
HP 8719D, 8720D and 8722D Network Analyzers

Configuration Guide

HP 8719D, 50 MHz to 13.5 GHz
HP 8720D, 50 MHz to 20 GHz
HP 8722D, 50 MHz to 40 GHz

The HP 8720D family of microwave network analyzers integrates a microwave source, tuned-receiver, and S-parameter test set into a single, cost-effective instrument. To complete a microwave measurement system, select the desired network analyzer options, test port cables, and calibration kits. Also, additional measurement accessories may be selected.

Standard Network Analyzers

HP 8719D vector network analyzer, 50 MHz to 13.5 GHz
HP 8720D vector network analyzer, 50 MHz to 20 GHz
HP 8722D vector network analyzer, 50 MHz to 40 GHz

Included with a standard network analyzer is an installation and quick start guide, a user's guide, a quick-reference guide, a programmer's guide and example programs disk, a bandpass filter test device (P/N 0955-0446), and a 1-year on-site service warranty that may be converted to a 3-year return-to-HP service warranty.

Network Analyzers Preconfigured for Noncoaxial Applications

HP 8719DX includes the standard HP 8719D analyzer, the items listed above, plus Options 010, 012, 1D5, and 400

HP 8720DX includes the standard HP 8720D analyzer, the items listed above, plus Options 010, 012, 1D5, and 400

HP 8722DX includes the standard HP 8722D analyzer, the items listed above, plus Options 010, 012, 1D5, and 400

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Network Analyzer Options

Analyzer Options

- ❑ **1D5** high-stability frequency reference: replaces standard frequency reference with a higher stability unit.
- ❑ **007** mechanical transfer switch: replaces the solid-state transfer switch with a mechanical transfer switch. Increases test port power and dynamic range by 5 dB.
- ❑ **010** time-domain capability: allows time-domain measurements.
- ❑ **012** direct sampler access: configures the test set with direct access to A and B sampler receiver inputs. Operates as a standard instrument with the jumpers installed.
- ❑ **085** high-power S-parameter test set modification: deletes bias tees and adds a mechanical transfer switch and internal attenuators. Allows insertion of an amplifier before the transfer switch and insertion of isolators in the measurement configuration.
- ❑ **089** frequency offset mode: modifies the test set and firmware. Provides mixer measurement capability, allowing a receiver frequency offset from the source.
- ❑ **400** adds fourth sampler and TRL calibration firmware: replaces the transfer switch with a solid-state switch/splitter.

Hardware Options

- ❑ **1CM** adds rack mount flange kit for use without handles
- ❑ **1CP** adds rack mount flange kit for use with handles¹

Information Options

- ❑ **0BW** adds service guide (08720-90292)
- ❑ **0B0** deletes all user and programming guides
- ❑ **AV8** adds extra user and programming guides (08720-90288, 08720-90293)
- ❑ **ABF** adds French quick reference guide (08720-90283)
- ❑ **ABJ** adds Japanese quick reference guide (08720-90285)

Service Options

- ❑ **0Q8** includes factory-delivered service training.
- ❑ **W08** converts one year on-site repair warranty to three year return-to-HP repair warranty²
- ❑ **W31** adds two years of on-site repair
- ❑ **W32** adds three years of return-to-HP calibration
- ❑ **W34** adds three years of return-to-HP standards-compliant calibration
- ❑ **W51** adds five years of on-site repair
- ❑ **W52** adds five years of return-to-HP calibration
- ❑ **W54** adds five years of return-to-HP standards-compliant calibration

Certification Options

- ❑ **1BN** mil standard 45662A calibration certification
- ❑ **1BP** mil standard 45662A calibration certification with test data

Network Analyzer Option Compatibility

Option	Option 1D5	Option 007	Option 010	Option 012	Option 085	Option 089	Option 400
1D5 High-Stability Frequency Reference	—	Yes	Yes	Yes	Yes	Yes	Yes
007 Mechanical Transfer Switch	Yes	—	Yes	Yes	No ²	Yes	No ³
010 Time Domain	Yes	Yes	—	Yes	Yes	Yes	Yes
012 Direct Sampler Access	Yes	Yes	Yes	—	Yes	Yes	Yes
085 High-Power Test	Yes	No ⁴	Yes	Yes	—	Yes	No ^{3, 4}
089 Frequency Offset Mode	Yes	Yes	Yes	Yes	Yes	—	Yes
400 Four-Sampler Test Set	Yes	No ³	Yes	Yes	No ^{3, 4}	Yes	—
DX Noncoaxial Configuration	Included	No ³	Included	Included	No ^{3, 4}	Yes	Included

¹ The HP 8719D/8720D/8722D is supplied with handles.

² Applies only at time of purchase.

³ Option 400 uses solid-state switch splitter in place of transfer switch.

⁴ Option 085 requires and includes a mechanical transfer switch.

Measurement Accessories

Accessories are available in these connector types: 7 mm, K connector® (2.92 mm), type N, 3.5 mm (SMA-compatible), 2.4 mm coaxial, WR-90 (X Band), WR-62 (P Band), WR-42 (K Band), WR-28 (R Band)

For a complete list of Hewlett-Packard's coaxial and waveguide accessories, ask your Hewlett-Packard sales representative for the Coaxial and Waveguide Test Accessories Catalog (HP literature number 5091-4269E).

Calibration Kits

Coaxial measurements

For coaxial measurements, Hewlett-Packard offers two types of calibration kits:

Economy, includes:

- open standards (male and female)
- short standards (male and female)
- fixed-termination standards (male and female)
- in-series adapters

Standard, includes the devices in the economy kit and adds:

- sliding loads
- connector gages

Precision, includes the devices in the economy kit and adds:

- 50 ohm airline for TRL calibration
- TRL adapters
- connector tools

Waveguide measurements

For waveguide measurements, Hewlett-Packard offers calibration kits that include:

- waveguide-to-coax adapters (X, P, K)
- precision waveguide section
- flush short circuit
- fixed terminations
- straight section

Electronic calibration

Hewlett-Packard also offers electronic calibration systems. This system requires a control unit and electronic calibration kit. The calibration kit includes:

- highband ECal module
- torque wrench
- optional adapters
- optional lowband ECal module

Verification Kits

All Hewlett-Packard verification kits include:

- precision Z_0 airline
- mismatched airline
- fixed attenuators
- traceable measured data and uncertainties

Cables and Adapter Sets

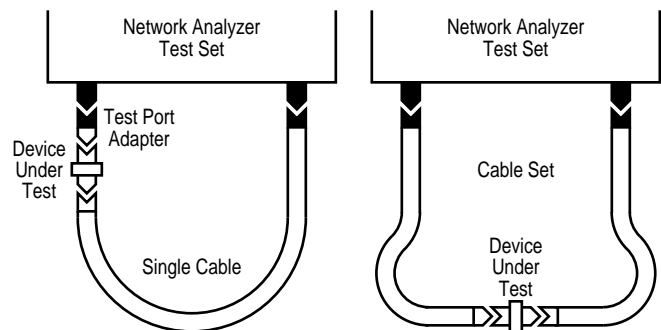
Hewlett-Packard offers cables in the following types:

- single cables in semi-rigid and flexible
- cable set in semi-rigid and flexible

There are also adapter sets available that protect the test port and convert the port to the desired connector interface. These kits contain:

- one male adapter
- one female adapter

To attain the best mechanical rigidity for device connection, use a single cable and the appropriate special adapter set. To attain the greatest flexibility for device connection, use a cable set.



Measurement Accessories *(continued)*

For Devices with 3.5 mm or SMA Connectors

Calibration Kits

- **HP 85052B** standard: 0.045 to 26.5 GHz. Includes:
 - 00902-60003 3.5 mm (m) fixed load
 - 00902-60004 3.5 mm (f) fixed load
 - 00911-60019 3.5 mm (m) sliding load
 - 00911-60020 3.5 mm (f) sliding load
 - 85052-60006 3.5 mm (m) short
 - 85052-60007 3.5 mm (f) short
 - 85052-60008 3.5 mm (m) open
 - 85052-60009 3.5 mm (f) open
 - 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
 - 85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
 - 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter
- **HP 85052B Option K11** PSC-3.5 slotless female center contact repair kit
- **HP 85052C⁶** precision TRL: 0.045 to 26.5 GHz. Includes:
 - 00902-60003 3.5 mm (m) fixed load
 - 00902-60004 3.5 mm (f) fixed load
 - 85052-60006 3.5 mm (m) short
 - 85052-60007 3.5 mm (f) short
 - 85052-60008 3.5 mm (m) open
 - 85052-60009 3.5 mm (f) open
 - 85052-60032 3.5 mm (f) to 3.5 mm (f) adapter
 - 85052-60033 3.5 mm (m) to 3.5 mm (m) adapter
 - 85052-60034 3.5 mm (f) to 3.5 mm (m) adapter
 - 85052-60035 3.5 mm short TRL line
 - 85052-60036 3.5 mm long TRL line
- **HP 85052D** economy: 0.045 to 26.5 GHz. Includes:
 - 00902-60003 3.5 mm (m) fixed load
 - 00902-60004 3.5 mm (f) fixed load
 - 00902-60006 3.5 mm (m) short
 - 00902-60007 3.5 mm (f) short
 - 00902-60008 3.5 mm (m) open
 - 00902-60009 3.5 mm (f) open
 - 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
 - 85052-60013 3.5 mm (f) to 3.5 mm (m) adapter
 - 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter
- **HP 85033D** economy: DC to 6 GHz. Includes:
 - 85052-60003 3.5 mm (f) to APC-7 adapter
 - 85052-60004 3.5 mm (m) to APC-7 adapter
 - 85033-60009 3.5 mm (m) load
 - 85033-60010 3.5 mm (f) load
 - 85033-60011 3.5 mm (m) open
 - 85033-60012 3.5 mm (f) open
 - 85033-60013 3.5 mm (m) short
 - 85033-60014 3.5 mm (f) short

- ❑ **HP 85062A**⁶ electronic: 1 to 26.5 GHz. Includes:
 - 85052-60012 3.5 mm (f) to 3.5 mm (f) adapter
 - 85052-60014 3.5 mm (m) to 3.5 mm (m) adapter
 - 85052-60001 3.5 mm (m) to 3.5 mm (f) lowband Ecal module
 - 85052-60002 3.5 mm (m) to 3.5 mm (f) highband Ecal module
- ❑ **Option 00M** substitutes:
 - 85052-60003 3.5 mm (m) to 3.5 mm (m) lowband Ecal module
 - 85052-60004 3.5 mm (m) to 3.5 mm (m) highband Ecal module
- ❑ **Option 00F** substitutes:
 - 85052-60005 3.5 mm (f) to 3.5 mm (f) lowband Ecal module
 - 85052-60006 3.5 mm (f) to 3.5 mm (f) highband Ecal module
- ❑ **Option 001** adds lowband electronic calibration (Ecal) module: 0.045 to 2 GHz
- ❑ **HP 85060C** electronic calibration (Ecal) control unit⁷

Verification Kits

- ❑ **HP 85053B** 0.045 to 26.5 GHz
 - ❑ **Option 1BP** MIL-STD 45662A calibration certificate with test data

Cables for either HP 8719D or 8720D

- ❑ **HP 85131C** single, semi-rigid: 3.5 mm to 3.5 mm, 81 cm, 32-inches
- ❑ **HP 85131D** set, semi-rigid: 3.5 mm to 3.5 mm, 53 cm each, 21-inches
- ❑ **HP 85131E** single, flexible: 3.5 mm to 3.5 mm, 81 cm, 32-inches
- ❑ **HP 85131F** set, flexible: 3.5 mm to 3.5 mm, 53 cm each, 21-inches

Cables for the HP 8722D

- ❑ **HP 85134C** single, semi-rigid: 3.5 mm to 2.4 mm, 81 cm, 32 inches
- ❑ **HP 85134D** set, semi-rigid: 3.5 mm to 2.4 mm, 53 cm each, 21 inches
- ❑ **HP 85134E** single, flexible: 3.5 mm to 2.4 mm, 81 cm, 32 inches
- ❑ **HP 85134F** set, flexible: 3.5 mm to 2.4 mm, 53 cm each, 21 inches

Adapter Sets

- ❑ **HP 85130D** HP 8719D/20D only: 3.5 mm⁸ to 3.5 mm
- ❑ **HP 85130F** HP 8722D only: 2.4 mm⁸ to 3.5 mm

⁵ Kit includes open and short circuits, fixed broadband loads, precision short air-lines, TRL adapters and 3.5 mm connector tools.

⁶ Requires an HP 85060C electronic calibration control unit.

⁷ Requires HP 85060 series calibration modules of the appropriate connector type.

⁸ Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

Measurement Accessories *(continued)*

For Devices with 7 mm Connectors

Calibration Kits

- **HP 85050B** standard: 0.045 to 18 GHz. Includes:
 - 00909-60008 7 mm coax termination
 - 85050-60006 7 mm fixed broadband load
 - 85050-80007 7 mm short
 - 85050-80010 7 mm open
 - 85050-80011 7 mm sliding load
- **HP 85050C**⁹ precision TRL: 0.045 to 18 GHz. Includes:
 - 00909-60008 7 mm coax termination
 - 85050-60003 7 mm to 7 mm airline
 - 85050-60005 7 mm to 7 mm TRL adapter
 - 85050-60006 7 mm fixed broadband load
 - 85050-80007 pin collet assembly
 - 85050-80008 7 mm short
 - 85050-80009 7 mm short collet
 - 85050-80010 7 mm open
- **HP 85050D** economy: 0.045 to 18 GHz. Includes:
 - 85050-60006 7 mm fixed broadband load
 - 85050-80007 7 mm short
 - 85050-80010 7 mm open
- **HP 85031B** economy: 30 kHz to 6 GHz. Includes:
 - 00909-60008 7 mm coax termination
 - 85050-60001 7 mm open/short
- **HP 85060A**¹⁰ electronic calibration (ECal) module: 1 to 18 GHz. Includes:
 - 85060-60002 7 mm highband Ecal module
 - **Option 001** adds:
 - 85060-60001 7 mm lowband Ecal module: 0.045 to 2 GHz
- **HP 85060C** electronic calibration (ECal) control unit¹¹

Verification Kit

- **HP 85051B** HP 8719D/20D only: 0.045 to 18 GHz
 - **Option 1BP** MIL-STD 45662A calibration certificate with test data

Cables for either HP 8719D or 8720D

- **HP 85132C** single, semi-rigid: 7 mm to 3.5 mm, 81 cm, 32 inches
- **HP 85132D** set, semi-rigid: 7 mm to 3.5 mm, 53 cm each, 21 inches
- **HP 85132E** single, flexible: 7 mm to 3.5 mm, 81 cm, 32 inches
- **HP 85132F** set, flexible: 7 mm to 3.5 mm, 53 cm each, 21 inches

Cables for the HP 8722D

- **HP 85135C** single, semi-rigid: 7 mm to 2.4 mm, 81 cm, 32 inches
- **HP 85135D** set, semi-rigid: 7 mm to 2.4 mm, 53 cm each, 21 inches
- **HP 85135E** single, flexible: 7 mm to 2.4 mm, 81 cm, 32 inches
- **HP 85135F** set, flexible: 7 mm to 2.4 mm, 53 cm each, 21 inches

Adapter Sets

- **HP 85130B** HP 8719D/20D only: 3.5 mm¹² to 7 mm
- **HP 85130E** HP 8722D only: 2.4 mm¹² to 7 mm

⁹ Kit includes open and short circuits, fixed loads, precision short airline, 7 mm connector tools and gages.

¹⁰ Requires an HP 85060C electronic calibration control unit.

¹¹ Requires HP 85060 series calibration modules of the appropriate connector type.

¹² Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

For Devices with Type-N Connectors

Calibration Kits

- ❑ **HP 85054B** standard: 0.045 to 18 GHz. Includes:
 - 00909-60011 type-N (m) fixed lowband load
 - 00909-60012 type-N (f) fixed lowband load
 - 85054-60025 type-N (m) short
 - 85054-60026 type-N (f) short
 - 85054-60027 type-N (m) open
 - 85054-60028 type-N (f) open
 - 85054-60031 type-N (f) to 7 mm adapter
 - 85054-60032 type-N (m) to 7 mm adapter
 - 85054-60037 type-N (f) to type-N (f) adapter
 - 85054-60038 type-N (m) to type-N (m) adapter
- ❑ **HP 85054B Option K11** PSC-N slotless contact repair kit
- ❑ **HP 85054D** economy: 0.045 to 18 GHz. Includes:
 - 85054-60025 type-N (m) short
 - 85054-60026 type-N (f) short
 - 85054-60027 type-N (m) open
 - 85054-60028 type-N (f) open
 - 85054-60031 type-N (f) to 7 mm adapter
 - 85054-60032 type-N (m) to 7 mm adapter
 - 85054-60037 type-N (f) to type-N (f) adapter
 - 85054-60038 type-N (m) to type-N (m) adapter
 - 85054-60046 type-N (m) fixed load
 - 85054-60047 type-N (f) fixed load
- ❑ **HP 85036B** 75 ohm: DC to 3 GHz. Includes:
 - 00909-60019 type-N (m) fixed 75 ohm load
 - 00909-60020 type-N (f) fixed 75 ohm load
 - 85032-20001 type-N (f) open
 - 85032-20007 type-N (m) open
 - 85032-20011 type-N (f) 75 ohm short
 - 85032-20012 type-N (m) 75 ohm short
 - 85032-20013 type-N (m) to type-N (m) 75 ohm adapter
 - 85032-20014 type-N (f) to type-N (f) 75 ohm adapter
 - 85032-20015 type-N (m) to type-N (f) 75 ohm adapter
- ❑ **HP 85036E** 75 ohm: type-N. Includes:
 - 00909-60019 type-N (m) fixed 75 ohm load
 - 85036-60016 type-N (m) fixed 75 ohm open/short
- ❑ **HP 85064A**¹³ electronic calibration (ECal) module: 1 to 18 GHz. Includes:
 - ❑ **Option 001** adds lowband ECal module: 0.045 to 2 GHz
 - ❑ **Option 00F** changes connectors to f-f
 - ❑ **Option 00M** changes connectors to m-m
- ❑ **HP 85060C** electronic calibration (ECal) control unit¹⁴

Verification Kit

- ❑ **HP 85055A** HP 8719D/8720D only: 0.045 to 18 GHz
 - ❑ **Option 1BPMIL-STD 45662A** calibration certificate with test data

Cables¹⁵

See 7 mm connector section

Adapter Set

- ❑ **HP 85130C** HP 8719D/20D only: 3.5 mm¹² to type-N

¹³ Requires an HP 85060C electronic calibration control unit.

¹⁴ Requires HP 85060 series calibration modules of the appropriate connector type.

¹⁵ Use the test port return cables recommended for devices with 7 mm connectors, and 7 mm to type-N adapters that are from the HP 85054B/D type-N calibration kit.

Measurement Accessories *(continued)*

For Devices with 2.4 mm Connectors

Calibration Kits

- **HP 85056A** standard: 0.045 to 50 GHz. Includes:
 - 00901-60003 2.4 mm (m) fixed broadband load
 - 00901-60004 2.4 mm (f) fixed broadband load
 - 00915-60003 2.4 mm (m) sliding load
 - 00915-60004 2.4 mm (f) sliding load
 - 85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
 - 85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
 - 85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
 - 85056-60020 2.4 mm (m) short
 - 85056-60021 2.4 mm (f) short
 - 85056-60022 2.4 mm (m) open
 - 85056-60023 2.4 mm (f) open
- **HP 85056D** economy: 0.045 to 50 GHz. Includes:
 - 00901-60003 2.4 mm (m) fixed broadband load
 - 00901-60004 2.4 mm (f) fixed broadband load
 - 85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
 - 85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
 - 85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
 - 85056-60020 2.4 mm (m) short
 - 85056-60021 2.4 mm (f) short
 - 85056-60022 2.4 mm (m) open
 - 85056-60023 2.4 mm (f) open

Verification Kit

- **HP 85057B** HP 8722D only: 0.045 to 50 GHz
 - **Option 1BP** MIL-STD 45662A calibration certificate with test data

Cables for the HP 8722D

- **HP 85133C** single, semi-rigid: 2.4 mm, 81 cm, 32 inches
- **HP 85133D** set, semi-rigid: 2.4 mm, 53 cm each, 21 inches
- **HP 85133E** single, flexible: 2.4 mm, 81 cm, 32 inches
- **HP 85133F** set, flexible: 2.4 mm, 53 cm each, 21 inches

Adapter Set

- **HP 85130G** HP 8722D only: 2.4 mm¹⁶ to 2.4 mm

For Devices with K Connectors® (2.92 mm)

Calibration Kit

- **HP 85056K**¹⁷ economy, 2.92/2.4 mm: 0.045 to 40 GHz. Includes:
 - 00901-60003 2.4 mm (m) fixed broadband load
 - 00901-60004 2.4 mm (f) fixed broadband load
 - 00915-60003 2.4 mm (m) sliding load
 - 00915-60004 2.4 mm (f) sliding load
 - 11904-60001 2.4 mm (m) to 2.92 mm (m) adapter
 - 11904-60002 2.4 mm (f) to 2.92 mm (f) adapter
 - 11904-60003 2.4 mm (m) to 2.92 mm (f) adapter
 - 11904-60004 2.4 mm (f) to 2.92 mm (m) adapter
 - 85056-60005 2.4 mm (m) to 2.4 mm (m) adapter
 - 85056-60006 2.4 mm (f) to 2.4 mm (f) adapter
 - 85056-60007 2.4 mm (m) to 2.4 mm (f) adapter
 - 85056-60020 2.4 mm (m) short
 - 85056-60021 2.4 mm (f) short
 - 85056-60022 2.4 mm (m) open
 - 85056-60023 2.4 mm (f) open
- **Option 001** adds 2.4 mm sliding loads and gages

Cables¹⁸

- **HP 85133C** single, semi-rigid: 2.4 mm, 81 cm, 32 inches
- **HP 85133D** set, semi-rigid: 2.4 mm, 53 cm each, 21 inches
- **HP 85133E** single, flexible: 2.4 mm, 81 cm, 32 inches
- **HP 85133F** set, flexible: 2.4 mm, 53 cm each, 21 inches

Adapters

- **HP 11904A** 2.4 mm¹⁶ to K (m)
- **HP 11904B** 2.4 mm¹⁶ to K (f)
- **HP 11904C** 2.4 mm¹⁶ to K (f)
- **HP 11904D** 2.4 mm¹⁶ to K (m)
- **HP 11904S** 2.4 mm¹⁶ to K adapter set

¹⁶ Special rugged female connector specifically for connecting to the network analyzer test port, but does not mate with a standard male connector.

¹⁷ This kit can be used to calibrate in the 2.4 mm interface, as well as measure in the 2.92 mm (K connector).

¹⁸ 2.4 mm to K type adapters are required in addition to these cables.

For Devices with Waveguide

X-Band

- ❑ **HP X11644A** calibration kit (standard, WR-90, 8.2 to 12.4 GHz). Includes:
 - 00896-60008 X-band standard section
 - 00910-60003 X-band termination
 - 11644-20018 X-band short
 - 11644-20021 X-band shim (open)
 - X281C waveguide to 7 mm coax adapter
- ❑ **HP 8719D/20D, HP 85132F** cable set (set, flexible, 7 to 3.5 mm, 53 cm each, 21 inches)
- ❑ **HP 8722D, HP 85135F** cable set (set, flexible, 7 to 2.4 mm, 53 cm each, 21 inches)
- ❑ **HP X281C** adapter (included in calibration kit): WR-90 to 7 mm

P Band

- ❑ **HP P11644A** calibration kit (standard, WR-62, 12.4 to 18 GHz). Includes:
 - 00896-60007 P-band standard section
 - 00910-60002 P-band termination
 - 11644-20017 P-band short
 - 11644-20020 P-band shim (open)
 - P281C waveguide to 7 mm coax adapter
- ❑ **HP 8719D/20D, HP 85132F** cable set (flexible, 7 to 3.5 mm, 53 cm each, 21 inches)
- ❑ **HP 8722D, HP 85135F** cable set (flexible, 7 to 2.4 mm, 53 cm each, 21 inches)
- ❑ **HP P281C** adapter (included in calibration kit): WR-62 to 7 mm

K Band

- ❑ **HP K11644A** calibration kit (standard, WR-42, 18 to 26.5 GHz). Includes:
 - 00896-60006 K-band standard section
 - 00910-60001 K-band termination
 - 11644-20016 K-band short
 - 11644-20019 K-band shim (open)
 - K281C waveguide to 3.5 mm (f) coax adapter
- ❑ **HP 8719D/20D, HP 85131F** cable set (set, flexible, 3.5 to 3.5 mm, 53 cm each, 21 inches)
- ❑ **HP 8722D, HP 85134F** cable set (set, flexible, 3.5 to 2.4 mm, 53 cm each, 21 inches)
- ❑ **HP K281C** adapter (included in calibration kit): WR-42 to 3.5 mm (f)
 - ❑ **Option 012** WR-42 to 3.5 mm (m)

R Band

- ❑ **HP R11644A** calibration kit (standard, WR-28, 26.5-40 GHz). Includes:
 - 00914-60028 R-band termination
 - 11644-20005 R-band short
 - 11644-20003 R-band shim (open)
 - 11644-60001 R-band 10 cm straight waveguide
 - 11644-60016 R-band 5 cm straight waveguide
- ❑ **HP 8722D, HP 85133F** cable set (set, flexible, 2.4 mm, 53 cm each, 21 inches)
- ❑ **HP R281A** adapter (2.4 mm (f) to WR-28 waveguide adapter)
- ❑ **HP R281B** adapter (2.4 mm (m) to WR-28 waveguide adapter)

Test Configuration Accessories

Power Meters¹⁹

- ❑ **HP 437B** digital average
- ❑ **HP 438A** dual channel

Power Sensors

- ❑ **HP 8481B** 10 MHz to 18 GHz, type-N (m), 25 watt
- ❑ **HP 8482B** 100 kHz to 4.2 GHz, type-N (m), 25 watt
- ❑ **HP 8485A** 50 MHz to 26.5 GHz, APC-3.5 mm (m), 100 mW
- ❑ **HP 8481A** 10 MHz to 18 GHz, type-N (m), 100 mW
- ❑ **HP 8482A** 100 kHz to 4.2 GHz, type-N (m), 100 mW
- ❑ **HP 8483A** 100 kHz to 2 GHz, type-N (m), 75 ohm, 100 mW
- ❑ **HP R8486A** 26 GHz to 40 GHz, waveguide flange UG-599/U, 100 mW
- ❑ **HP 8487A** 50 MHz to 50 GHz, 2.4 mm (m), 100 mW

Power Amplifiers²⁰

- ❑ **HP 83006A** 0.01 to 26.5 GHz, 20 dB gain, power out:
+18 dBm to 10 GHz or +16 dBm to 20 GHz or +14 dBm to 26.5 GHz
- ❑ **HP 83017A** 0.05 to 26.5 GHz, 25 dB gain, power out:
+20 dBm to 20 GHz or +15 dBm to 26.5 GHz
- ❑ **HP 83018A** 2 to 26.5 GHz, 27 dB gain to 20 GHz or 23 dB to
26.5 GHz, power out: +24 dBm to 20GHz or +21 dBm to 26.5 GHz
- ❑ **HP 83020A** 2 to 26.5 GHz, 30 dB gain to 20 GHz or 27 dB to
26.5 GHz, power out: +30 dBm to 20 GHz or +26 dBm to 26.5 GHz
- ❑ **HP 83050A** 2 to 50 GHz, 21 dB gain, power out:
+20 dBm to 40 GHz or +17 dBm to 50 GHz
- ❑ **HP 83051A** pre-amplifier, 0.045 to 50 GHz, 23 dB gain, power out:
+12 dBm to 45 GHz or +10 dBm to 50 GHz

Couplers

- ❑ **HP 87300B** coaxial: 1 to 20 GHz, SMA (f), 10 dB coupling
- ❑ **HP 87300C** coaxial: 1 to 26.5 GHz, 3.5 mm (f), 13 dB coupling
- ❑ **HP 87301D** coaxial: 1 to 40 GHz, 2.4 mm (f) or optional
2.92 mm (f), 13 dB coupling
- ❑ **HP 87310B** coaxial: 1 to 18 GHz, SMA (f), 3 dB coupling
- ❑ **HP 87310B** Option 020 coaxial: 1 to 26.5 GHz, SMA (f), 20 dB coupling
- ❑ **HP 87301E** coaxial: 2 to 50 GHz, 2.4 mm (f), 10 dB coupling

Test Fixtures

For TRL/LRM and TOSL calibration standards, microstrip adapters, and test fixtures, HP recommends ICM²¹ Adjustable Test Fixture Mainframe Series-TF-3000, which is compatible with the ICM TRL-3000 Series Calibration Kits.

- ❑ **HP 85041A** transistor test fixture: 45 MHz to 18 GHz²²
- ❑ **HP 11608A** transistor fixture: DC to 12.4 GHz

¹⁹ A power meter with the appropriate HP 8480-series power sensor is required for use with the power meter calibration feature.

²⁰ RF connectors: 3.5 mm (f) on RF input and output; BNC (f) detector out 2.4 mm (f) on RF input and output for HP 85050A, 83051A.

²¹ Inter-Continental Microwave, 1515 Wyatt Drive, Santa Clara, CA 95054-1524, Telephone: (408) 727-1596 Fax: (408) 727-0105

²² Must use with HP 85014C active device measurement software. Includes inserts for 0.070 inch and 0.100 inch stripline packaged transistors. Also order appropriate 7 mm calibration kit and cables.

Bias Supplies²³

- ❑ **HP 6626A** precision DC power supply; 2 A, 50 V maximum
- ❑ **HP 6629A** quad-out precision HP-IB DC power supply
- ❑ **HP 14852A** bias interconnect cable
- ❑ **HP 4142B** modular DC source/monitor; 10 A, 200 V maximum

Bias Networks²⁴

- ❑ **HP 11590B** 100 MHz to 12.4 GHz, type-N, 0.5 A and 100 V maximum bias
 - ❑ **Option 001** 100 MHz to 18 GHz, 7 mm, 0.5 A and 100 V maximum bias
- ❑ **HP 11612A** 45 MHz to 26.5 GHz, 3.5 mm (f), 0.5 A and 40 V maximum bias
 - ❑ **Option 001** 2 A maximum bias
- ❑ **HP 11612B** 45 MHz to 50 GHz, 2.4 mm (f), 0.5 A maximum bias

System Software

- ❑ **HP 85070B** high-temperature dielectric probe kit²⁵
 - ❑ Option 300 HP BASIC; runs on BASIC 5.0 or higher, 3 1/2-inch disk
- ❑ **HP 85071B** materials measurement software²⁶ (MS-DOS®)
 - ❑ Option 300 HP BASIC; runs on BASIC 5.0 or higher, 3 1/2-inch disk
- ❑ **HP 85014C** active device measurement software²⁷
- ❑ **HP 85190A** IC-CAP modeling suite²⁸
- ❑ **Design Software**, HP microwave design system series (MDS) and HP series IV²⁸ connector repair kits

Application Support

- ❑ **HP 50629A** system startup assistance; provides one-half day (4 hours) of on-site assistance for initial instrument/system startup. Includes travel charges through Zone 4.

²³ For internally biasing with the HP 8719D/8720D/8722D.

²⁴ For supplying DC bias externally from test sets. Internal bias networks have a current limit of 0.5 A.

²⁵ Includes the dielectric probe, software on 3.5 inch disk, cables, port/cable adapters, switch, short circuit, mounting bracket, adapters, 50-ohm termination, stand, vials, and stoppers. Measures complex permittivity of materials. Standard software version runs on PC or PC-compatible MS-DOS® 3.20 or higher and Microsoft Windows 3.0 or 3.1.

²⁶ Measures complex permeability and permittivity of materials in a transmission line environment.

²⁷ Controls biasing and data storage for FETs and BJTs. Requires BASIC 5.0 (or higher) and 2 Mbytes of RAM. (3 1/2-inch disk)

²⁸ Consult with an HP systems application engineer. The product you order will depend on the test environment.

²⁹ For a printer compatibility guide for network and spectrum analyzers, contact your HP representative.

³⁰ This printer will also accept plot files.

³¹ LaserJet II and IV can also accept plot files.

³² The analyzer can accept most PC-AT-compatible keyboards with a standard DIN connector. Keyboards with a mini-DIN connector are compatible with the HP C1405-60015 adapter.

³³ Rack is 123.7 cm (48.7 inches) high x 60 cm (23.6 inches) wide x 80 cm (31.5 inches) deep. Supplied with anti-static mat, support rails, rack mounting kits, power distribution, and two HP 10833A HP-IB cables.

³⁴ The HP 8719D/8720D/8722D is supplied with handles.

Peripheral Accessories

Printers²⁹

- ☐ **HP C2170A** DeskJet 520 (parallel, monochrome)
- ☐ **HP C2184A** DeskJet 600 (parallel, monochrome; color-capable)
- ☐ **HP C2164A** DeskJet 660C (parallel, color)
- ☐ **HP C2145A** DeskJet 850C (parallel, color)
- ☐ **HP C3540A** DeskJet 1600C (parallel, color)³⁰
- ☐ **HP C2655A** DeskJet Portable 340 (parallel, monochrome; color-capable)
- ☐ **HP C3150A** LaserJet 5P (parallel, monochrome)³¹

Interface Cables

- ☐ **HP 10833A** HP-IB cable: 1.0 m (3.3 ft.)
- ☐ **HP 10833B** HP-IB cable: 2.0 m (6.6 ft.)
- ☐ **HP 10833D** HP-IB cable: 0.5 m (1.6 ft.)
- ☐ **HP C2913A** RS-232C interface cable: 1.2 m (3.9 ft.)
- ☐ **HP C2914A** serial interface cable: 1.2 m (3.9 ft.)
- ☐ **HP 24542G** RS232C F/M cable: 3 m (9.9 ft.)
- ☐ **HP 24542D** RS-232C interface cable: 3 m (9.9 ft.)

Keyboard³²

- ☐ **HP C1405B** Option ABA keyboard, also order adapter HP C1405-60015

Equipment Racks

- ☐ **HP 85043D** system rack kit.³³ Also order the following:
 - ☐ **HP 40104A** 7-inch filler panel
 - ☐ **HP 5063-9223** rack mount flange kit, for use with handles; includes handles³⁴
 - ☐ **HP 5063-9236** rack mount kit, for use with handles; does not include handles. May be ordered as Option 1CP.
 - ☐ **HP 5063-9216** rack mount kit, for use without handles. May be ordered as Option 1CM.
 - ☐ **HP 5063-9229** front handle kit; includes handles only³⁴
 - ☐ **HP 1181A** system testmobile, 3 ft. tall (see HP literature number 5091-1233E)
 - ☐ **HP 1540-1695** operating case
 - ☐ **HP 9211-2657** transit case

Computers

- ☐ Any computer configured with an HP-IB interface card and software drivers

Monitors

- ☐ Any VGA-compatible monitor

Upgrades

Network Analyzer Upgrade Kits

- ❑ **HP 8719DU** plus the upgrade option designations below for the HP 8719D
- ❑ **HP 8720DU** plus the upgrade option designations below for the HP 8720D
- ❑ **HP 8722DU** plus the upgrade option designations below for the HP 8722D

Upgrade Kit Options

- ❑ **007** adds mechanical S-parameter transfer switch. Includes installation by HP service engineer at service center.
- ❑ **010** adds time domain capability. Includes installation by HP service engineer at customer site or service center.
- ❑ **012** modifies S-parameter test set for direct sampler access. Front panel jumpers also allow standard instrument operation. Includes installation by HP service engineer at service center.
- ❑ **020** for HP 8719D only. Adds 20 GHz operation. Includes installation by HP service engineer at HP service center.
- ❑ **040** for HP 8719D and 8720D only. Adds 40 GHz operation. Includes installation at HP factory.
- ❑ **085** modifies S-parameter test set for high power measurement capability. Includes installation by HP service engineer at HP service center.
- ❑ **089** modifies S-parameter test set and firmware for frequency offset mixer test capability. Includes installation by HP service engineer at HP service center.
- ❑ **1D5** adds high stability time base. Includes installation by HP service engineer at service center.
- ❑ **400** adds fourth sampler and TRL calibration firmware. Includes installation by HP service engineer at HP service center.

Literature and Documents

Part / Literature Number

❑ Application Note 1217-1 , Basics of Measuring the Dielectric Properties of Materials	5091-3300E
❑ Product Note 8510-8A , Applying TRL Cal to Non-coaxial Measurements	5091-3645E
❑ Product Note: 85150-1 , Using Instruments with MDS	5091-1702E
❑ Product Note 8720-1 , Amplifier Measurements with the HP 8720C	5091-1942E
❑ Product Note 8720-2 , In-Fixture Measurements with the HP 8720C	5091-1943E
❑ Product Note 8753-3 , Applications of the Test Sequence Function	08753-90133
❑ Product Note 8753-2A , Mixer Measurements using the HP 8753 Network Analyzer	5952-2771
❑ HP 8719D/8720D/8722D Installation and Quick Start Guide	08720-90291
❑ HP 8719D/8720D/8722D Network Analyzer User's Guide	08720-90288
❑ HP 8719D/8720D/8722D Network Analyzer Quick Reference Guide	08720-90289
❑ HP 8719D/8720D/8722D Network Analyzer Programmer's Guide	08720-90293
❑ HP 8719D/8720D/8722D Network Analyzer Service Guide	08720-90292



For more information on Hewlett-Packard Test and Measurement products, applications or services please call your local Hewlett-Packard sales offices. A current listing is available via the World-wide Web through AccessHP at <http://www.hp.com>. If you do not have access to the Internet please contact one of the HP centers listed below and they will direct you to your nearest HP representative.

United States:

Hewlett-Packard Company
Test and Measurement Organization
5301 Stevens Creek Blvd.
Bldg. 51L-SC
Santa Clara, CA 95052-8059
1 800 452 4844

Canada:

Hewlett-Packard Canada Ltd.
5150 Spectrum Way
Mississauga, Ontario
L4W 5G1
(905) 206 4725

Europe:

Hewlett-Packard
European Marketing Centre
P.O. Box 999
1180 AZ Amstelveen
The Netherlands

Japan:

Yokogawa-Hewlett-Packard Ltd.
Measurement Assistance Center
9-1, Takakura-Cho, Hachioji-Shi,
Tokyo 192, Japan
(81) 426 48 3860

Latin America:

Hewlett-Packard
Latin American Region Headquarters
5200 Blue Lagoon Drive, 9th Floor
Miami, Florida 33126, U.S.A.
(305) 267 4245/4220

Australia/New Zealand:

Hewlett-Packard Australia Ltd.
31-41 Joseph Street
Blackburn, Victoria 3130, Australia
131 347 Ext. 2902

Asia Pacific:

Hewlett-Packard Asia Pacific Ltd.
17-21/F Shell Tower, Time Square,
1 Matheson Street, Causeway Bay,
Hong Kong
(852) 2599 7070

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