

# Installation Note

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**Agilent Technologies 8719D, 8720D, and 8722D  
Network Analyzers Firmware Upgrade Kit Revision 6.4  
Kit Number 08720-60168**



**Part Number 08720-90362**

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**Notice.**

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PRODUCT AFFECTED:	Agilent 8719D, 8720D, and 8722D Network Analyzers
SERIAL NUMBERS:	All serials
TO BE PERFORMED BY:	[X] Agilent Service Center [X] Agilent personnel on-site
ESTIMATED INSTALLATION TIME:	20 minutes
ESTIMATED VERIFICATION TIME:	30 minutes (not included in the kit price)

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## Description

This note contains the information required to update the firmware in the Agilent 8719D, 8720D and 8722D analyzers. The EPROMs can be installed using the following procedure.

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**Caution** This installation note is intended for Agilent personnel only. The analyzer warranty will be *VOID* if this firmware installation is performed by anyone other than Agilent personnel.

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## Installation Kit Parts List

**Table 1. Firmware Upgrade Kit Contents  
(Agilent Part Number 08720-60168)**

Qty	Description	Part Number
1	A7U4 EPROM	08720-80092
1	A7U5 EPROM	08720-80093
1	A7U24 EPROM	08720-80094
1	A7U25 EPROM	08720-80095
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## Equipment and Tools Required

**Table 2. Required Equipment and Tools**

Item	Part/Model Number
T-10 TORX Screwdriver	9300-1367 9300-0980 9300-0797
T-15 TORX Screwdriver	
Medium Flat-Blade Screwdriver	
Anti-Static Wrist Strap	
Anti-Static Wrist Strap Cord	
Static-Control Table Mat and Earth Ground Wire	

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## Safety Considerations

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<b>Warning</b>	<b>Before you disassemble the instrument, turn the power switch OFF and unplug the instrument. Failure to unplug the instrument can result in personal injury.</b>
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<b>Caution</b>	Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. Refer to the documentation that pertains to your instrument for information about static-safe workstations and ordering static-safe accessories.
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## Preliminary Operation Check

1. Press **[Preset]** **[System]** **SERVICE MENU** **TESTS** **[21]** **[x1]** **EXECUTE TEST**.
2. Follow the displayed prompts for making the necessary connections.
3. Press **CONTINUE**.

When the analyzer passes the test, it will display: PORT 1 Op Chk DONE.

4. Press **RETURN** **TESTS** **[22]** **[x1]** **EXECUTE TEST**.
5. Follow the displayed prompts for making the necessary connections.
6. Press **CONTINUE**.

When the analyzer passes the test, it will display: PORT 2 Op Chk DONE.

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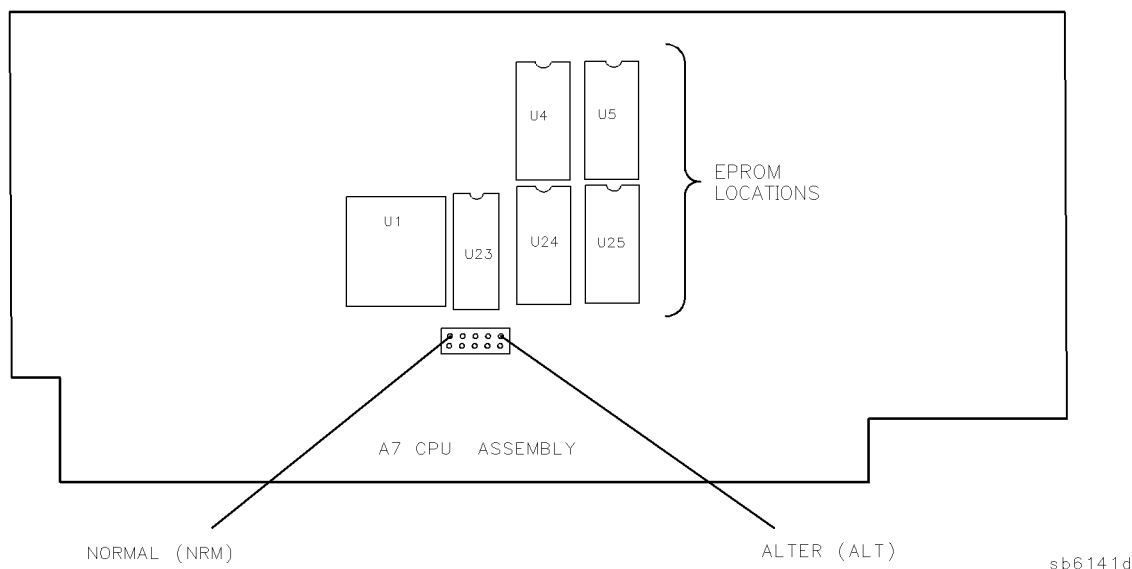
<b>Note</b>	If either check did not pass, the instrument must be adjusted or repaired before being upgraded. Notify the customer of the costs involved and obtain permission to proceed before doing so. Repairs are <i>not</i> part of the upgrade installation.
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## Installation Procedure

1. Put on the anti-static wrist strap, that is connected to the anti-static mat and earth ground.
2. Remove the power line cord from the analyzer.
3. Set the analyzer on its side.
4. Remove the two corner bumpers from the bottom of the instrument with the T-15 TORX screwdriver.
5. Loosen the captive screw on the bottom cover's back edge with the T-15 TORX screwdriver.
6. Slide the cover toward the rear of the instrument.
7. Carefully pry the EPROMs from their sockets on the A7 CPU board assembly with a flat blade screwdriver. The labels have the revision number and the reference designator printed on them. Their locations are shown in Figure 1. Although this operation requires moderate force, avoid bending the pins.



**Figure 1. Component Location Diagram**

8. Insert the EPROMs, provided in this kit, into the sockets. Refer to Figure 1 for correct placement and orientation. Visually confirm that all the pins of each EPROM are correctly seated in the socket and that the EPROMs have the correct revision.
9. Move the A7 CC jumper from the normal (NRM) operating position to the alternate (ALT) position as shown in Figure 1.
10. Reconnect the power line cord and switch on the instrument. At the completion of the self-test, the displayed revision number should match the revision number on the EPROMs. If not, recheck all EPROMs for correct location, the correct insertion (no pins folded inside or outside sockets), and the correct revision number on the label.
11. Press **(SYSTEM)** **SERVICE MENU** **PEEK/POKE** **RESET MEMORY** **(PRESET)**, then switch the instrument off and back on again.
12. Press **(SYSTEM)** **SERVICE MENU** **PEEK/POKE** **PEEK/POKE ADDRESS** **(5243326)** **(x1)** **POKE** **(30)** **(x1)**. These key presses enable the power overrange/underrange feature.
13. To verify that the instrument is functioning correctly, press **(Preset)** **(System)** **SERVICE MENU** **TESTS** **(0)** **(x1)** **EXECUTE TEST**. When the test is complete, the analyzer should display:  
ALL INT PASS  
If it does not, refer to the *Agilent 8719D/20D/22D Network Analyzer Service Guide* for troubleshooting information.
14. Remove the power line cord from the analyzer.
15. Move the A7 CC jumper from the alternate (ALT) position to the normal (NRM) operating position as shown in Figure 1.
16. Slide the cover toward the front of the instrument.

17. Tighten the captive screw on the bottom cover's back edge with the T-15 TORX screwdriver.
18. Install the two corner bumpers from the bottom of the instrument with the T-15 TORX screwdriver.

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## Firmware History

### Revision 6.14

#### Firmware Enhancements and Features

1. A major improvement has been made in disk writes for the CITIfile and S2P (Touchstone) ASCII formats.
2. Error numbers (error table) are now synchronized with all revisions.
3. Data files with S2P now have suffixes dependent on the channel number (S1/2).
4. In operating parameters pages, the specific model number has been replaced with the word ANALYZER.
5. Calibration kit labels under the SELECT CAL KIT menu now include the Agilent calibration kit most commonly associated with that connector geometry.
6. Changed the list table default frequency from MHz to GHz.
7. Updated the 7mm calibration constants based on the Agilent 85050 series calibration kits.
8. The DEFINE STANDARD menu for the selection of calibration standard “type” has been changed. To access this menu, press **CAL** **CAL KIT** **MODIFY** **DEFINE STANDARD**. The choices of open, short, load, delay/thru, and arbitrary impedance now work the same as the choices in other “one-of-n” menus. (For a “one-of-n” menu example, press the **FORMAT** key.) The DEFINE STANDARD menu remains displayed after pressing **OPEN**, or **SHORT**, or whatever “type” the user has selected, thus showing the latest selection for a particular calibration standard number. Further, a new message box appears above the active entry for calibration standard number. The message reads, “Select # with arrow keys, then press **MODIFY STD**”. Pressing the new softkey **MODIFY STD DEFINITION** then brings up the menu appropriate for the “type.” For example, if an open was selected, the **C0**, **C1**, etc. menu appears. If a load was selected, the **FIXED**, **SLIDING**, etc. menu appears.

These changes help the front panel user only. GPIB operation remains unchanged.

#### Firmware Problems Fixed

1. Fixed the problem experienced with downloading cal coefficients using INPUCALC when the number of coefficients in the current I-state does not match the download number of points.
2. Fixed the ADC offset correction test to avoid spurs when finding the most linear region.
3. Fixed the slow GPIB access to the internal disk.
4. Fixed the POSSIBLE FALSE LOCK error message from appearing at incorrect times.
5. Option 400: fixed the loss of phase lock experienced under the following conditions— during the first sweep after test set switching, with power meter calibration on one port.

- Fixed R channel drop-out when sweeping under the following conditions— CF= 2.55 GHz, Span= 100 MHz.

## Revision D.06.12

### Firmware Enhancements and Features

- Minor improvements have been made to the user interface for disk operations. The file last selected on the disk directory page is remembered when the user selects SAVE/RECALL. If the user tries to save a file to the internal disk drive when the disk has been removed, the internal disk drive remains the selected drive.
- The capability to store S-parameter data to component data files using the “Touchstone” format (S2P) has been added.
- A new IF bandwidth filter setting of 3700 Hz has been added.
- The individual power ranges will now allow 3 dB over and under the values shown with each power range selection. To enable the power overrange/underrange feature, press **(SYSTEM) SERVICE MENU PEEK/POKE PEEK/POKE ADDRESS (5243326) (x1) POKE (30) (x1)**.
- Enhancements have been made to the file naming capability for files generated by the instrument during execution of a sequence. The new menu can be found by pressing **(SAVE/RECALL) FILE UTILITIES SEQUENCE FILENAMING**. The TITLE FILE menu also gained a new softkey to support the inclusion of the sequence loop counter in the filenames.
- A method of external calibration, Take 4 mode, provides a remote-only command that directs the network analyzer to take a single “group” or sweep (consisting of a forward and reverse sweep) and to collect the raw data for all 4 S-parameters. The user can then extract the raw data for the S-parameters (or the pre-raw data, which has not had sampler correction nor attenuator offsets applied) and perform the error correction in an external computer (using previously extracted calibration arrays).
- The following is a new choice from the CONFIGURE menu, selected by pressing **(SYSTEM) CONFIGURE**:
  - **RAW OFFSET** Toggles attenuator and sampler cal offsets on or off.
- A new feature, Adapter Removal, is designed for cases where the device under test is “non-insertable” and thus an adapter is required. This feature requires two full 2-port calibrations, one for each port, and subsequently provides a calibration for the test device with the effects of the adapter removed. The menu is found by pressing **(CAL) MORE ADAPTER REMOVAL**.

- New GPIB commands:

GPIB Cmd	Description
<b>IFBW3700</b>	Set IF Bandwidth to 3700 Hz.
<b>SWPSTART</b>	Sweep start (Take4).
<b>RAWOFFS&lt;ON OFF&gt;</b>	Raw Offsets (Take4).
<b>TAKE4&lt;ON OFF&gt;</b>	Enable/disable Take4 mode.
<b>OUTPPREx</b>	Output “pre-raw” arrays, x=1-4 (Take4).



<b>TITP</b>	Title Plot to Disk file.
<b>TITF0</b>	Title the save state filename, only in sequence mode.
<b>ADAP1[D]</b>	Set adapter electrical delay.
<b>ADPTCOAX</b>	Set adapter to COAXial.
<b>ADPTWAVE</b>	Set adapter to WAVEguide.
<b>MODS</b>	Compute new cal set using adapter removal.
<b>CALSPORT1</b>	Recall cal set associated with Port 1 for adapter removal.
<b>CALSPORT2</b>	Recall cal set associated with Port 2 for adapter removal.

10. Additional Limit Line and Data Point Functions:

- These GPIB-only functions are a portion of the Option K96 functions that have sufficiently broad applicability to be added to the standard firmware set.

<b>GPIB Cmd</b>	<b>Description</b>
<b>MINMAX</b>	Enable/disable min/max recording per segment. Min and max values are recorded per limit segment.
<b>OUTPAMAX</b>	Output max values for all limit line segments.
<b>OUTPAMIN</b>	Output min values for all limit line segments.
<b>OUTPSEGM</b>	Output limit test min/max all segments. Output the segment number, max stimulus, max value, min stimulus, min value for all active segments.
<b>OUTPSEGM[n]</b>	Output limit test min/max for a specified segment.
<b>SELSEG[n]</b>	Select segment number for the OUTPSEGF and OUTPSEGM commands to report on.
<b>SELMAXPT</b>	Select the last point number in the range of points that the OUTPDATR command will report.
<b>SELMINPT</b>	Select the first point number in the range of points that the OUTPDATR command will report.
<b>SELPT[n]</b>	Select point number that OUTPDATP will report.
<b>OUTPDATP</b>	Output trace data indexed by point (see SELPT).
<b>OUTPDATR</b>	Output trace data for range of points (see SELMINPT, SELMAXPT).
<b>OUTPLIM1</b>	Output status of limit test for channel 1.
<b>OUTPLIM2</b>	Output status of limit test for channel 2.
<b>SELSEG[n]</b>	Select segment number for the OUTPSEGF and OUTPSEGM commands to report on.
<b>OUTPSEGAFF</b>	Output the segment number and its status for all active segments.
<b>OUTPSEGF</b>	Output limit test status per segment.
<b>OUTPFAIP</b>	Output Fail Point: this command is similar to OUTPLIMF except that it reports the number of failures first, followed by the stimulus and trace values for each failed point in the test (note: use command LIMITEST<ON> to function properly).

For more information concerning these firmware revision 6.12 enhancements and features, see the following:

Title	Part Number	Rev.
8719D/20D/22D Network Analyzer User's Guide	08720-90288	Jul 97
8719D/20D/22D Network Analyzer Programmer's Guide	08720-90293	Jul 97
8719D/20D/22D Network Analyzer Service Guide	08720-90292	Jul 97
8719D, 8720D, 8722D, 8753D Programming Examples Disk: HP BASIC	08753-10028	Jul 97
8719D, 8720D, 8722D, 8753D Programming Examples Disk: QuickC & QuickBASIC	08753-10029	Jul 97

By internet, phone, or fax, get assistance with all your test & measurement needs.

**Table 1-1. Contacting Agilent**

**Online Assistance:** [www.agilent.com/find/assist](http://www.agilent.com/find/assist)

**United States**

(tel) 1 800 452 4844

**Japan**

(tel) (81) 426 56 7832

(fax) (81) 426 56 7840

**New Zealand**

(tel) 0 800 738 378

(fax) 64 4 495 8950

**Canada**

(tel) 1 877 894 4414

(fax) (905) 206 4120

**Latin America**

(tel) (305) 269 7500

(fax) (305) 269 7599

**Asia Pacific**

(tel) (852) 3197 7777

(fax) (852) 2506 9284

**Europe**

(tel) (31 20) 547 2323

(fax) (31 20) 547 2390

**Australia**

(tel) 1 800 629 485

(fax) (61 3) 9210 5947