

# HP 8920B RF Communications Test Set

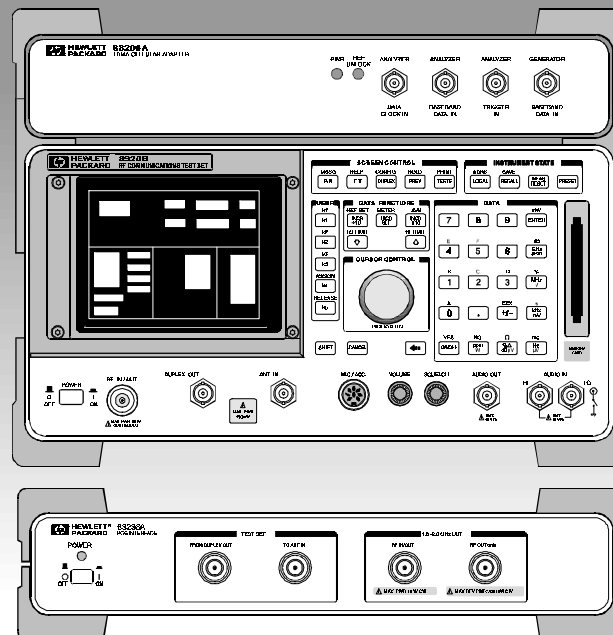
## Technical Specifications

### NEW Test Features

- New, intuitive call processing and on-call parametric test interface.
- High-level HP-IB commands simplify call processing programmability.
- DCCH (IS-136) phone test with new HP 83206A TDMA cellular adapter.
- More accurate digital power measurements, with true-average TDMA power measurements and 10 W to 50  $\mu$ W power measurement range.
- HP VEE support with new HP 8920B drivers.
- PCS (1850 to 1990 MHz) phone test upgrade path with the new HP 83236A PCS interface.

*Improve throughput and quality*

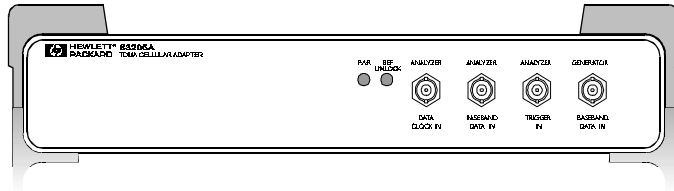
The HP 8920B is a full-function RF test set with accuracy, speed, and flexibility for testing land mobile radios, cellular telephones, and other communications systems while improving throughput and quality in manufacturing.



HP 8920B with  
HP 83206A  
TDMA Cellular  
Adapter

HP 83236A  
PCS Interface

**HP 83206A\*** (800 to 900 MHz)

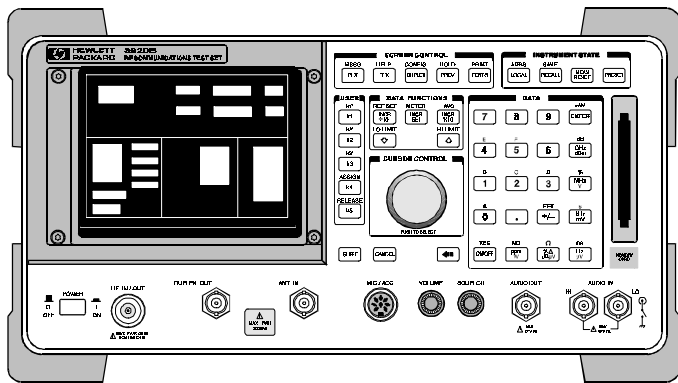


\* Supercedes the HP 83201B TDMA cellular adapter for DAMPS (IS-54) test, adding DCCH (IS-136) measurement capability.

**TDMA Cellular Adapter for DAMPS (IS-54) and DCCH (IS-136) Test**

- $\pi/4$  DQPSK signal generator
- $\pi/4$  DQPSK modulation analyzer
- Data source
- BER analyzer

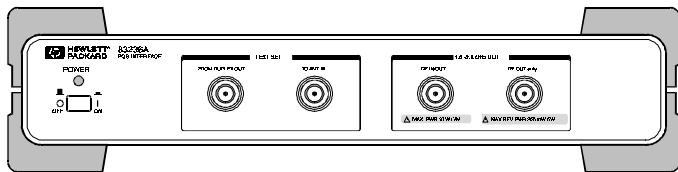
**HP 8920B** (400 kHz to 1GHz)



**RF Communications Test Set**

- RF/AF signal generators
- AM/FM modulation analyzer
- RF/AF power meter
- Spectrum analyzer
- Tracking generator
- Adjacent channel power meter
- Oscilloscope
- IBASIC controller
- Signaling encoder/decoder
- Function generator
- AC/DC voltmeter
- SINAD/SNR meters
- DC current meter
- High stability reference
- IEEE 488.2/RS-232 interface
- Centronics port

**HP 83236A** (1850 to 1990 MHz)



**PCS Interface**

- Frequency translator for PCS-band measurements
- For more information, refer to HP 83236A literature, part number 5964-9655E.

- Accuracy as good as stand alone instruments
- Test speed that lowers your cost per test
- Flexibility to meet more of your testing needs
- Front-panel upgrades and built-in-test to simplify upgrades and maintenance

- For additional information, refer to the following:**
- Brochure: literature number ..... 5965-1571E
  - Configuration Guide: literature number .... 5965-1572E
  - Price List: literature number ..... 5965-1574EUS

# HP 8920B Specifications

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Specifications describe the instrument's warranted performance and are valid over the entire operating/environmental range unless otherwise noted.

*Supplemental Characteristics are intended to provide additional information useful in applying the instrument by giving typical, but non-warranted performance parameters. These characteristics are shown in italics or labeled as "typical", "usable to", or "nominal".*

## Signal Generator Specifications

### RF Frequency

**Range:** 250 kHz to 1 GHz

**Accuracy and Stability:** Same as reference oscillator  $\pm 0.015$  Hz

### Reference Oscillator Specifications

#### TCXO (HP 8920B Standard)

**Temperature:** 1 ppm (0 to  $+55^{\circ}\text{C}$ )

**Aging:**  $< 2$  ppm/year

**Warm-up Time:**  $< 30$ s to be within  $\pm 2$  ppm of final frequency. For higher stability reference, see Opt. 001.

#### Supplemental Characteristics

**Switching Speed:**  $< 150$  ms to be within 100 Hz of carrier frequency.

**Resolution:** 1 Hz

### Output

#### RF In/Out Connector

**Level Accuracy:**  $\pm 1.2$  dB (level  $\geq -127$  dBm)  
If RF analyzer is also connected add  $\pm 0.1$  dB  
*Typically  $\pm 1.0$  dB for all levels.*

#### Standard:

**Level Range:**  $-137$  to  $-19$  dBm into  $50\ \Omega$

**Reverse Power:** 60 watts continuous,  
100 watts for 10 seconds/minute.

#### Option 006 (cellular power option):

**Level Range:**  $-137$  to  $-21$  dBm into  $50\ \Omega$

**Reverse Power:** 9.5 watts continuous,  
15.8 watts for 10 seconds per minute.

#### Option 007 (low power option):

**Level Range:**  $-137$  to  $-5$  dBm into  $50\ \Omega$

**Reverse Power:** 2.4 watts continuous,  
4.0 watts for 10 seconds/minute.

#### Option H08 (high power option):

**Level Range:**  $-137$  to  $-21$  dBm into  $50\ \Omega$

**Reverse Power:** 100 watts continuous,  
125 watts for 10 seconds per minute.

#### Duplex Out Connector

**Level Accuracy:**  $\pm 1$  dB

**Level Range:**  $-127$  to  $+7$  dBm into  $50\ \Omega$

**Reverse Power:** 200 mW max.

#### SWR

**RF In/Out:**  $< 1.5:1$

**Duplex Out:**  $< 2.0:1$  (level  $< -4$  dBm)

#### Supplemental Characteristics

**Resolution:** 0.1 dB

### Spectral Purity

**Spurious Signals** (for  $\leq 1$  dBm output level at Duplex Out or  $\leq -25$  dBm output level at RF In/Out).

**Harmonics:**  $< -30$  dBc

**Non-Harmonic Spurious:**  $< -60$  dBc  
(at  $> 5$  kHz from carrier)

#### Residual FM (rms, CCITT):

$250\ \text{kHz} \leq f_c < 249\ \text{MHz}$   $< 7$  Hz

$249\ \text{MHz} \leq f_c < 501\ \text{MHz}$   $< 4$  Hz

$501\ \text{MHz} \leq f_c \leq 1000\ \text{MHz}$   $< 7$  Hz

#### Supplemental Characteristics

#### SSB Phase Noise:

(for  $> 20$  kHz offsets at 1 GHz)  $< -116$  dB/Hz

### FM

#### FM Deviation Maximum (For rates $> 25$ Hz)

100 kHz: for  $f_c$  from 0.25 to  $< 249$  MHz

50 kHz: for  $f_c$  from 249 to  $< 501$  MHz

100 kHz: for  $f_c$  from 501 to 1000 MHz

(FM not specified for ( $f_c$  minus FM dev.)  $< 250$  kHz)

#### FM Rate (1 kHz reference)

**Internal:** DC to 25 kHz (1 dB BW)

#### External:

AC Coupled: 20 Hz to 75 kHz (*typical 3 dB BW*)

DC Coupled: DC to 75 kHz (*typical 3 dB BW*)

#### FM Accuracy (1 kHz rate)

$\leq 10$  kHz dev:  $\pm 3.5\%$  of setting  $\pm 50$  Hz

$> 10$  kHz dev:  $\pm 3.5\%$  of setting  $\pm 500$  Hz

#### FM Distortion

(THD + Noise, in a 0.3 to 3 kHz BW):

$< 0.5\%$  at  $> 4$  kHz deviation and 1 kHz rate.

#### Center Frequency Accuracy in DC FM Mode

(External source impedance  $< 1\ \text{k}\Omega$ ):  $\pm 500$  Hz (after DC FM zero), *typically  $\pm 50$  Hz.*

#### Supplemental Characteristics

**Ext. Mod. Input Impedance:**  $600\ \Omega$  nominal

**Resolution:** 50 Hz for  $< 10$  kHz deviation  
500 Hz for  $\geq 10$  kHz deviation.

## AM

**Frequency Range:** 1.5 to 1000 MHz (*usable to 250 kHz*)

**AM Depth:** 0 to 90% (*usable to 99%*) for Duplex Out level  $\leq +1$  dBm or RF In/Out level  $\leq -25$  dBm; 0 to 70% (*usable to 90%*) with HP 8920B Option 051, rear panel connectors for TDMA testing.

**AM Rate:** 20 Hz to 25 kHz (3 dB BW)

**AM Accuracy:** (1 kHz rate)

$\leq 10\%$  AM:  $\pm 5\%$  of setting,  $\pm 1.0\%$  AM

$> 10\%$  AM:  $\pm 5\%$  of setting,  $\pm 1.5\%$  AM

**AM Distortion** (THD+Noise 0.3 to 3 kHz BW):

$< 2\%$  at 1 kHz rate,  $< 30\%$  AM

$< 3\%$  at 1 kHz rate,  $\leq 90\%$  AM

### Supplemental Characteristics

**Ext. Mod. Input Impedance:** 600  $\Omega$  nominal

**Residual AM:**  $< 0.1\%$  in a 50 Hz to 15 kHz BW

**Resolution:** 0.05% AM for 0 to 10% AM,

0.5% AM for 10 to 100% AM

## TDMA Signal Generator Specifications

HP 8920B Opt. 001, 004, 051, 800 (HP 8920B + HP 83206A)

HP 8920B Opt. 001, 004, 051, 500 (HP 8920B + HP 83201B)

**Frequency Range:** 824 MHz to 894 MHz

### Output Level Range:

RF In/Out:  $-22$  dBm to  $-127$  dBm

Duplex Out:  $+4$  dBm to  $-127$  dBm

**Residual Error Vector Magnitude:**  $< 3.0\%$

**Residual Phase Error:**  $< 2.6^\circ$

**Residual Magnitude Error:**  $< 2.6\%$

**IQ Origin Offset:**  $< -30$  dBc within  $15^\circ\text{C}$  of last calibration

**Frequency Error:**  $\pm 4$  Hz plus reference error

## Audio Source Specifications

(Applicable to both internal sources)

### Frequency

**Range:** dc to 25 kHz

**Accuracy:** 0.025% of setting

### Supplemental Characteristics

**Resolution:** 0.1 Hz

## Output Level

**Range:** 0.1 mV to 4 Vrms

**Maximum Output Current:** 20 mA peak

**Output Impedance:**  $< 1 \Omega$  (1 kHz)

**Accuracy:**  $\pm 2\%$  of setting plus resolution

**Residual Distortion:** 0.125%

(THD plus noise, for amplitudes  $> 200$  mVrms), for tones 20 Hz to 25 kHz measured in an 80 kHz BW.

### Supplemental Characteristics

**Resolution:** Level  $\leq 0.01$  V:  $\pm 50 \mu\text{V}$

Level  $\leq 0.1$  V:  $\pm 0.5$  mV

Level  $\leq 1$  V:  $\pm 5$  mV

Level  $> 1$  V:  $\pm 50$  mV

**Offset in DC Coupled Mode:**  $< 50$  mV

## RF Analyzer Specifications

### RF Frequency Measurements

**Measurement Range:** 400 kHz to 1 GHz

**Level Range:**

**RF In/Out:**

**Standard:** 1 mW to 60 W continuous

100 W for 10 seconds per minute

**Option 006** (cellular power option): 50  $\mu\text{W}$  to 10 W continuous, 15 W for 10 seconds per minute

**Option 007** (low power option): 40  $\mu\text{W}$  to 2.4 W continuous, 4 W for 10 seconds per minute

**Option H08** (high power option): 1.6 mW to 100 W continuous, 125 W for 10 seconds per minute

**ANT IN:**  $-36$  dBm to  $+20$  dBm in auto-tune mode

**Accuracy:**  $\pm 1$  Hz plus timebase accuracy

### Supplemental Characteristics

**Frequency Resolution:** 1 Hz

### RF Power Measurements

**Frequency Range:** 400 kHz to 1 GHz

**SWR:** RF In/Out port  $< 1.5:1$

**RF In/Out Measurement Range:**

To achieve the specified accuracy when measuring power at the RF in/out port, the internal signal generator level must be 60 dB below the measured power or less than  $-20$  dBm at the duplex port.

**Standard:** 1 mW to 60 W continuous

or to 100 W for 10 seconds per minute

**Accuracy:**  $\pm 5\%$  of reading  $\pm 0.01$  mW  $\pm 1$  count for temperature range of  $25 \pm 10^\circ\text{C}$ . Accuracy:  $\pm 10\%$  of reading for operating temperature range.

**Option 006** (cellular power option): 50  $\mu$ W to 10 W continuous, 15 W for 10 seconds per minute.

**Frequency Range:** 30 MHz to 1 GHz

**Accuracy:**  $\pm 5\%$  of reading  $\pm 0.5 \mu$ W  $\pm 1$  count for temperature range of  $25 \pm 10^\circ$  C. Accuracy:  $\pm 10\%$  of reading for operating temperature range.

**Option 007** (low power option): 40  $\mu$ W to 2.4 W continuous, 4.0 W for 10 seconds per minute.

**Accuracy:**  $\pm 5\%$  of reading  $\pm 400$  nW  $\pm 1$  count for temperature range of  $25 \pm 10^\circ$  C. Accuracy:  $\pm 10\%$  of reading for operating temperature range.

**Option H08** (high power option): 1.6 mW to 100 W continuous, 125 W for 10 seconds per minute.

**Accuracy:**  $\pm 5\%$  of reading  $\pm 0.01$  mW  $\pm 1$  count for temperature range of  $25 \pm 10^\circ$  C. Accuracy:  $\pm 10\%$  of reading for operating temperature range.

### Supplemental Characteristics

**Resolution:**  $P > 10$ W: 10 mW,  $P < 10$ W: 1 mW,

$P < 100$  mW: 0.1 mW,  $P < 10$  mW: 0.01 mW

### FM Measurement

**Frequency Range:** 5 MHz to 1 GHz (Usable to 400 kHz)

**Deviation:** 20 Hz to 75 kHz

**Sensitivity:** 2  $\mu$ V (15 kHz IF BW, high sensitivity mode, 0.3 to 3 kHz BW) typically:  $< 1 \mu$ V (12 SINAD,  $f_c > 10$  MHz).

**Accuracy:**  $\pm 4\%$  of reading plus residual FM and noise contribution (20 Hz to 25 kHz rates, deviation  $\leq 25$  kHz).

**Bandwidth (3 dB):** 2 Hz to 70 kHz (DC FM measurements also available).

**THD+Noise:**  $< 1\%$  rms (for deviation  $\geq 5$  kHz and at a rate of 1 kHz in a 0.3 to 3 kHz BW)

**Input Level Range for Specified Accuracy:**

**Standard:**

-18 to +50 dBm at RF In/Out (0.016 mW to 100 W)

-50 to +14 dBm at Ant In

**Option 006** (cellular power option): -26 to +42 dBm at RF In/Out (2.5  $\mu$ W to 15.8 W)

**Option 007** (low power option):

-32 to +36 dBm at RF In/Out (0.63  $\mu$ W to 4.0 W)

**Option H08** (high power option): -16 to +50 dBm at RF In/Out (0.025 mW to 100 W)

**Residual FM and Noise:**  $< 7$  Hz (0.3 to 3 kHz, rms)

### Supplemental Characteristics

**Resolution:** 1 Hz,  $f < 10$  kHz; 10 Hz,  $f \geq 10$  kHz

### AM Measurement

**Frequency Range:** 10 MHz to 1 GHz (usable to 400 kHz)

**Depth:** 0 to 95%

**Accuracy:**  $\pm 5\%$  of reading  $\pm 1.5\%$  AM (50 Hz to 10 kHz rates, modulation  $\leq 80\%$ )

**THD+Noise:**  $< 2\%$  rms for modulation  $\leq 80\%$  AM (at 1 kHz rate in a 0.3 to 3 kHz BW)

**Input Level for Specified Accuracy** (levels in PEP):

**Standard:**

-18 to +50 dBm at RF In/Out (0.016 mW to 100 W)

-50 to +14 dBm at Ant In

**Option 006** (cellular power option): -26 to +42 dBm at RF In/Out (2.5  $\mu$ W to 15.8 W)

**Option 007** (low power option):

-32 to +36 dBm at RF In/Out (0.63  $\mu$ W to 4.0 W)

**Option H08** (high power option): -16 to +50 dBm at RF In/Out (0.025 mW to 100 W)

**Residual AM:**  $< 0.2\%$  in a 0.3 to 3 kHz BW

### Supplemental Characteristics

**Resolution:** 0.1%

### SSB Measurement

**Frequency Range:** 400 kHz to 1 GHz

**Bandwidth (3 dB):** 20 Hz to 70 kHz

**Distortion and Noise:**  $< 3\%$  (at 1 kHz rate in a 0.3 to 3 kHz BW)

### TDMA Analyzer Specifications

HP 8920B Opt. 001, 004, 051, 800 (HP 8920B + HP 83206A)

HP 8920B Opt. 001, 004, 051, 500 (HP 8920B + HP 83201B)

**Frequency Range:** 824 MHz to 894 MHz

**Input Level Range:**

**RF In/Out:** 1 mW to 60 W (0 to +47.8 dBm)

**Antenna In:** -36 to +16 dBm

**Input Frequency Setting Error:** 1 kHz

**RX DSP Level Setting Range:** -23 to 0 dB full scale

**Residual Error Vector Magnitude:**  $< 1.3\%$

**Error Vector Magnitude Measurement Accuracy:**  $\pm 0.4\%$  plus 2% of reading

**Residual Phase Error:**  $< 1.0^\circ$

**Residual Magnitude Error:**  $< 0.9\%$

**I/Q Origin Offset Accuracy:**  $\pm 0.5$  dB for values to -40 dBc

**Frequency Error Accuracy:**  $\pm 2.5$  Hz plus reference accuracy

## AF Analyzer Specifications

### Frequency Measurement

**Measurement Range:** 20 Hz to 400 kHz

**Accuracy:**  $\pm 0.02\%$  plus resolution plus reference accuracy

**External Input:** 20 mV to 30 Vrms

#### **Supplemental Characteristics**

**Resolution:** 0.01 Hz,  $f < 10$  kHz; 0.1 Hz,  $f < 100$  kHz; and 1 Hz for  $f \geq 100$  kHz

### AC Voltage Measurement

**Measurement Range:** 0 to 30 Vrms

**Accuracy:**  $\pm 3\%$  of reading (20 Hz to 15 kHz, inputs  $\geq 1$  mV)

**Residual Noise:** 150  $\mu$ V (15 kHz BW)

#### **Supplemental Characteristics**

**3 dB Bandwidth:** Typically 2 Hz to 100 kHz

**Nominal Input Impedance:** Switchable between 1 M $\Omega$  in parallel with 95 pF or 600  $\Omega$  floating

**Resolution:** 4 digits for inputs  $\geq 100$  mV; 3 digits for inputs  $< 100$  mV

### DC Voltage Measurement

**Voltage Range:** 100 mV to 42 V

**Accuracy:**  $\pm 1.0\%$  of reading plus DC offset

**DC Offset:**  $\pm 45$  mV

#### **Supplemental Characteristics**

**Resolution:** 1 mV

### Distortion Measurement

**Frequency Range:** 300 Hz to 10 kHz  $\pm 5\%$

**Input Level Range:** 30 mV to 30 Vrms

**Display Range:** 0.1% to 100%

**Accuracy:**  $\pm 1$  dB (0.5 to 100% distortion) for tones from 300 to 1500 Hz measured with the 15 kHz LPF.

$\pm 1.5$  dB (1.5 to 100% distortion) for tones from 300 Hz to 10 kHz measured with  $> 99$  kHz LPF).

**Residual THD+Noise:**  $-60$  dB or 150  $\mu$ V, whichever is greater, for tones from 300 to 1500 Hz measured with the 15 kHz LPF.

$-57$  dB or 450  $\mu$ V, whichever is greater, for tones from 300 Hz to 10 kHz measured with  $> 99$  kHz LPF.

#### **Supplemental Characteristics**

**Resolution:** 0.1% Distortion

## SINAD Measurement

**Frequency Range:** 300 Hz to 10 kHz  $\pm 5\%$

**Input Level Range:** 30 mV to 30 Vrms

**Display Range:** 0 to 60 dB

**Accuracy:**  $\pm 1$  dB (0 to 46 dB SINAD) for tones from 300 to 1500 Hz measured with the 15 kHz LPF.

$\pm 1.5$  dB (0 to 36 dB SINAD) for tones from 300 Hz to 10 kHz measured with  $> 99$  kHz LPF).

**Residual THD+Noise:**  $-60$  dB or 150  $\mu$ V, whichever is greater, for tones from 300 to 1500 Hz measured with the 15 kHz LPF.

$-57$  dB or 450  $\mu$ V, whichever is greater, for tones from 300 Hz to 10 kHz measured with  $> 99$  kHz LPF.

#### **Supplemental Characteristics**

**Resolution:** 0.01 dB

## Audio Filters

**Standard:**  $< 20$  Hz HPF, 50 Hz HPF, 300 Hz HPF, 300 Hz LPF, 3 kHz LPF, 15 kHz LPF,  $> 99$  kHz LPF, 750  $\mu$ sec de-emphasis.

**Optional:** C-Message, CCITT, 400 Hz HPF, 4 kHz BPF, 6 kHz BPF.

## Variable Frequency Notch Filter

**Frequency Range:** 300 Hz to 10 kHz

**Notch Depth:**  $> 60$  dB

**Notch Width:** Typically  $\pm 5\%$

## Audio Detectors

RMS, RMS\*SQRT2, Pk+, Pk-, Pk+hold, Pk-hold, Pk $\pm/2$ , Pk $\pm/2$  hold, Pk $\pm$ max, Pk $\pm$ maxhold

## Oscilloscope Specifications

**Frequency Range:** 2 Hz to 50 kHz (3 dB BW)

**Scale/Division:** 10 mV to 10 V

**Amplitude Accuracy:**  $\pm 1.5\%$  of reading  $\pm 0.1$  div. (20 Hz to 10 kHz)

**Time/Division:** 1  $\mu$ sec to 200 msec

**Trigger Delay Range:** 20  $\mu$ sec to 3.2 seconds

#### **Supplemental Characteristics**

**3 dB Bandwidth:** Typically  $> 100$  kHz

**Internal DC Offset:**  $\leq 0.1$  div. ( $\geq 50$   $\mu$ V/div. sensitivity)

## Standard User Memory, RAM

Approximately 928 Kbytes of RAM are available for non-volatile save/recall of settings. This typically will allow you to save greater than 500 sets of instrument settings; depending on the type of information saved.

## Standard Rear Panel Interfaces

Current Sensing and I/O: HP-IB/RS-232/ Parallel (Centronics)

## DC Current Meter

**Measurement Range:** 0 to 10 A (*usable to 20 A*)

**Accuracy:** The greater of  $\pm 10\%$  of reading after zeroing or 30 mA (levels >100 mA)

## Remote Programming

**HP-IB:** Hewlett-Packard's implementation of IEEE Standard 488.2

**Functions Implemented:** SH1, AH1, T6, L4, SR1, RL1, LE0, TE0, PP0, DC1, DT1, C4, C11, E2

**RS-232:** Two serial ports through RJ-11 connector used for serial data in and out.

**Baud Rates:** 150, 300, 600, 1200, 2400, 4800, 9600, and 19200 Hz

## Memory Card Specifications:

**Card Compatibility:** Single industry standard PCMCIA slot accepts Type I or Type II SRAM and ROM memory cards.

**Storage Capability:** Allows for the storage and retrieval of IBASIC program parameter and results data, input of new calibration data, and long-term storage of Store/Recall information.

**Firmware Upgrades:** Accepts PCMCIA flash memory cards (4 Mbytes) to allow automatic loading of new firmware for the host CPU from the front panel. Upgrade time is about two minutes.

## HP 8920B Options

### Option 001, High Stability Timebase

**OCXO:** (Oven controlled crystal oscillator)

**Temperature:** 0.05 ppm (0 to +55° C)

**Aging:** <0.5 ppm/year (<1 ppm in first year)

**Warm-up Time:** <15 minutes to be within  $\pm 0.1$  ppm of final frequency

#### *Supplemental Characteristics*

#### **Rear Panel BNC connectors:**

**Input Frequency:** 1, 2, 5, and 10 MHz

**Input Level:** >0.15 V<sub>rms</sub>

**Output Frequency:** 10 MHz

**Output Level:** >0.5 V<sub>rms</sub>

## Option 004, Tone/Digital Signalling

**Capability for generating and analyzing the formats listed here:** CDCSS, DTMF, 1-TONE, 2-TONE, 5/6 TONE SEQUENTIAL, RPC1, (POCSAG), EIA, CCITT, CCIR, ZVEI, DZVEI, GOLAY, EEA, NMT-450, NMT-900, LTR, AMPS/EAMPS/NAMPS, TACS/ETACS, JTACS/NTACS, EDACS, MPT 1327, and TDMA dual-mode.

**A general purpose function generator with:** Sine, square, triangle, ramp, dc, Gaussian white noise, uniform white noise.

**Frequency range/ level:** Same as audio source

## Option 006, 10 W to 50 $\mu$ W Power Measurement Range

Option 006 was designed to optimize the measurement range for cellular mobile station test. It increases the dynamic range of the instrument by 5 dB and enables true-average power measurements on TDMA signals using the HP 83206A (HP 8920B Option 800). Option 006 is recommended for IS-136 testing. The RF frequency range for Option 006 power measurement is 30 MHz to 1 GHz.

## Option 007, Low-level RF Power Measurements

Option 007 removes a 14 dB attenuator at the RF In/Out port allowing lower-level, higher sensitivity measurements. This option reduces the maximum continuous input power of the HP 8920B from 60 watts to 2.4 watts.

### Option 010, 400 Hz High Pass Filter

### Option 011, CCITT Weighting Filter

### Option 012, 4 kHz Bandpass Filter

### Option 013, C-Message Weighted Filter

### Option 014, 6 kHz Bandpass Filter

## Option H08, High Level RF Power Measurements to 100 W Continuous

Option H08 tests high power transmitters (up to 100 W continuous, 125 W intermittently with a 10 seconds per minute duty cycle).

## Option 020, Radio Interface Card

The Option 020 for the HP 8920B is a built-in radio interface card for automating module and radio test. It contains 16 parallel data lines, two interrupts, and brings the audio in/out lines and a relay closure out from the MIC/ACC connector on the front panel. These are controlled by the HP 8920B I-BASIC control language.

## Option 031, Delete Handle and Cover

Option 031 deletes the handle and the protective front cover from the instrument.

## Option 051, Rear Panel Connectors for TDMA Measurements for TDMA

### Option 500, 800

This option provides the necessary rear panel connectors to work with the HP 83201B Option 003 TDMA cellular adapter (HP 8920B Option 500) and the HP 83206A TDMA cellular adapter (HP 8920B Option 800).

## Option 102, Spectrum Analyzer with Tracking Generator and ACP

**Frequency Range:** 400 kHz to 1 GHz

**Frequency Span/Resolution Bandwidth:** (coupled)

Span	Bandwidth
<50 kHz	300 Hz
<200 kHz	1 kHz
<1.5 MHz	3 kHz
<18 MHz	30 kHz
≥18 MHz	300 kHz, plus full span capability

**Display:** Log with 1, 2, and 10 dB/div.

**Display Range:** 80 dB

**Reference Level Range:** +50 to -50 dBm

**Residual Responses:** <-70 dBm (no input signal, 0 dB attenuation)

**Image Rejection:** >50 dBm

### Supplemental Characteristics

**Non-harmonic Spurious Responses:** >70 dB down (for input signals ≤-30 dBm)

**Level Accuracy:** ±2.5 dB

**Displayed Average Noise Level:** <-114 dBm for <50 kHz spans

**Log Scale Linearity:** ±2 dB (for input levels ≤-30 dBm and/or 60 dB range)

## Tracking Generator (In Option 102)

**Frequency Range:** 400 kHz to 1 GHz

**Frequency Offset:** Frequency span endpoints ± frequency offset cannot be <400 kHz or ≥1 GHz

**Output Level Range:** Same as signal generator

**Sweep Modes:** Normal and inverted

## Adjacent Channel Power (in Option 102)

**Relative Measurements:**

**Level Range:**

**Antenna In:** -40 dBm to +20 dBm

**RF In/Out:**

**Standard:** 1 mW to 60 W continuous or to 100 W for 10 seconds per minute

**Option 006** (cellular power option): 50 μW to 10 W continuous, 15 W for 10 seconds per minute

**Option 007** (low power option): 40 μW to 2.4 W continuous, 4.0 W for 10 seconds per minute

**Option H08** (high power option): 1.6 mW to 100 W continuous, 125 W for 10 seconds per minute

**Dynamic Range:** *Typical values for channel offsets*

Channel offset	Channel BW	Dynamic range
12.5 kHz	8.5 kHz	-65 dBc
20 kHz	14 kHz	-68 dBc
25 kHz	16 kHz	-68 dBc
30 kHz	16 kHz	-68 dBc
60 kHz	30 kHz	-65 dBc

**Relative Accuracy:** ±2.0 dB



## Absolute Level Measurements:

**Level:** Results of absolute power in watts or dBm are met by adding the ACP ratio from the spectrum analyzer to the carrier power from the input section RF power detector.

## Level Range:

**Antenna In:** N/A

### RF In/Out:

**Standard:** 1 mW to 60 W continuous or to 100 W for 10 seconds per minute.

**Option 006** (cellular power option): 50  $\mu$ W to 10 W continuous, 15 W for 10 seconds per minute.

**Option 007** (low power option): 40  $\mu$ W to 2.4 W continuous, 4.0 W for 10 seconds per minute.

**Option H08** (high power option): 1.6 mW to 100 W continuous, 125 W for 10 seconds per minute.

**Dynamic Range:** *Typical values for channel offsets*

Channel Offset	Channel BW	Dynamic Range
12.5 kHz	8.5 kHz	-65 dBc
20 kHz	14 kHz	-68 dBc
25 kHz	16 kHz	-68 dBc
30 kHz	16 kHz	-68 dBc
60 kHz	30 kHz	-65 dBc

**Absolute Accuracy:** Equals the sum of RF power measurement accuracy found in the RF analyzer section and the ACP relative accuracy of  $\pm 2.0$  dB.

## Option 500, Dual-mode TDMA Cellular Adapter - EIA/TIA IS-54 DAMPS

The HP 8920B Option 500 includes the HP 83201B Option 003 TDMA cellular adapter attached, tested, and calibrated with the HP 8920B communications test set.

## Option 800, Dual-mode TDMA Cellular Adapter - EIA/TIA, IS-54 DAMPS, and IS-136 DCCH

The HP 8920B Option 800 includes the HP 83206A TDMA cellular adapter attached, tested, and calibrated with the HP 8920B communications test set.

## General Specifications

**Dimensions** H x W x D in inches (mm)

**HP 8920B:** 7.5"H x 13"W x 19"D (188x330x456 mm)

**HP 8920B Option 500** (HP 83201B/Opt. 003 attached): 9.8"H x 13"W x 19"D (250x330x456 mm)

**HP 8920B Option 800** (HP 83206A attached): 9.8"H x 13"W x 19"D (250x330x456 mm)

**Weight** (fully optioned)

**HP 8920B:** 37 lbs. net (16.8 kgs.)

Shipping Weight: 61 lbs. net (27.7 kgs.)

**HP 8920B with Option 500** (HP 83201B Option 003 attached): 50 lbs. net (22.7 kgs.)

Shipping Weight: 80 lbs. net (36.3 kgs.)

**HP 8920B Option 800** (HP 83206A attached): 50 lbs. net (22.7 kgs.)

Shipping Weight: 80 lbs. net (36.3 kgs.)

## Power

**HP 8920B:**

AC: 100 V to 240 V  $\pm 10\%$ , 48 to 440 Hz, *nominally 100 watts*

DC: 11 V to 28 V, *nominally 120 watts*

**HP 8920B with Option 500:**

AC: 100 V to 240 V  $\pm 10\%$ , 48 to 440 Hz, *nominally 120 watts*

**HP 8920B Option 800** (HP 83206A attached):

AC: 100 V to 240 V  $\pm 10\%$ , 48 to 440 Hz, *nominally 140 watts*

## General

**CRT Size:** 7 x 10 cm

**Operating Temperature:** 0 to +55° C

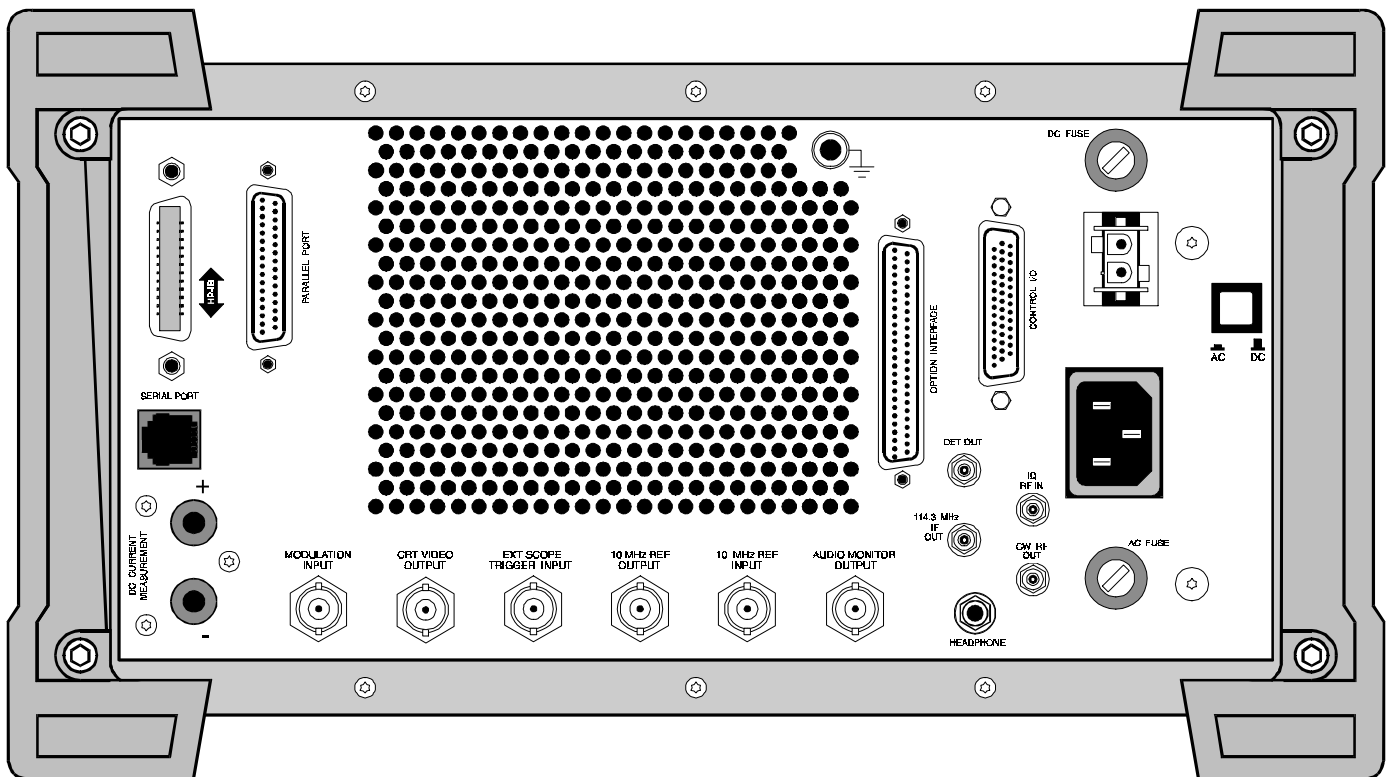
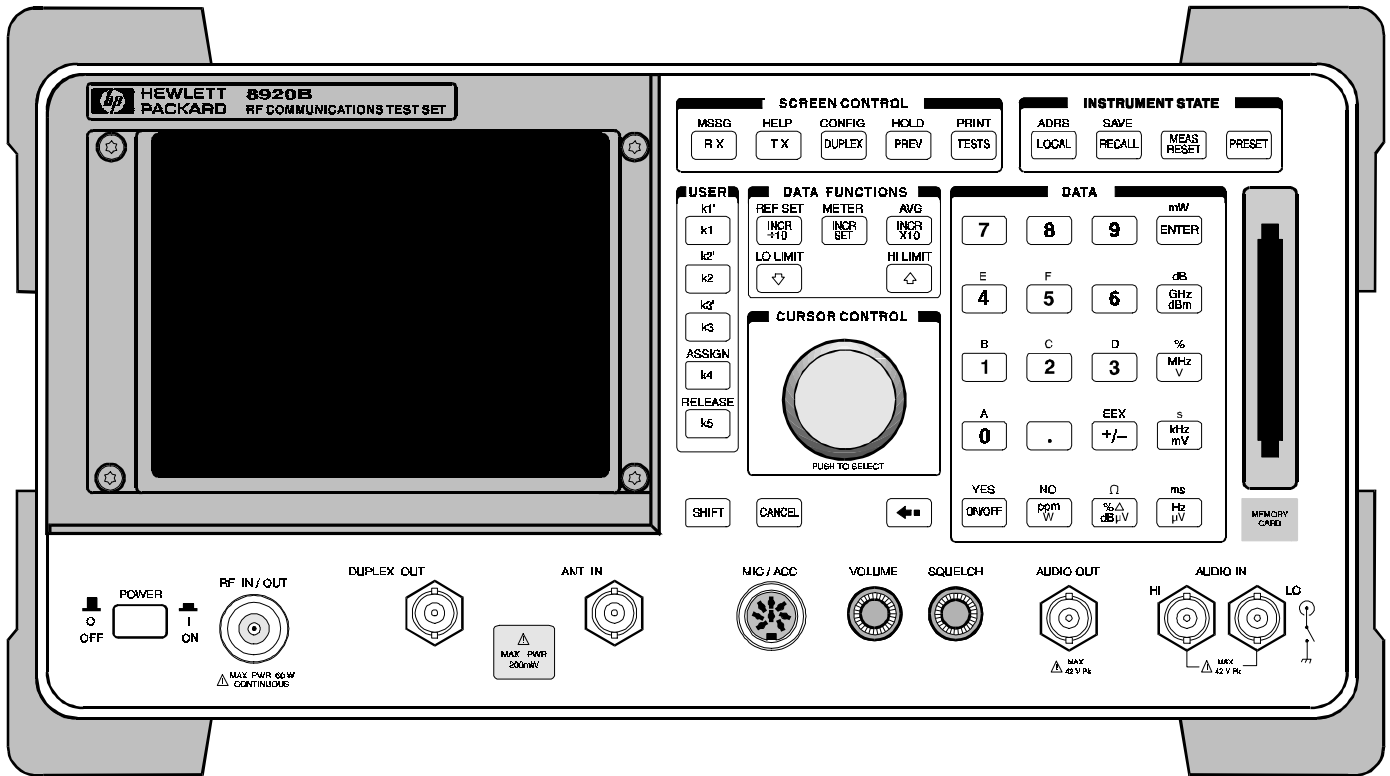
**Storage Temperature:** -55 to +75° C

**Calibration Interval:** Two years

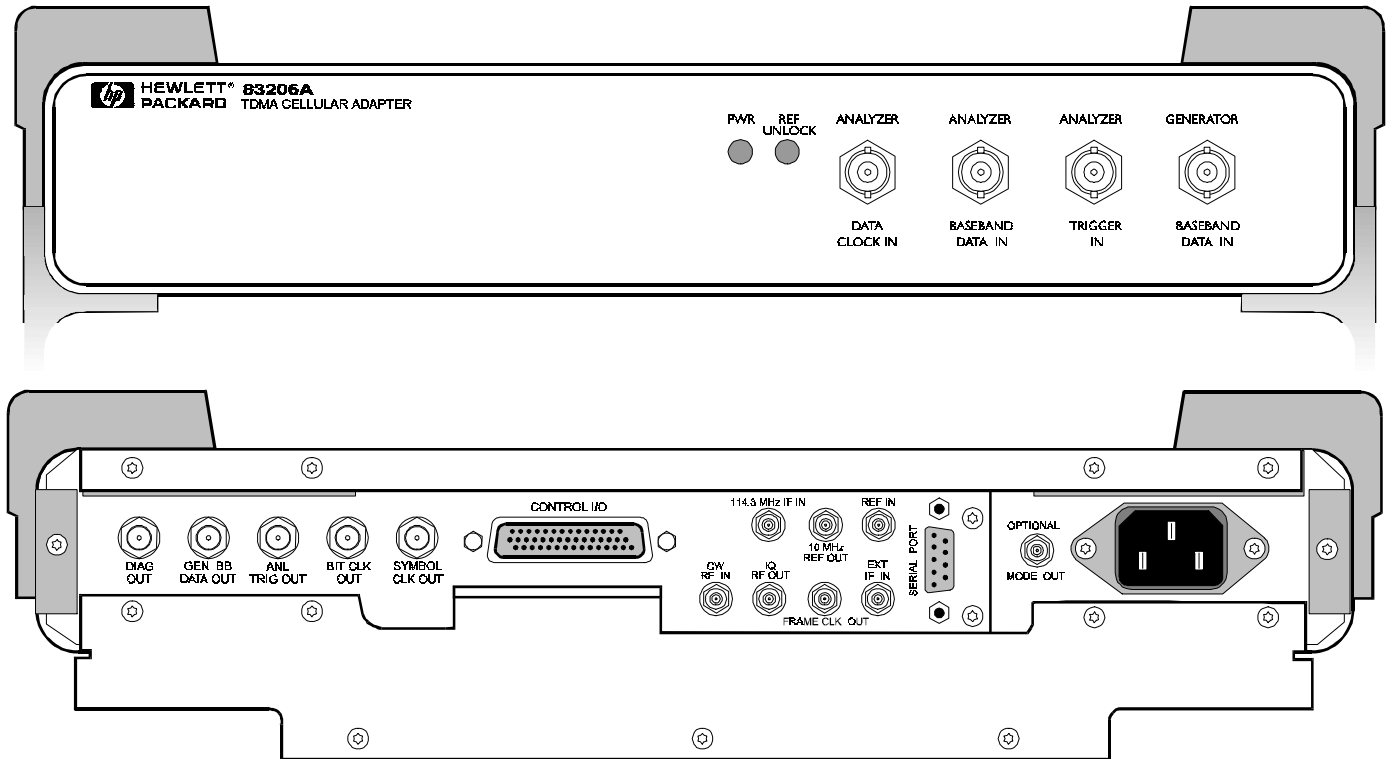
## Supplemental Characteristics

**Leakage:** *At signal generator output frequency and level  $< -40$  dBm, typical HP 8920B leakage is  $< 1.0$   $\mu$ V (2.0  $\mu$ V for HP 8920B Option 500 or 800) induced in a resonant dipole antenna one inch from any surface except the rear panel. Spurious leakage levels are typically  $< 1$   $\mu$ V in a resonant dipole antenna.*

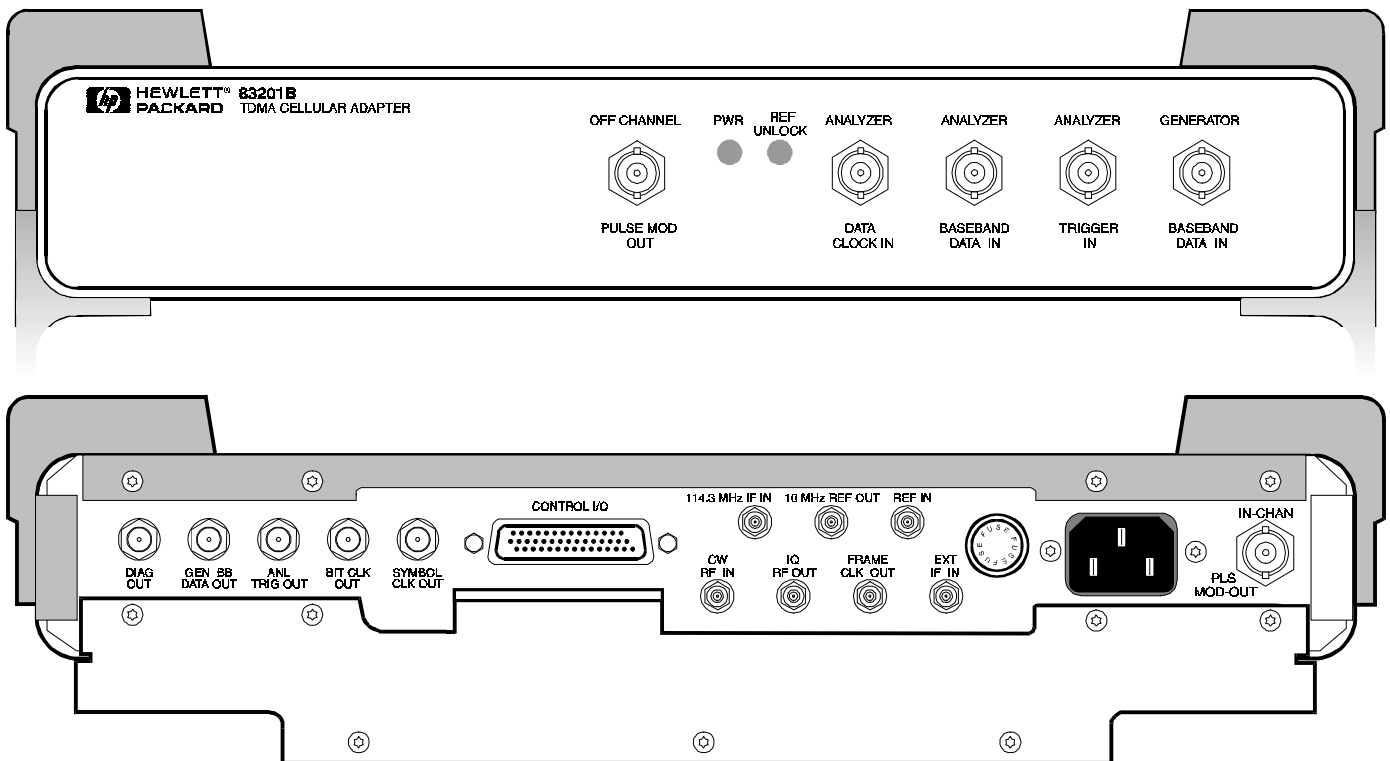
# HP 8920B front and rear panels



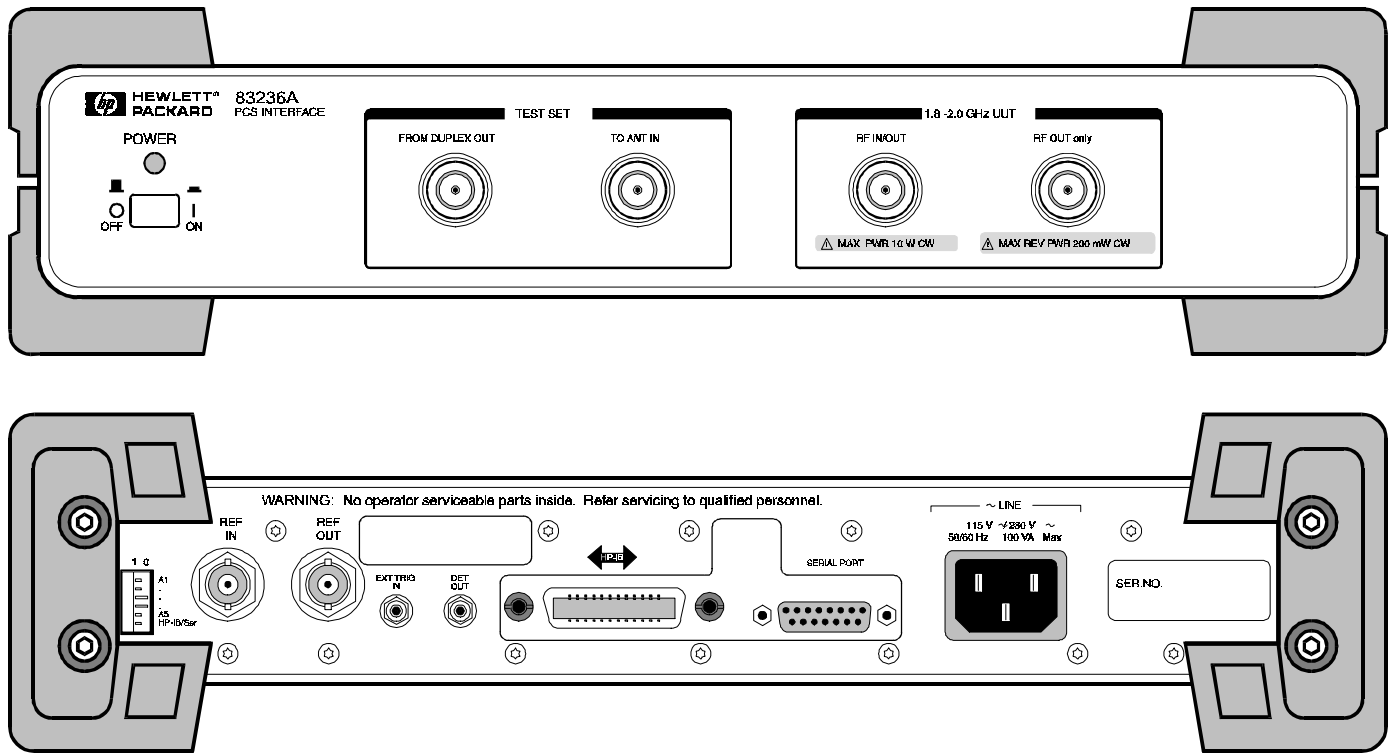
## HP 83206A front and rear panels



## HP 83201B front and rear panels



## HP 83236A front and rear panels



**For additional information, refer to the following literature:**

- Brochure: literature number ..... 5965-1571E
- Configuration Guide: literature number .... 5965-1572E
- Price List: literature number ..... 5965-1574EUS

For more information call 1-800-452-4844 or 1-303-452-4844 or via the Web through Access HP at <http://www.hp.com>

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