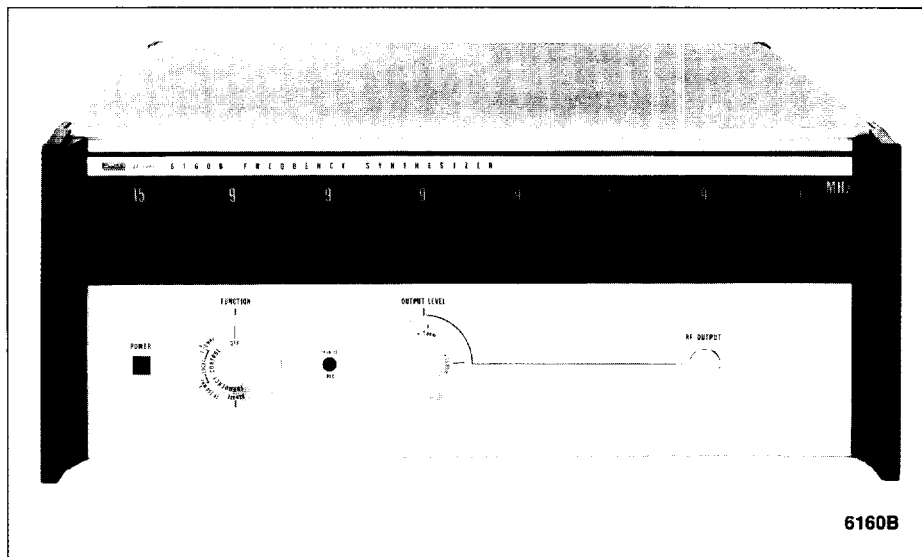


# Synthesized RF Signal Generators

6160B

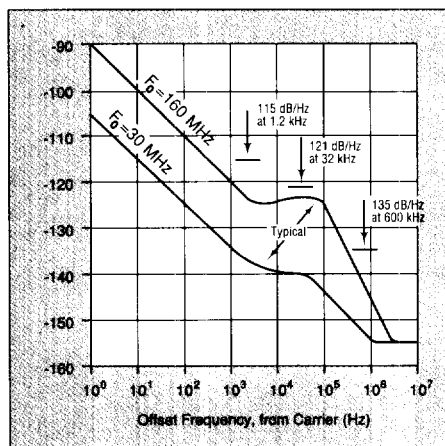


## 6160B Frequency Synthesizer

The Fluke 6160B Frequency Synthesizer is the industry's most popular VHF synthesizer because of its high spectral purity. It produces frequencies from 1 MHz to 160 MHz in two ranges: 1 MHz to 12 MHz and 10 MHz to 160 MHz. Frequency resolution is 0.1 Hz on the 12 MHz range and 1.0 Hz on the 160 MHz range.

A unique feature of the 6160B is that the highest internally-generated frequency is that of the output VCO, i.e., 80 to 160 MHz. This makes servicing easier, and eliminates UHF EMC problems. Since the output VCO operates from 80 to 160 MHz, frequency division is employed for coverage of lower frequencies. This results in improved spurious specifications for frequencies lower than 80 MHz. Phase noise is similarly reduced for lower bands.

Built-in remote programming is DTL/TTL, BCD, positive true logic or by contact closures. Programming of frequency is via 34 parallel lines, and a remote flag and power flag are provided. Switching is fast, output level is electrically adjustable. Compatibility with GPIB/IEEE-488\*-1978 is achieved using the Fluke 1120A Translocator and 6XXXA-529 Interface.



## Specifications

### Technical Specifications

Parameter		
<b>FREQUENCY</b>		
<b>High Band Range</b>	10 MHz to 160 MHz	
<b>Minimum Step</b>	1 Hz	
<b>Low Band Range</b>	1 MHz to 12 MHz	
<b>Minimum Step</b>	0.1 Hz	
<b>Local Control</b>	Front panel rotary switches	
<b>Remote Control</b>	BCD per decade, TTL, DTL positive true logic or contact closures. Logic "0" = 0 to 0.9V dc. Logic "1" = 2V to +5V dc or open circuit.	
<b>Spectral Purity</b>	<b>MHz</b>	<b>dBc</b>
<b>Non-Harmonic, Spurious</b>	1 to 20	-100
	20 to 40	-95
	40 to 80	-89
	80 to 160	-83
<b>Harmonic, Spurious</b>	<-25 dBc, typically <-30 dBc	
<b>Amplitude Noise**</b>	<-94 dBc (typical)	
<b>Absolute Phase Noise**</b>	<-62 dBc (typical)	
<b>Residual Phase Noise**</b>	<-74 dBc (typical)	
<b>Phase Noise*</b>	<b>Offset from Carrier</b>	<b>SSB Noise</b>
<b>Spectral Density</b>	1 Hz Bandwidth	
	1.2 kHz	<-115 dBc
	32 kHz	<-121 dBc
	600 kHz	<-135 dBc
<b>OUTPUTS</b>		
<b>Main Output</b>	Adjustable from +3 dBm to +13 dBm into 50Ω (0.3V to 001V rms) with front-panel control or external dc voltage. Level maintained ±1 dB into 50Ω	
<b>Other Outputs</b>	5 MHz at nominally 1V rms into 50Ω	
<b>Output Options</b>	Rear Panel, Opt -04	

\*Noise specifications are for frequencies from 80 MHz to 160 MHz. Noise performance improves for lower frequencies.

\*\* Measured in a 30 kHz band excluding the 1 Hz band centered on the signal frequency.

\*The terms GPIB and IEEE-488 may be used interchangeably throughout this catalog.

MISCELLANEOUS	
<b>Reference Frequency</b>	External, 5 MHz at 0 dBm to +16 dBm into 50Ω
<b>Level Control</b>	External, 0.1 to 0.8V dc nominal into >2 kΩ produces an output level change of from +3 dBm to +13 dBm
<b>Switching Speed</b>	<800 μs to be within 50 Hz of final frequency (applies for frequencies from 80 MHz to 160 MHz. Improves at lower frequencies)
<b>Internal 5 MHz Frequency</b>	<b>Option Aging Rate</b> -02 ±2 x 10 <sup>-9</sup> /day -05 ±5 x 10 <sup>-6</sup> /yr <b>Temp. Stability</b> 1 x 10 <sup>-8</sup> , 0°C to 50°C 1 x 10 <sup>-6</sup> , 0°C to 50°C

\*Noise specifications are for frequencies from 80 MHz to 160 MHz. Noise performance improves for lower frequencies.

\*\*Measured in a 30 kHz band excluding the 1 Hz band centered on the signal frequency.

## General Specifications

**Altitude:** To 3048 meters (10,000 feet), operating; 15,240 meters (50,000 feet), non-operating  
**Temperature:** 0°C to 50°C, operating; -62°C to +70°C, non-operating  
**Relative Humidity:** ≤80% to 50°C  
**Power:** 115V or 230V ac ±10%, switch-selectable, 50 to 440 Hz. 80W  
**Size:** 48.3 cm W x 17.8 cm H x 50.8 cm L (19 in W x 7 in H x 20 in L)  
**Weight:** 20.5 kg (45 lb)  
**Included with Instrument:** Manual, power cord, mating connector for programming input lines, serialized and dated calibration certificate

## Ordering Information

**Model** January 1990 prices  
**6160B\*** Frequency Synthesizer ..... \$10,450

### Options (for 6160B)

-02\* Frequency Std. 2x10<sup>-9</sup>/day ..... \$ 1030  
 -04 Rear Panel RF Output ..... 60  
 -05\* Frequency Std. 5x10<sup>-6</sup>/year ..... 480  
 -522K 1120A Interface, field installable ..... 325  
 -529\*\* IEEE-488 Interface ..... 380

\*Option -02, -05 or an external 5 MHz time base is required. Option -02 and -05 Frequency Standards are installable at Factory

\*\*Requires 1120A IEEE-488 Translator. Includes 6XXXA-522K and Y7205 Cable

## Accessories (Also see Section 17)

**1120A** IEEE-488 Translator ..... \$ 640  
**Y7205** 6 ft Ribbon Cable for -522K ..... 75  
**Y9111** 3 ft (0.93m) 50Ω BNC Cable ..... 20  
**Y9112** 6 ft (1.85m) 50Ω BNC Cable ..... 20  
**M07-205-600** 7" Rack Adapter ..... 110  
**M00-280-610** 24" Rack Slides  
 (Rack Adapter required) ..... 130

## Customer Support Services

### Warranty

One-year product warranty. See Section 16 for further information on warranty terms and conditions.

### Extended Warranty

A 10% discount is available when you order the following at the time of the instrument purchase or when ordered within the factory warranty period.

**SC1-6160B** Repair ..... \$ 375  
**SC2-6160B** Calibration ..... 63  
**SC3-6160B** Full Service ..... 399  
**SC4-6160B** Performance Verification-Plus 38

Note: Incoming and/or outgoing calibration readings are available as an option.