm 1 \text{ MHz})$	
10 MHz/CM Dispersion	$\geq (\pm 10 \text{ MHz})$ $\geq (\pm 1 \text{ MHz})$	
IF GAIN Control Range	$\geq 50 \text{ dB}$	
IF ATTEN Control		
Range	0-51 dB	In 1 dB steps
Accuracy	$\pm 1 \text{ dB/dB}$	
Display Flatness (of a converted signal)	$\pm 1.5 \text{ dB}$	+ and -50 MHz from center frequency
Incidental FM IF	$\leq 200 \text{ Hz}$	
Internal Marker Reference Signal	1 MHz $\pm 100 \text{ Hz}$	Crystal-controlled

<sup>2</sup>Signal + Noise = 2 $\times$  Noise; 50  $\Omega$  load impedance; all voltages are RMS.

**Characteristics—Type 1L60**

Characteristics	Performance Requirement	Supplementary Information
Dynamic Range		
LOG	≥ 40 dB	
LIN	≥ 26 dB	≥ 6 centimeter display
SQ LAW	≥ 13 dB	
VIDEO INPUT Response	≤ 16 Hz to ≥ 10 MHz	
TO RECORDER Sensitivity	24 mV to 40 mV	With 6 centimeter LIN display. ≈ 600 Ω impedance.
+10 V OUT (Front-Panel)	10 V ± 5%	20 mA maximum load current.

**Environmental Characteristics**

The instrument will operate over a room-temperature range of 0°C to +50°C after 20 minutes warm-up time. Ventilation adequate for the main oscilloscope is adequate for this plug-in unit.

**Finish**

Front-panel is anodized aluminum.

**Connectors**

SWEEP INPUT	BNC
VIDEO INPUT	BNC
RF INPUT	BNC

+10 V DC OUT  
TO RECORDER

Banana Jack  
Miniature Phone Jack

**TABLE-1-1**

DISPERSION/CM Position	Accuracy
10 MHz	± 3%
5 MHz	± 3%
2 MHz	± 5% <sup>3</sup>
1 MHz	± 7% <sup>3</sup>
.5 MHz	± 10% <sup>3</sup>
.2 MHz	± 15% <sup>3</sup>

<sup>3</sup>Over the 50 MHz range of the IF CENTER FREQ control. The DISP CAL adjust can be reset to improve the accuracy of a specific IF CENTER FREQ control setting by using the front-panel 1 MHz CAL MARKER signal as a calibration signal.