KEYSIGHT TECHNOLOGIES (AGILENT HP)

8920A

The Keysight (formerly HP/Agilent) 8920A is a highly integrated RF communications test set designed for the service, repair, and manufacture of cellular and land mobile radios. Combining over 20 discrete instruments into one compact, portable unit, it provides extensive transmitter and receiver testing capabilities up to 1 GHz, including AM, FM, and SSB modulation analysis, a synthesized signal generator, audio analyzers, and options for full-span spectrum analysis and signaling emulation.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2), RS-232, Parallel Printer Port (typically with Option 003)
Display	5-inch green phosphor monochrome CRT

Physical

Power Supply	90 to 132 V AC or 198 to 264 V AC, 48 to 440 Hz, 150 VA maximum
Operating Temperature	0 to +55 °C °C
Dimensions (W×H×D)	330 mm × 188 mm × 456 mm mm
Weight	16.8 kg

RF Signal Generator Specifications

Frequency Range (Standard)	30 MHz to 1000 MHz
Frequency Resolution	1 Hz
Output Power Range (RF IN/OUT Port)	-137 dBm to -20.5 dBm (into 50 Ω)
Output Power Range (DUPLEX OUT Port)	-127 dBm to +3.5 dBm (into 50 Ω)
Output Power Resolution	0.1 dB
Output SWR (RF IN/OUT Port)	< 1.25 (for frequencies up to 1000 MHz)
Output SWR (DUPLEX OUT Port)	< 2.0 (for frequencies up to 1000 MHz)
Harmonics	< -30 dBc
Non-harmonics Spurious	< -55 dBc (at > 20 kHz offset)
FM Deviation Range	0 to 100 kHz (frequency dependent)
AM Depth Range	0 to 90%
AM Depth Accuracy	±5% of setting + 1.5% AM (at 1 kHz rate)

RF Analyzer Specifications

RF Power Meter Continuous Range	1 mW to 60 W (continuous), up to 100 W (for 10 seconds)
RF Power Meter Accuracy	±10% of reading ± 1 count (±0.4 dB)
Frequency Counter Resolution	1 Hz
FM Demodulation Accuracy	±4% of reading (at 1 kHz rate, 5 kHz deviation)
AM Demodulation Accuracy	±5% of reading (at 1 kHz rate, 30% depth)

Audio Source (AF Generator)

Audio Source Count	2 independent internal variable synthesizers
Frequency Range	DC to 25 kHz
Output Level Range	0.1 mV to 4 Vrms (into 600 Ω)
Output Level Resolution	0.1 mV (for level < 100 mV) or 3 digits
Total Harmonic Distortion (THD)	< 0.12% (at 1 kHz, 1 Vrms into 600 Ω)

Audio Analyzer

Audio Counter Frequency Range	20 Hz to 400 kHz
AC Voltmeter Measurement Range	100 µV to 30 Vrms
AC Voltmeter Measurement Accuracy	±3% of reading (20 Hz to 100 kHz)
DC Voltmeter Measurement Range	100 mV to 42 V
DC Voltmeter Measurement Accuracy	±1.0% of reading + 45 mV
Distortion (THD+N) Range	0.1% to 100% (at 1 kHz)
SINAD Measurement Range	0 to 46 dB (at 1 kHz)
SINAD Measurement Accuracy	±1 dB
Audio Filters (High-Pass)	50 Hz, 300 Hz
Audio Filters (Low-Pass)	300 Hz, 3 kHz, 15 kHz, 20 kHz
Audio Filters (De-emphasis & Weighting)	750 µs de-emphasis, C-Message, CCITT
AUDIO IN Input Impedance	100 kΩ (nominal)
AC Voltmeter Frequency Range	20 Hz - 100 kHz

Oscilloscope

Oscilloscope 3dB Bandwidth	2 Hz to 50 kHz
Oscilloscope Vertical Sensitivity Range	10 mV/div to 10 V/div
Oscilloscope Timebase Range	10 µs/div to 100 ms/div (in 1-2-5 sequence)

Signaling and Demodulation Capabilities

Signaling Encoders/Decoders Supported	Tone Sequential, DTMF, digital paging (CCITT, POCSAG, ZVEI), cellular signaling, trunking
Cellular Formats Emulated	Analog cellular standards (AMPS, TACS, JTACS, NMT etc.)

System Interfaces & Connectivity

RF IN/OUT Connector Type	Type-N female (50 Ω)
DUPLEX OUT Connector Type	BNC female (50 Ω)
ANT IN Connector Type	BNC female (50 Ω)
Audio In/Out Connectors	BNC female
External Reference Input Frequency	10 MHz (accepts 1, 2, 5, or 10 MHz reference signal)
External Reference Output Frequency	10 MHz
Memory Card Slot Type	PCMCIA Type I or II (for program and setup storage)

Physical and Environmental

Storage Temperature Range	-55 to +75 °C

Options & Upgrade Configurations

Option 001	High stability timebase
Option 004	Tone/Digital Signaling Encoder/Decoder
Option 009	CCITT Weighting Filter
Option 102	Spectrum Analyzer with Tracking Generator

RF Generator

RF Generator Level Accuracy (RF IN/OUT)	±1.2 dB (level >= -120 dBm)
RF Generator Level Accuracy (DUPLEX OUT)	±1.0 dB (level >= -127 dBm)
FM Modulation Rate	DC to 25 kHz (1 dB bandwidth, DC coupled); 20 Hz to 25 kHz (AC coupled)
AM Modulation Rate	20 Hz to 25 kHz (3 dB bandwidth)
RF Generator Residual FM	<7 Hz rms (CCITT), <20 Hz rms (300 Hz to 3 kHz) for fc < 1000 MHz
RF Generator Residual AM	<0.05% rms (300 Hz to 3 kHz bandwidth, fc < 1000 MHz)
RF Generator SSB Phase Noise	<-110 dBc/Hz (at 20 kHz offset, fc < 1000 MHz)

RF Analyzer

RF Analyzer Frequency Range	30 MHz - 1000 MHz
RF Analyzer Tuning Resolution	1 Hz
RF Power Meter Maximum Short-Term Power	100 W (for up to 10 seconds per minute on RF IN/OUT)
Frequency Counter Range	10 MHz - 1000 MHz
Frequency Counter Accuracy	±1 Hz + timebase accuracy
Frequency Counter Sensitivity (RF IN/OUT)	5 mW
Frequency Counter Sensitivity (ANT IN)	100 µV
FM Demodulation Distortion	< 1% (at 1 kHz rate, 6 kHz deviation)
AM Demodulation Distortion	< 2% (at 1 kHz rate, 30% AM)
FM Demodulation Range	0 to 150 kHz deviation
AM Demodulation Range	0 to 95% depth

Spectrum Analyzer (Option 002/102)

Spectrum Analyzer Frequency Span	10 kHz - 10 MHz (plus zero span)
Spectrum Analyzer Resolution Bandwidth (RBW)	300 Hz, 1 kHz, 3 kHz, 30 kHz, 300 kHz
Spectrum Analyzer Display Range	80 dB
Spectrum Analyzer Log Scale	1, 2, 5, 10 dB/div

Timebase

Standard Timebase Temperature Stability	< ±2.0 ppm (0 °C to 55 °C)
Standard Timebase Aging	< 2.0 ppm/year
Option 001 Timebase Temperature Stability	< ±0.05 ppm (0 °C to 55 °C)

Electrical & Environmental

Line Voltage	90 - 132 Vac / 198 - 264 Vac
Line Frequency	48 - 440 Hz
Power Consumption	300 VA (maximum)

Audio Measurements

Audio Counter Accuracy	±0.02% ± timebase accuracy
Audio Counter Input Level Range	20 mV to 30 V rms

Options

Option 010	400 Hz High-Pass Filter
Option 011	CCITT weighting filter
Option 012	Adds Tracking Generator to Spectrum Analyzer (requires Option 002)
Option 013	C-Message weighting filter
Option 014	600 Ohm audio input/output impedance

TECHNOLOGY

Superheterodyne RF transceiver with synthesizer control

APPLICATIONS

Land Mobile Radio (LMR), Cellular Phone Testing, RF transmitter and receiver maintenance, and general RF analysis