MOBILE/CELLULAR RADIO TEST SETS
GSM900, DCS1800, AND PCS1900 Test Sets
HP 8922A, 8922B, 8922S, 89922M

- Complete GSM/DCs mobile station test sets
- Designed to minimize prodution/service costs
- Built-in toolkit of instruments
- E-GSM capability

- Fast and easy to use
- Accurate and repeatable GSM measurements
- Built-in IBASIC controller for easy automation

HP 8922M

NEW

DESIGNED FOR
HP-IB
SYSTEMS

HP8922A/B/S/M GSM Test Sets

The HP 8922A, 8922B, 8922S, and 8922M are integrated test solutions for the prodution and servicing of GSM900, DCS1800, and PCS1900 radios. These test sets are based on a common, expandable platform. The HP 8922A is a tool box with the necessary hardware to test the RF characteristics of GSM modules. For base station testing, the HP 8922B builds on this platform by adding a large memory and reference section to provide baseband data patterns to control the built-in 0.3GMSK source. The HP 8922S is a standalone GSM mobile station tester. For service applications it includes a GSM base-station emulator and all the signaling capability to fully test a mobile without additional equipment. For manufacturing applications, the HP 8922M adds high-speed testing and additional flexibility to maximize production throughput.

Minimize Production/Service Testing Costs

The HP 8922M is built for manufacturing, with accurate and repeatable measurements; it provides the minimum test times under HP-IB remote control. The HP 8922S is tailored to the demanding needs of incoming inspection and mobile repair. It has all of the ingredients necessary to minimize the cost per phone, a rich set of features which balances fast testing with a built-in toolkit of instruments and automatic test software. Features are bound together with an intuitive menu-driven user interface. Sharing a common RF measurement architecture, the HP 8922S/M guarantees consistent test results during each stage of a phone's life, minimizing the chances of good phones being rejected at incoming inspection, maximizing the quality of new and repaired phones. Both products are developed from the industry standard HP 8922H.

GSM Radio Test Solutions

The HP 8922 contains a complete set of instrumentation for testing the RF sections of GSM radios. In addition to the frequency agile 0.3 GMSK RF generator, the RF analyzer has an agile local oscillator, coherent data demodulator, pulse demodulator, FM demodulator, global method analyzer for phase and frequency error, synthesized spectrum analyzer, and pulse power meter. The HP 8922B adds a large programmable RAM and phase-lock-loop timing generator for generating long GSM data patterns. The HP 8922S/M adds a bit-error-rate tester (BERT) for performing GSM receiver measurements, channel CODEC, and call control protocol to setup a phone call and maintain the link while performing measurements. Echo mode is facilitated by the voice CODEC for functional testing of a mobile, and the electrical man machine interface (EMMI) is implemented for controlling the mobile and supporting the digital audio interface (DAI). Flash memory on the HP 8922M allows easy upgrades.

Complete Tool Set

Aside from their complete complement of GSM measurements, the HP 8922 contains general-purpose tools useful for module test, troubleshooting, and debugging activities. The tools include a digital oscilloscope, CW RF synthesizer, spectrum analyzer, CW RF frequency counter, CW and peak RF power meter, ac voltmeter, dc voltmeter, 1 kHz distortion/SINAD meter, audio frequency counter, and synthesized audio source. The sum of these capabilities makes the HP 8922 an extraordinarily powerful tool for the manufacture, installation and repair of GSM radio equipment.

HP 83212C GSM/DCS1800/PCS1900 Mobile Test Software

The HP 83212C is an easy-to-use software solution for automatic testing of GSM900, DCS1800 and PCS1900 mobile stations. Running on the HP 8922S/M's built-in IBASIC controller, the HP 83212C offers a comprehensive set of tests ideal for incoming inspection and repair of GSM phones. Its flexibility and modularity allow you to select and change test sequences, test parameters, and pass/fail limits without programming expertise. Procedures can be simply saved on RAM cards and distributed to colleagues, guaranteeing consistent test methods. All test results are displayed on the screen and can be documented with hard-copy printouts when an external printer is added. Three levels of testing are available with the HP 83212C: manual mobile station troubleshooting, quick functional checkout, and full parametric testing. Automating your measurements provides repeatable results while allowing the user to test more mobile stations in less time. This increase in throughput lowers your testing cost.

HP 83220A/E DCS/PCS Test Sets

Adding an HP 83220A/E expands the capabilities of the HP 8922 family to comprehensively test DCS1800 and PCS1900 equipment. The HP 83220E provides a cost-effective solution for mobile testing. The HP 83220A tests both mobiles and base stations. All features of the HP 8922 are retained.

HP 8922S/M Specifications

RF Generator

Frequency Range: 10 MHz to 1000 MHz
Frequency Resolution: 1 Hz
Switching Speed: 577 μs
0.3 GMSK Modulation[1]: External clock and data
Pulse Modulation[1]: Normal and 30 dB
Output Power: −16 to −127 dBm

RF Analyzer

Frequency Range: 10 MHz to 1000 MHz
Frequency Resolution: 1 Hz (100 kHz in hop mode)
Switching Speed: 577 μs
Coherent Data Demodulation[1]: 0.3 GMSK at 270.833 Kb/s, 1 timeslot/frame
Analog Demodulation[1]: FM and pulse
Global Method: rms and peak phase error, frequency error
Amplitude Envelope: Rise, fall, and burst flatness over useful bits
Peak Transmitter Power: +10 dBm to +45 dBm (− 5 dBm to 41 dBm on HP 8922F/H)
Output RF Spectrum Measurements[2]: Due to modulation and switching transients
CW Frequency Counter: 10 MHz to 1000 MHz

Spectrum Analyzer[2]

Frequency Range: 10 MHz to 1000 MHz
Frequency Accuracy and Stability: Same as timebase
Display Range: 80 dB
Other Features: External trigger, marker

Digital Oscilloscope

Frequency Range: 2 Hz to 50 kHz
Sweep Times: 10 μs to 100 ms in 1, 2, 5, 10 steps

Audio Analyzer

Frequency Range: 20 Hz to 400 kHz
AC Voltage Range: 0 to 30 V$_{rms}$
DC Voltage Range: 100 mV to 42 V
THD + Noise: 1 kHz ± 5 Hz
Sinad: 1 kHz ± 5 Hz

Audio Source

Frequency Range: DC to 25 kHz
Output Level Range: 0.1 mV$_{rms}$ to 4 V$_{rms}$

Reference Oscillator

External Reference Input Frequency: 13, 10, 5, 2, or 1 MHz
External Reference Output: 10 and 13 MHz

Remote Programming

HP-IB: IEEE 488.2
RS-232: 300, 1200, 2400, 4800, 9600, and 19200 baud

Internal Programming

Programming Language: Hewlett-Packard Instrument BASIC
Program Storage: 32 KB to 512 KB external memory cards

General Specifications

Size: 426 mm W x 177 mm H x 574 mm D (16.75 in x 7 in x 23 in)
Weight: 32 kg (70 lb)
Operating Temperature: 0˚ to + 55˚ C
Storage Temperature: − 40˚ to + 75˚ C
Power: 100, 120, 220, 240 Vac, 48 to 440 Hz, ±10% of line voltage

GSM Functionality

Broadcast Channel Capability: BCCH + CCCH or BCCH + CCCH +SDCCH/4
Control Channels: BCCH + CCCH, BCCH + CCCH + SDCCH/4, SDCCH/8 (non-hopped), SACCH/FACCH
Traffic Channels: TCH/FS
Call Control Capabilities: BS originated call (FS), MS originated call (FS), MS camp on, BS call disconnect, MS call disconnect
Timing: Auto, manual, uplink-downlink offset measurement
Hopping: Cyclic only, two MA tables with offsets
Digital Audio Interface (DAI)[1]: Normal operation and test of acoustic devices and A/D & D/A
Electrical Man Machine Interface[1]: Control via HP-IB
Speech Encoding/Decoding: Full rate speech (FS)
Echo Mode: HP 8922S: 1 second delay
HP 8922M: user selectable delay, 0 to 5 seconds
Bit/Frame Error Rate Measurements: Class Ia, Ib, and II bits
MS Power Output Level Control: 0 to 19, 30, 31 with RF analyzer auto adjust
Measurement Coordination: Flexible control of burst, ARFCN, and timeslot
SACCH MEAS Results: RXLEV, RXQUAL, timing advance
SMS Cell Broadcast, IMSI attach/detach

HP 8922B Additional Specifications

Data Buffer

Frame Control RAM: Memory for 102 unique GSM frames
Data RAM: 64 KB FIFO for active timeslot (load via GPIO)
Hop RAM: 32 KB for controlling HP 8922B frequency hopping

GSM Reference

External Reference Input Frequencies: 13, 10, 5, 2, 1 MHz, bit clock, or frame clock

HP 83220E Specifications

Frequency Range: 1805 to 1990 MHz

Ordering Information	Price
HP 8922A GSM RF Test Set	$40,000
HP 8922B GSM BS Test Set	$45,000
HP 8922S GSM MS Service Test Set	$27,000
HP 8922M GSM MS Test Set	$38,000
HP 83212B GSM/DCS1800 Mobile Station Test Software	$4,060
HP 83220A DCS/PCS MS/BS Test Set	$25,900
HP 83220E DCS/PCS MS Test Set	$5,000
Options for HP 8922A, 8922B, 8922S, and 8922M	
Opt 001 High-Stability Timebase	+$1,810
Opt 002 Transit Protection (front panel cover, accessory pouch, and extented rear feet)	+$690
Opt 003 Extended Repair Service	
Options for HP 8922A and 8922B	
Opt 910 Provides a total of two sets of Operation Manuals and Service Manuals	+$510
Opt 913 Rack-mount Flange Kit	+$33
Opt 915 Adds Service Manual	+$255
Options for HP 8922S and 8922M	
Opt 006 Spectrum Analyzer	+$2,500
Opt 007 GSM900 Test SIM Card	+$100
Opt 008 GSM900 Test Micro SIM Card	+$100
Opt 012 GSM/DCS1800/PCS1900 MS Test Software (HP 83212C)	+$1,500
Options for HP 83220A/E and 8922S/M	
Opt 0B1 Provides a total of two sets of Users Guides and Service Manuals (Users Guide only for A/E)	+$600
Opt AX4 Rack-mount Flange Kit	+$32
Opt 0B3 Adds Service Manual	+$250

[1]Not applicable to HP 8922S
[2]Requires Option 006, Spectrum Analyzer, on HP 8922S/M

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