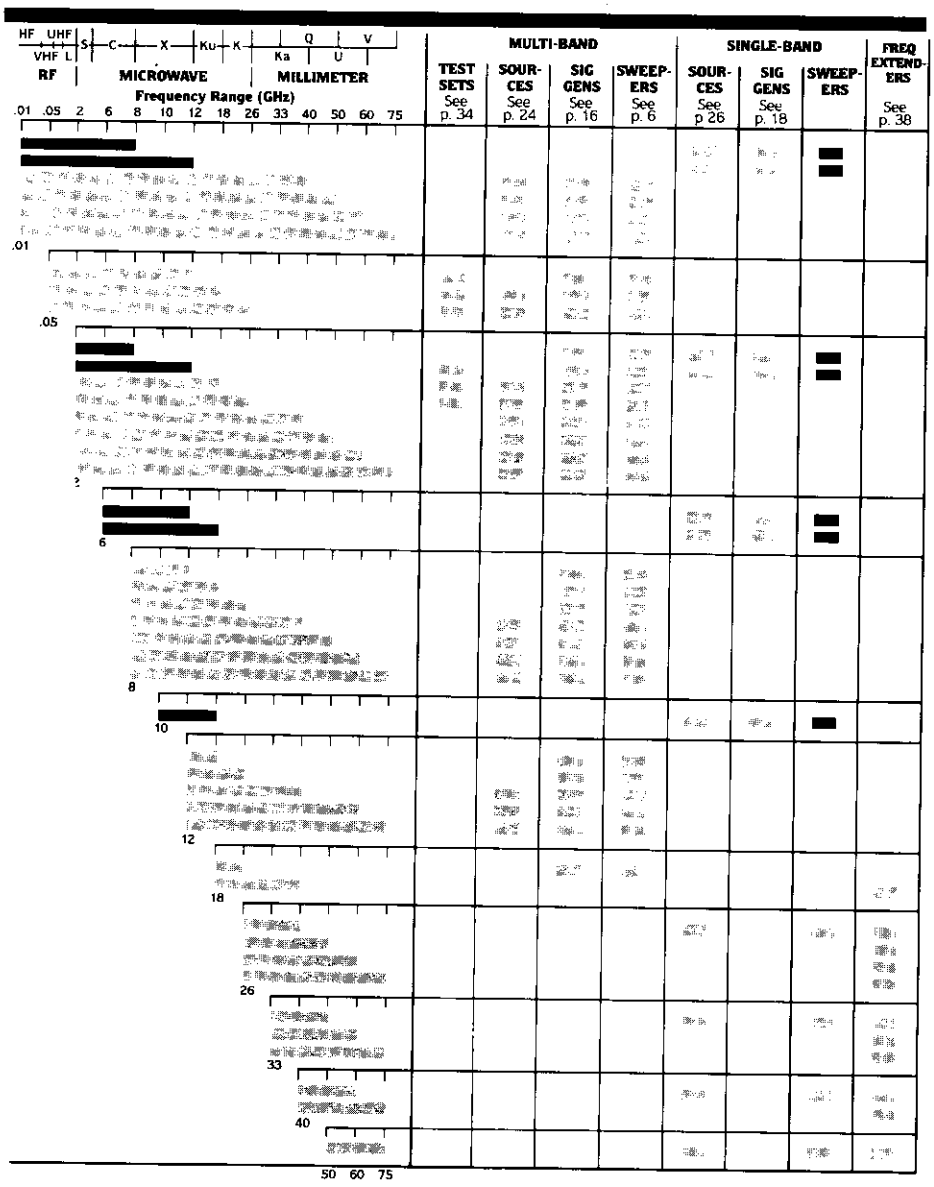
Series 610

Features

- High Speed Sweeps
- F1-F2, △CF and M1-M3 Modes
- 8 Markers
- Step and Lock Sweep
- Choice of Frequency Bands
- Synthesizer Accuracy
- +10 to -119dBm Leveled Output
- AM, FM and Pulse Modulation
- Non-volatile Program Storage
- IEEE 488 GPIB
- Network Analyzer Compatible

Model 610/.01-8



Series 610 single-band microwave sweepers have become known as Giga-Sweepers; a unique name for a very unique series of instruments. Unique from the standpoint that they offer complete multi-mode sweeper operation in both fast analog and step and lock digital formats for high thru-put testing, tuning and troubleshooting of microwave components and systems. Unique from the standpoint that they offer the frequency accuracy, stability, resolution and spectral purity of indirect synthesis in the CW mode of operation for applications requiring clean, stable signal sources. Unique from the standpoint that they feature wide range (+10 to -119dBm) output power control with 0.1dB resolution and may be frequency, amplitude or pulse modulated, adapting them to your most stringent signal generator requirements. Finally, unique in that they cost no more than the traditional, single-purpose, sweep generators and sweep oscillators that you have been using.

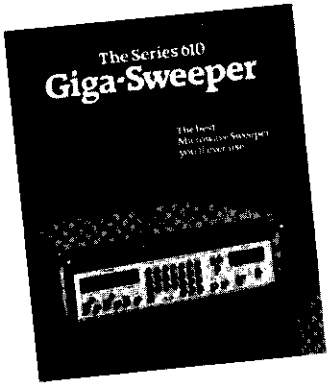
Designed to be the general purpose, workhorse stimulus instrument for testing applications in the fields of telecommunications, radar and electronic warfare, the Series 610 features a unique implementation of microprocessor controlled indirect synthesis technology which eliminates the requirement for an expensive YIG-tuned oscillator in the reference loop, thus greatly reducing the cost of the synthesized instrument.

Specially designed circuitry utilizing multiplying DACs and a high speed, 0.025% resolution ramp generator provides the fast analog sweep capability of the Series 610, while digital sweep is provided by its microprocessor controlled step and lock operation.

Amplitude, frequency and pulse modulation, either individually or simultaneously, and accurate, 0.1dB resolution output level control are provided by a single module, a precision step attenuator and stored correction factors over the frequency range of each instrument.

Multi-purpose Series 610 Giga-Sweepers offer a choice of frequency ranges that overlap the standard operational bands of microwave components and systems. Any single-band application in EW, Radar, telecommunications or other microwave discipline will find a Series 610 instrument to meet its frequency requirements.

For more detailed information. . .



Series 610 Brochure
No. 2 on Information Request Card

Specifications & Operating Performance

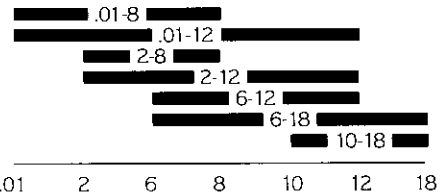
Options — page 14
Accessories — page 40

MODEL NUMBER

610 / FA — FB
- FB — Maximum Frequency
- FA — Minimum Frequency
- 610 — Series Designator

FREQUENCY CHARACTERISTICS

Range (GHz):



Note: Model 610/6-12 covers the range of 5.4 to 12.5GHz

Resolution: 1MHz (1kHz with Option 03
Settable Frequency Parameters:
- All CW frequencies
- Sweep start (F1) and sweep stop (F2)
- Sweep center (CF) and sweep width (ΔF)
- All markers (5 via the front panel, 8 via the IEEE 488 bus)

Analog Sweep Operation

Sweep Modes and Limits (Sweeps upward in frequency)
- Start/Stop Sweep: F1 to F2; FA ≤ F1 < F2 ≤ FB
- CF Sweep: ΔF symetrically about CF; FA ≤ (CF-(ΔF/2)) < (CF+(ΔF/2)) ≤ FB
- ΔM Sweep: M1 to M3; FA ≤ M1 < M3 ≤ FB

Sweep Functions: Automatic recycle, single sweep or triggered single sweep
Sweep Time: Approx 10msec to 100sec
Max Sweep Rate: 600MHz/msec
Sweep Accuracy (First and last frequency): ± 30MHz
Sweep Linearity (after first 100 μsec): ± 5 MHz
Sweep Resolution: Approx 128kHz for sweep widths <524MHz, 2MHz for sweep widths >524MHz
Proportional Output: 0.5V/GHz

Digital Sweep Operation

Sweep Mode and Limits (Sweeps upward or downward in frequency)
- Start/Stop Sweep: F1 to F2; FA ≤ F1 < F2 ≤ FB
- CF Sweep: ΔF symetrically about CF; FA ≤ (CF-(ΔF/2)) < (CF+(ΔF/2)) ≤ FB
- ΔM Sweep: M1 to M3; FA ≤ M1 < M3 ≤ FB

Sweep Functions: Automatic recycle, single sweep, triggered single sweep, sweep stop, single step and triggered single step
Step Size: 1, 10, 100 or 1000MHz (plus 1, 10 or 100kHz with Option 03)
Sweep Time: 10msec/step to 10sec/step
Sweep Trigger Input (Analog or digital sweep): TTL low to initiate
Marker/Blanking Output (Analog or digital sweep): Z-axis modulation for oscilloscope
Sweep Output (Analog or digital sweep): 0 to +10V, proportional to frequency between set sweep limits

CW Operation

Frequency Accuracy: Same as time base
Frequency Stability: Same as time base
Time Base (Internal): 10MHz, $<1x10^{-6}$/year ($<1x10^{-9}$/day with Option 06)
Time Base (External): 10MHz + $1x10^{-6}$ or better
Time Base Output: Buffered 10MHz, derived from internal or external time base

SPECTRAL PURITY

Harmonics[1], Subharmonics: <-40dBc at frequencies >2GHz, <-30dBc at frequencies <2GHZ
Spurious (Nonharmonics): <-55dBc at frequencies >2GHz, -50dBc at frequencies <2GHz
Power Line/Fan Related: <-45dBc (typ)
Residual FM (50Hz-15kHz BW, CW mode): <200Hz, RMS
SSB Phase Noise (1Hz BW, 10kHz offset, CW mode): <-75dBc

OUTPUT CHARACTERISTICS

Maximum Leveled Output[2]: +10dBm (10mW)
Minimum Leveled Output: -119dBm
Resolution: 0.1dB
Accuracy and flatness: ± 2dB
External ALC: Negative detector
RF On/Off: Front panel or IEEE 488 bus

MODULATION CHARACTERISTICS — May be operated individually or simultaneously

Pulse Modulation (PM)

Internal: 1kHz square wave
External
- Repetition Rate: 10Hz to 1MHz
- Pulse Width: >50nsec
- Input Required: TTL level

On/Off Ratio: >80dB
Rise/Fall Times: <25nsec
Overshoot, Undershoot and Ringing: ± 2dB
Settling Time (to within ± 1dB): <100nsec

Amplitude Modulation (AM)

Internal: 1kHz sine wave
External
- Rate: 10Hz to 10kHz (100kHz typ)
- Sensitivity: 1V, p-p, for 50% modulation at 1kHz rate
- Distortion: <10% (5% typ) at 50% depth and 1kHz rate

Depth: 0 to >82%
Depth Indicator: 3 digits

Frequency Modulation (FM)

Internal: 1kHz triangle wave
External
- Rate: 10Hz to 1MHz
- Sensitivity: ± 1.0V, peak, for maximum deviation
- Distortion: <5% at maximum deviation and 500kHz rate

Deviation: ± 5MHz, peak
Deviation Indicator: 3 digits

NON-VOLATILE STORE/RECALL

Information Stored: All CW, sweep and output power parameters
Capacity: Nine complete panel set-ups

GENERAL INFORMATION AND OPTIONS

Remote Interface: IEEE STD 488-1978
Environmental: Complies with MIL-T-28800C, Type III, Class 5, Style E
Reverse Power Protection (Models 610/2-8 and /6-12 only): Option 19
Rear Panel RF Output Connector — Option 22

[1] may degrade to -10dBc (typ) above 5.3GHz in Models 610/.01-12 and /2.12

[2] +6dBm, Model 610/2-12
+4dBm, Model 610/.01-12
+3dBm (+5 typ), Model 610/6-18