Agilent 11807A/E

11807A Radio Test Software for the 8920A RF Communications Test Set

11807E Radio Test Software on PCMCIA Cards for the 8920B RF Communications Test Set

Product Overview

Applications

Trunked Mobile Testing

- Enhanced Digital Access Communications System (EDACS) trunked mobile radio

Cellular Phone Testing

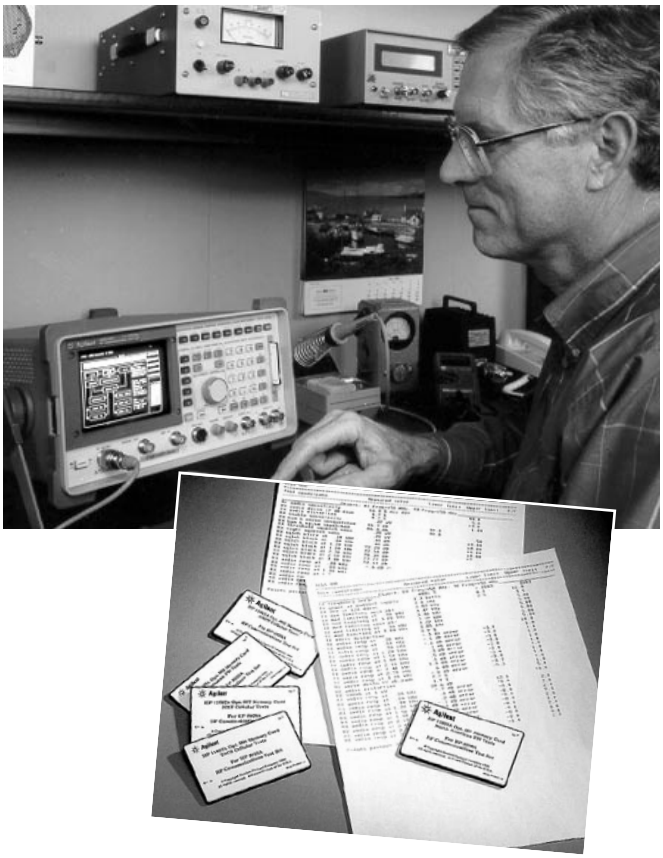
- AMPS/EAMPS/NAMPS
- TACS/ETACS

System Support Tests

- Cable fault location
- Intermodulation products calculation
- Field strength measurement
- Frequency scanning
- Automated Save/Recall

Radio Testing

- FM
- ΦM
- AM



Easy-to-Use Software Solution for Automatic Testing

The Agilent Technologies 11807A radio test software is an easy-to-use software solution for automatic testing of radio transceivers with the Agilent 8920A test set.

The 11807A offers a complete selection of tests on EPROM memory cards for land mobile radios, cellular phones, and communications systems.

The 11807E radio test software is designed to run on the 8920B RF communications test set from PCMCIA memory cards.

The flexibility and modularity of the 11807A/E radio test software allows you to change the tests to be run, test parameters, test frequencies, and pass/fail limits by filling in simple on-screen menus. Test conditions for different radios can be stored on memory cards and are easily loaded for testing.

Agilent Technologies

Innovating the HP Way

Flexibility Provides a New Way to Perform Automatic Tests
While other service monitors offer sequencing, learn modes, or hard-coded test capability, the flexibility of the Agilent 11807A/E provides you with a new way to perform automated radio tests with a service monitor.

You perform the tests you want to perform, at the frequencies and pass/fail limits you desire.

Radio Manufacturing
The operating speed of Agilent 11807A/E radio test software makes it useful for production environments. With pass/fail readouts and typical test times of one to two minutes with quick general tests, your production line can cut test time and increase your confidence that all radios are meeting specification.

All parameters, specifications, and test conditions for a particular type or model of radio can be stored and identified with a single file name. Changing radio parameters and test conditions is as simple as entering a new file name. Compared to the 8920A and stand-alone instruments, the 8920B using 11807E software is the fastest test set for manufacturing and service.

Radio Service
The Agilent 11807A/E software allows technicians to automatically perform radio checkout and final test with documented results. This capability decreases radio test and repair time by aiding the technician in determining the problem and then verifying that the radio is operating correctly once it has been repaired. The test software also helps ensure that radios are tested to a consistent set of procedures.

Select from Flexible Testing Modes

Quick Functional or Full Parametric Testing

Quick functional RX and TX testing is available for fast radio characterization. By selecting the quick functional RX or TX tests, your transceiver can be characterized in one to two minutes with documented pass/fail results. Quick functional tests can be performed on a single channel or multiple channels.

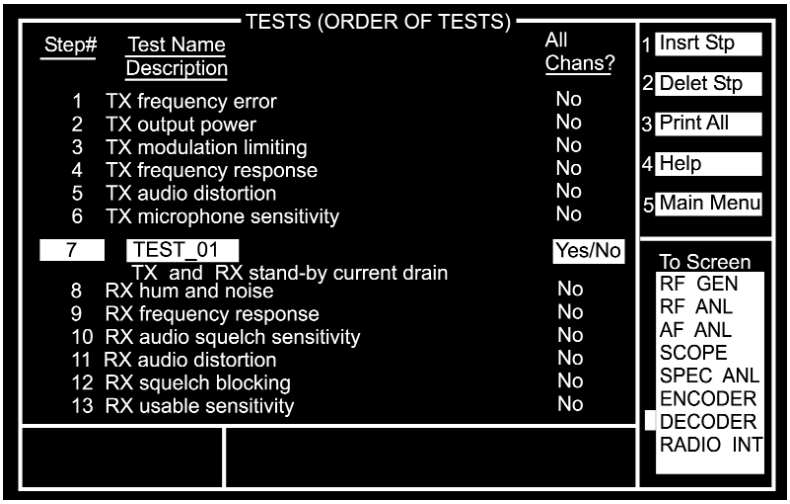
Full parametric testing is available for more complete characterization of your transceiver. A complete list of individual tests is available. Select and run only those tests you need to perform on your transceiver. Parametric tests can also be performed on a single channel or multiple channels.

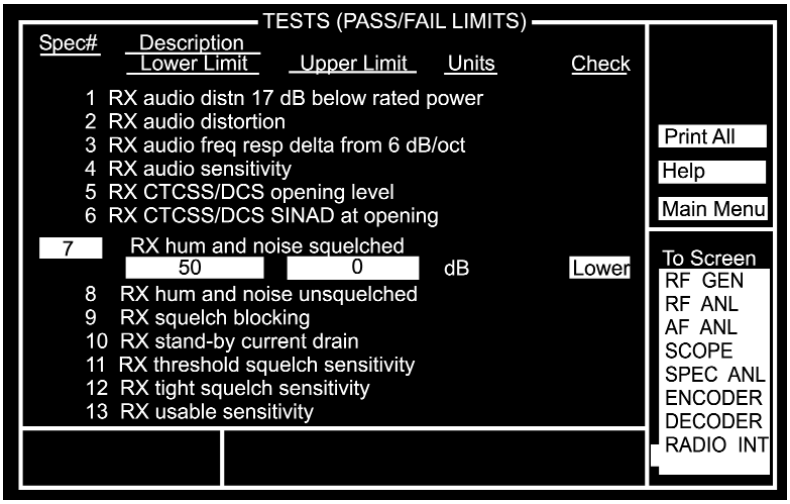
Set Your Own Pass/Fail Limits

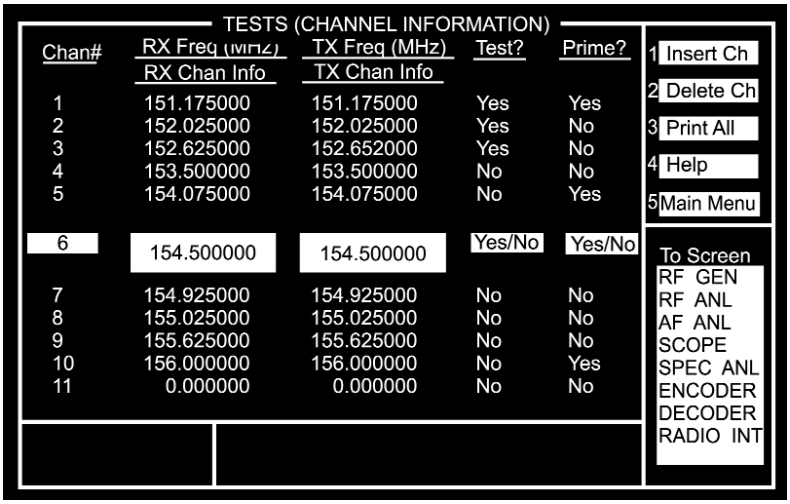
A comprehensive specifications file allows you to completely define the standards to which each transceiver is tested. The program automatically does pass/fail testing according to the upper and lower limits entered in the specifications table. It can be configured to continue or stop on a radio failure, and print all results or just the failures.

Multiple Test Frequencies

For multichannel radios, up to fifty sets of test frequencies may be specified. If multiple channels are being tested, a program prompt will guide the technician to set the radio to the appropriate channel being tested. Separate RX and TX entries simplify automatic testing of duplex radios.







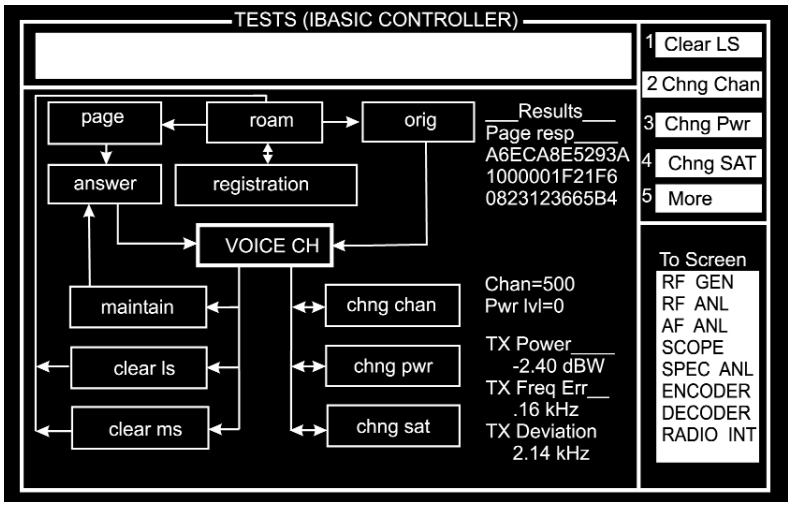
Manual Cellular Phone Troubleshooting
In addition to quick functional and full parametric testing for cellular phones, manual phone troubleshooting is also available with the Agilent 11807A/E software.

Using the on-screen flowchart program, you can troubleshoot a phone as it gains access to a system and while on a voice or a digital traffic channel. Once a voice or traffic channel is assigned, you can test functions of the phone normally performed during use, including handoffs, power-level changes, and releases.

At each stage, RECC or RVC orders are displayed for analysis, along with measurements of power, frequency error, deviation (for analog voice channel), and EVM (for digital traffic channels).

While on an analog voice channel, you can change SAT/DSAT, test DTMF tones, perform a maintenance check of the phone's signaling tone frequency and deviation, and test hook flash numbers.

While on a digital traffic channel, you can perform channel quality measurements, make talkback tests, and measure EVM. This provides you with additional operating information that can aid in troubleshooting a phone.



Using the on-screen flowchart program, you can troubleshoot a phone as it gains access to a system, and while on a voice or a digital traffic channel.

TDMA Dual-Mode Cellular Phones
The 11807E software provides a comprehensive set of tests for TDMA North American dual-mode cellular phones, including new 11807E software for DCCH (IS-136) phones. All 11807E dual-mode packages include complete digital call processing tests such as digital-to-digital handoff, call processing talkback, page, origination, and release. Digital transmitter tests for error vector magnitude, phase and magnitude error, adjacent channel power, and I/Q origin offset have adjustable pass-fail limits and test conditions to simplify DAMPS/DCCH phone testing.

TDMA dual-mode cellular test requires the 8920B Option 800 or 801.*

The Agilent 8920B test set with the 83206A TDMA cellular adapter

* For configuration information, refer to the 8920B/11807E configuration guide, publication number 5968-5919E.

Documented Test Results
A concise, easy-to-read printout accompanies all radio tests if an external printer is added. The test name is displayed along with measured values, test limits, and a pass/fail statement. This not only tells if the radio passed or failed, but how close it was to its limit.

A date and time statement is given on all printouts, and comments may be added to help identify the printout.

Store Test Procedures
All test sequences, frequencies, radio parameters, and specifications can be stored on a memory card or external disk drive. These files can be stored using the model number of the radio or any other text string. Later, when you recall this file, you are ready to test the radio again without any further data entry or changes.

The Agilent 11807A/E software can be modified to quickly develop test files for your radios.

Store Test Results
The 11807A/E also allows you to save your test results for future retrieval. All information that is normally sent to your printer when testing a radio can also be sent to RAM memory cards, external disk drives (DOS or LIF format), and the RS-232 port.

```
Date [MM/DD/YY] 062593     Time [HH.MM) 15.11

Final Test Run of TR 750 Portable
Operator:  L. Davis

================================================================================
Test conditions              Measured value       Lower limit  Upper limit  P/F
================================================================================
_____________Chan=1: RX Freq=935.125 MHz: TX Freq=896.125 MHz_____________

TX frequency error           -0.84 ppm            -1.50         1.50
TX power @ nominal supply     1.5 Watts            1.8          3.0        FAIL
TX mod limiting inst pk+      4.44 kHz                          5.00
TX mod limiting @  .30 kHz    4.14 kHz                          5.00
TX mod limiting @ 3.00 kHz    3.96 kHz                          5.00
TX mod limiting inst pk-      4.22 kHz                          5.00
TX mod limiting @  .30 kHz    3.99 kHz                          5.00
TX mod limiting @ 3.00 kHz    3.77 kHz                          5.00
TX audio distortion           1.2 %                            10.0
TX dev @ 7.5 mVrms            3.2 kHz              2.5          3.5
TX FM hum and noise          -40.7 dB                         -35.0

RX hum & noise unsquelched    39.8 dB             35.0
RX hum & noise squelched      85.2 dB             35.0
RX audio distn 17 dB down      1.9 %                            5.0
RX audio distortion            1.8 %                           10.0
RX usable sensitivity           .13 uV                           .50
RX threshold squelch sens       .10 uV                           .50
RX tight squelch sens           .15 uV                         10.00

Points passed= 16: Points failed= 1

Test time= 149 secs.
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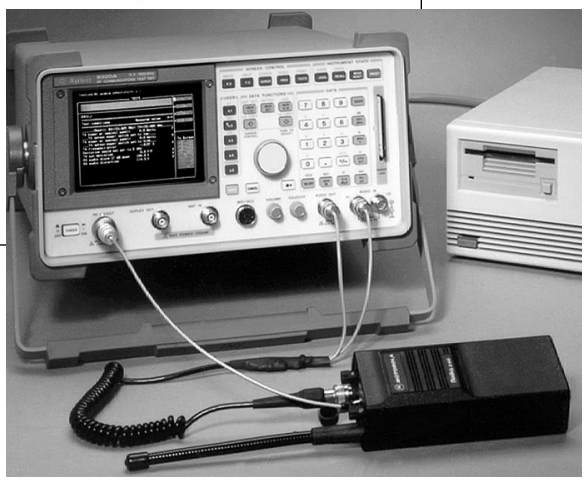


No programming knowledge is necessary to set up and change test files for your radio.

Option Lists

Option 001— North American FM Tests

Radios Supported:

Single- and multiple-channel FM radios
Duplex FM radios
CTCSS squelched radios
CDCSS squelched radios

Testing Modes Supported:

Quick functional
Full parametric

Standard Derived From:

Electronic Industry Association (EIA) FM test specifications
TIA/EIA-603 Land Mobile FM or ΦM communications equipment measurement and performance standard

FM Transceiver Performance Tests

TX and RX standby current drain
TX frequency error
TX output power
TX modulation limiting
TX audio frequency response
TX audio distortion
TX microphone sensitivity
TX FM hum and noise
TX residual AM hum and noise
TX CTCSS/CDCSS deviation, freq/code
TX quick general test

RX hum and noise
RX audio distortion
RX frequency response
RX usable sensitivity
RX audio squelch sensitivity
RX squelch blocking
RX CTCSS/CDCSS opening
RX audio sensitivity
RX variation of sensitivity with frequency
RX quick general test

Option 003— AM Radio Tests

Radios Supported:

Single- and multiple-channel AM radios

Testing Modes Supported:

Quick functional
Full parametric

Standard Derived From:

Electronic Industries Assoc. (EIA) AM radio test specifications [RS-382-A]

AM Transceiver Performance Tests

TX and RX standby current drain
TX frequency error
TX output power
TX audio frequency response
TX audio distortion
TX microphone sensitivity
TX AM hum and noise
TX quick general test

RX hum and noise
RX audio distortion
RX audio frequency response
RX sensitivity (signal-to-noise)
RX sensitivity (SINAD)
RX audio squelch sensitivity
RX automatic gain control
RX quick general test

Option 004— AMPS/EAMPS/NAMPS Cellular Phone Tests

Radios Supported:

AMPS, EAMPS, and NAMPS cellular phones

Testing Modes Supported:

Quick functional
Full parametric
Manual phone troubleshooting
Call processing

Standard Derived From:

Electronic Industries Assoc. (EIA) [TIA/EIA-553 and EIA-IS-19B] cellular radio specifications with modifications for narrow band systems (NAMPS) [TIA/EIA/IS-89]

AMPS/EAMPS/NAMPS Cellular Phone Performance Tests

CP call processing registration
CP call processing page
CP call processing release
CP call processing origination
CP call processing hook flash
CP flow chart (manual phone test)

TX frequency error
TX RF power output
TX modulation deviation limiting
TX audio frequency response
TX audio distortion
TX signaling tone/DST
TX FM hum and noise
TX SAT/DSAT
TX RVC data deviation
TX compressor response
TX current drain
TX DTMF frequency error
TX switch channels
TX quick general test

RX expander response
RX audio frequency response
RX audio distortion
RX hum and noise
RX SINAD
RX FVC order message error rate
RX MRI
RX quick general test

TX/RX quick functional test (no audio)

Option Lists, continued

Option 005—
TACS/ETACS Cellular Phone Tests

Radios Supported:

TACS and ETACS cellular phones

Testing Modes Supported:

Quick functional
Full parametric
Manual phone troubleshooting
Call processing

Standard Derived From:

Total Access Communication System (TACS)

TACS/ETACS Cellular Phone Performance Tests

CP call processing registration
CP call processing page
CP call processing release
CP call processing origination
CP call processing hook flash
CP TACS-2 page and release
CP flow chart (manual phone test)

TX frequency error
TX carrier power
TX peak frequency deviation
TX audio frequency response
TX audio distortion
TX signaling tone
TX FM hum and noise
TX SAT frequency error and deviation
TX wideband data deviation
TX compressor response
TX current drain
TX DTMF frequency error
TX switch channels
TX quick general test

RX expander response
RX audio frequency response
RX audio distortion
RX hum and noise
RX SINAD
RX FVC order message error rate
RX quick general test

TX/RX quick functional test (no audio)

Option 011—
EDACS Trunked Mobile Radio Tests

Radios Supported:

Simplex and duplex FM radios, both conventional (carrier squelch, CTCSS, and CDCSS) and those using the EDACS trunking protocol

Testing Modes Supported:

Manual: conventional or trunked
Automated: conventional and/or trunked single- and multiple-channel testing

Standard Derived From:

Electronic Industry Association (EIA) FM test specifications
TIA/EIA-603 as modified to support the Ericsson GE Enhanced Digital Access Communications System (EDACS) protocol

EDACS Trunked Mobile Radio Performance Tests

TX and RX standby current drain
TX frequency error
TX output power
TX modulation limiting
TX audio frequency response
TX audio distortion
TX microphone sensitivity
TX FM hum and noise
TX residual AM hum and noise
TX signaling deviation and freq/code
TX quick test
TX transient frequency behavior

RX hum and noise
RX audio distortion
RX frequency response
RX usable sensitivity
RX conv. audio squelch sensitivity
RX conv. squelch blocking
RX squelch opening with signaling
RX audio sensitivity
RX conv. signal displacement bandwidth
RX quick test

RT manual test

Option 014 and Option 024 (Agilent 11807E only)— AMPS/NAMPS/DAMPS/DCCH Mobile Test

800-MHz Band Testing with Option 014
800- and 1900-MHz Band Testing with Option 024

Radios Supported:

AMPS/EAMPS/NAMPS/North American TDMA dual-mode (TIA/EIA-628) and tri-mode DCCH (IS-136) cellular phones

Testing Modes Supported:

Quick functional test
Full parametric
Call processing
Manual phone troubleshooting

Standards Derived From:

Electronic Industries Association (EIA) [TIA/EIA-553 and EIA-IS-19B] cellular radio specifications with modifications for narrow band systems (NAMPS) [TIA/EIA/IS-89]

TIA/EIA/IS-137-A 800-MHz TDMA cellular-radio interface minimum performance standards for mobile stations

TIA/EIA-628 recommended minimum performance standards of 800-MHz dual-mode mobile stations

AMPS/NAMPS/DAMPS/DCCH Dual-Mode Cellular Performance Tests

CP registration on analog control channel
CP registration on digital control channel
CP page:
- Analog control channel to analog voice channel
- Analog control channel to digital traffic channel
- Digital control channel to analog voice channel
- Digital control channel to digital traffic channel

CP origination:
- Analog control channel to analog voice channel
- Analog control channel to digital traffic channel
- Digital control channel to analog voice channel
- Digital control channel to digital traffic channel

CP Release to analog control channel
CP Release to digital control channel
CP call processing handoffs including:
- Digital-to-digital (D-D)
- Digital-to-analog (D-A)
- Analog-to-digital (A-D)
- Analog-to-analog (A-A)
- Analog-to-narrow analog (A-NA)
- Narrow analog-to-analog (NA-A)
- Band handoffs 800 to 1900 MHz with Opt. 024 only

CP hook flash

TXA audio distortion
TXA audio frequency response
TXA compressor response
TXA current drain
TXA digital signaling tone (DST) deviation and code
TXA DTMF key pad and DTMF frequency error
TXA DSAT deviation, closure, and phase jitter
TXA FM hum and noise
TXA frequency error
TXA modulation deviation limiting
TXA RF power output
TXA RF power output vs. channel (plotted)
TXA signaling tone frequency and deviation
TXA SAT frequency and deviation
TXA wideband data deviation

RXA audio distortion
RXA audio frequency response
RXA expander
RXA FVC order message error rate
RXA hum and noise
RXA mobile reported interference (MRI)
RXA RF sensitivity (SINAD)
RXA RF sensitivity vs. channel (plotted)

TXD adjacent channel power
TXD modulation accuracy including:
- Error vector magnitude (EVM)
- Peak error vector magnitude (EVM)
- Phase error
- Magnitude error
- Burst amplitude droop
- I/Q origin offset
- Carrier frequency error

TXD modulation accuracy (10 burst), including:
- Error vector magnitude (EVM)
- Peak error vector magnitude (EVM)
- Phase error
- Magnitude error
- Burst amplitude droop
- I/Q origin offset
- Carrier frequency error

TXD RF power output
TXD RF power output vs channel (plotted)
TXD time alignment

RXD receiver sensitivity (channel quality BER, RSSI)
RXD receiver sensitivity (loopback), includes:
- BER

MISC battery life test, transmit
MISC battery life test, standby
MISC digital talkback
MISC TX qualitative audio
MISC RX qualitative audio

Option 100—System Support Tests

The Agilent11807A/E system support tests provide technicians with automated test capability for commonly performed tasks on communications systems. System support tests include cable fault location, intermodulation products calculation, frequency scanning, and field strength measurement.

Cable Fault Location

The cable fault location program contains two tests: a test setup diagram and a cable fault locator that automatically detects cable faults or breaks. The results are shown in a graphical form of relative mismatch versus distance, facilitating quick identification of a fault. Numerical results can be displayed in meters or feet. More than 100 different cable types can be selected, or you can enter the velocity of propagation for your particular cable directly. Cable fault location measurements can typically be made up to 500 feet on low loss cables and up to 300 feet on higher loss cables. Resolution of the fault location is 0.4 feet for cable lengths up to 50 feet; it then linearly increases to 4 feet for a 500 foot cable.

An external power divider and 50-ohm load are required to make this measurement.

Intermodulation Products Calculation

This program (calculate intermods) automatically calculates and displays intermodulation products to the fifth order. Products that are at the same frequency as the receive frequency are identified. The program will accept up to 20 transmitter frequencies and 1 receive frequency for the calculation. This program can be used to help determine the cause of unwanted interference at an antenna site. This allows you to provide the customers with quality, reliable communications.

Frequency Scanner

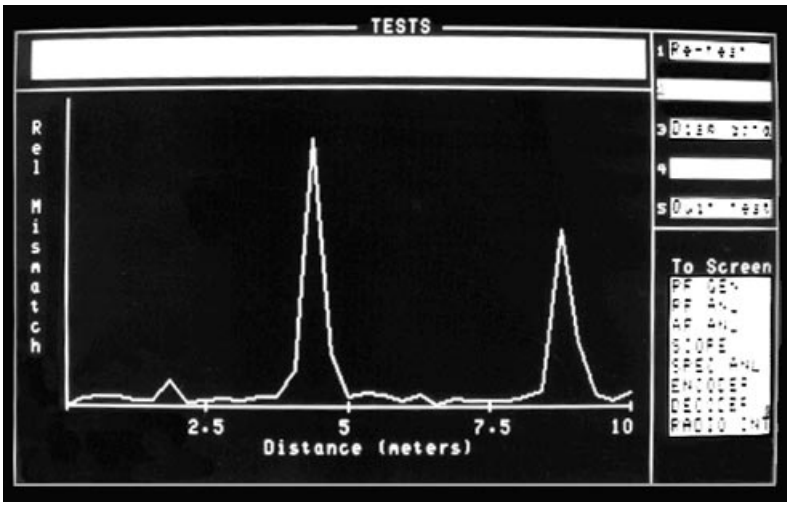
With the frequency scanning program (scanner), the 8920 test set automatically scans up to 100 frequencies. When a signal is found, it will display the frequency, and the recovered audio can be monitored on the speaker. Entered frequencies can be labeled with a text name, which is also displayed.

Field Strength Measurement

With this program, the 8920 will make field strength measurements for a specified measurement plan. It contains two tests: measure test plan and print stored measured data. The plan may contain up to 22 frequencies to be measured at up to 22 different locations. Results are displayed in minimum peak and average power measured for each frequency at a given location. This can be used to determine coverage of antenna sites so that you can improve the quality of service to your customers.

Automated Save/Recall

Sometimes it is necessary to save several files from the test set to a RAM card to preserve data or setups external to the instrument. Depending on the number of files, manually saving and recalling one file at a time back and forth between the RAM card and the test set can be a very time consuming and tedious process. The Save/Recall feature will automatically transfer data, allowing the user a method of easily and quickly downloading saved files to a RAM card.



Note: Options are priced individually.

Related Literature	Pub. Number
8920A Data Sheet	5968-5385E
8920A Product Overview	5968-5386E
8920A Price List	5968-5387EUS
8920B Brochure	5965-4832E
8920B Data Sheet	5965-1573E
8920B/11807E Configuration Guide	5968-5919E
8920B/11807E Price List	5968-5920EUS
Power Measurements Product Note	5966-2557E

For more product information, visit our Web site at:
www.agilent.com/find/8920support/

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Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise
"Our Promise" means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage
"Your Advantage" means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

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