

Spectrum Analyzers

Upgrade Kits

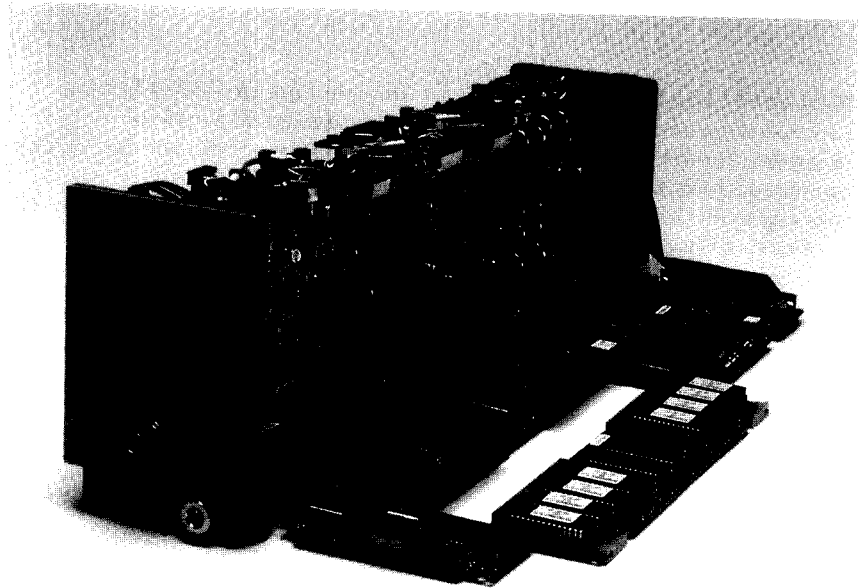
HP 70860A/70861A

*Upgrade kits for the
HP 70900A/B local oscillator*

*Speed up your modular
spectrum analyzers*

*Store directly to
memory card or disk*

*Display using analog-
quality digital persistence*



High speed and new firmware

The HP 70860A high speed controller board approximately doubles the speed of any RF, microwave, or millimeter modular spectrum analyzer that contains the HP 70900A local oscillator.

The HP 70860A also contains new firmware, available separately as the HP 70861A RAM/ROM upgrade kit. These kits upgrade your HP 70900A, providing the same firmware features as the HP 70900B, the master control module of the HP 70000C series modular spectrum analyzers.

HP 70860A high speed controller board upgrade kit

The HP 70860A uses the Motorola 68020 microprocessor and a 68881 floating point coprocessor operating at 20 MHz. (The previous rate was 10 MHz.)

Plugged into your HP 70900A, the HP 70860A is a powerful, high speed instrument controller. Processing speed is 1.5 to 3 times faster than before. Your upgraded system operates at 90% the speed of the HP 70900B local oscillator.

Local oscillator tuning speed, time between sweeps, sweep time, math functions, and internal processing are all improved.

High throughput measurements

Speed improvements, combined with the excellent accuracy and repeatability of the modular analyzer hardware, means higher throughput. You'll save time in your automatic tests.

Plus, the HP 70860A includes all the benefits of the HP 70861A.

HP 70861A RAM/ROM board upgrade kit

The HP 70861A contains new firmware loaded into high speed ROM. You can transfer data directly to a disk. Take full advantage of the HP 70004A color display by using memory cards, the hardkey panel and the analog-quality digital persistence display mode.

Memory card and external disks

The firmware allows the spectrum analyzer to read and write to external disks or to the memory card in the HP 70004A display. A computer is not required. You can save and recall

traces, states, downloadable programs (DLPs), and limit lines. Simply indicate the storage device desired: memory card, external disk, or internal memory (32 KB).

For a standard 1/4 MB ROM/RAM board, the user has access to more than 32 KB. It depends upon configuration, but normal configuration provides greater than 200 KB.

Option 512 for either kit extends the internal memory to 1 MB.

Digital persistence display

The firmware adds digital persistence to the HP 70004A color display. Extract information from complex modulated signals, such as TV, pulsed RF, and FM.

Digital persistence simulates the variable intensities of analog displays, without sacrificing the storage and plotting capabilities of digital displays.

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New speed commands

New commands speed up automated programs. The **OVERSWEEP** command allows auto-coupled sweep times up to five times faster with minimal amplitude degradation. The **FETCH** command transfers data over HP-IB simultaneously with transfer to the display.

Compatibility

Firmware is easily upgraded, regardless of which revision you currently have. The following table identifies which upgrade kit is required (HP 70860A, 70861A). You can install the upgrade yourself, or have it installed at any HP service center. Simply run the internal calibration (CAL ALL) after installation.

Module compatibility for firmware ROM version

The following information details each firmware version for the HP 70900A and 70900B local oscillator. This firmware contains the operating characteristics of the spectrum analyzers. The table shows which modules each firmware revision supports. After the initial version, new modules are indicated by *italics*. Firmware revisions are now documented using the version update fix (VUF) format (for example A.00.00). Both the VUF and datecode (for example 850730) are shown for all revisions in this list. The VUF format is available from the instrument via the front panel beginning with revision B.04.02. (See also the "IDN?" remote command.)

For each revision, the approximate available memory is indicated, along with information on major changes for the revision. Listed also is the product required to upgrade the firmware to the current revision. To determine your current revision, press the [MENU] hardkey, then <misc>, <service>, and <ROM VERSION> softkeys for later revisions, or press the [MENU] hardkey, then <CONFIG> and <ROM VERSION> softkeys for early revisions.

850320	Models
Datecode 850730 Revision A.00.00 <input type="checkbox"/> Usable RAM memory is 8K. <input type="checkbox"/> Upgrade: HP 70860A	70205A, 70206A, 70310A, 70900A, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B
Datecode 860203 Revision A.01.00 <input type="checkbox"/> Usable RAM memory is 8K. <input type="checkbox"/> Upgrade: HP 70860A	70205A, 70206A, 70300A , 70310A, 70900A, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A
Datecode 861015 Revision A.02.00 <i>Mem + intro</i> <input type="checkbox"/> Usable RAM memory is 16K. <input type="checkbox"/> Upgrade: HP 70860A	70205A, 70206A, 70300A, 70310A, 70600A, 70601A , 70900A, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A 70908A, H72
Datecode 870501 Revision A.03.00 <input type="checkbox"/> Usable RAM memory is 32K. <input type="checkbox"/> Upgrade: HP 70860A	70205A, 70206A, 70300A, 70310A, 70600A, 70601A, 70700A , 70900A, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70908A
Datecode 880314 Revision B.00.00 <i>Cheetah</i> <input type="checkbox"/> Usable RAM memory is 32K. <input type="checkbox"/> Upgrade: HP 70860A This revision introduced the new menu style, with firmkeys on the left.	70205A, 70206A, 70300A, 70310A, 70600A, 70601A, 70620A , 70700A, 70810A , 70900A, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70908A
Datecode 880901 Revision B.01.00 <i>Cheetah 2</i> <input type="checkbox"/> Usable RAM memory is 32K. <input type="checkbox"/> Upgrade: HP 70860A	70205A, 70206A, 70300A, 70301A , 70310A, 70600A, 70601A, 70620A, 70700A, 70810A, 70900A, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70908A

	Models
Datecode 890606 <i>Roadrunner</i> Revision B.02.00 <input type="checkbox"/> Usable RAM memory is 32K. <input type="checkbox"/> Upgrade: HP 70861A	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70700A, 70810A, 70900A, 70900B , 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70908A
Datecode 891102 <i>Road Runner</i> Revision B.02.01 <i>2</i> <input type="checkbox"/> Usable RAM memory is 32K. <input type="checkbox"/> Upgrade: HP 70861A	70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70700A, 70810A, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70908A
Datecode 900314 <i>Road runner 3</i> Revision B.03.00 <input type="checkbox"/> Usable RAM memory is 32K. <input type="checkbox"/> Upgrade: HP 70861A	70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A , 70700A, 70810A, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B , 70908A
Datecode 901008 <i>Star runner</i> Revision B.03.01 <input type="checkbox"/> Usable RAM memory is 128K, with 700K available as Option 512. <input type="checkbox"/> Upgrade: HP 70861A or HP 70861A Option 512. Able to support special personalities.	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A, 70700A, 70810A, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B, 70908A

60126(A)
~~60130~~
60130(B)

60148

~~60155~~
60156
~~60130~~

60160
60159

Can support SAB alternators

60114
60126

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HP 70860A/70861A

60171
60172

60176
60177

Models	
Datecode 910802 Reflection	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A , 70700A, 70810A, 70810B , 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B, 70908A, 70909A, 70910A
Revision B.04.00	
<input type="checkbox"/> Usable RAM memory is 128K, with 700K available as Option 512.	
<input type="checkbox"/> Upgrade: HP 70861A or HP 70861A-512 if desired.	
Programming compatibility with the HP 8566B is supported.	Many bugs
Datecode 911021 Reflection	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A, 70700A, 70810A, 70810B, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B, 70908A, 70909A, 70910A
Revision B.04.01	2
<input type="checkbox"/> Usable RAM memory is 128K, with 700K available as Option 512.	
<input type="checkbox"/> Upgrade: HP 70861A, or HP 70861A-512.	
Datecode 920325	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A, 70700A, 70810A, 70810B, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B, 70908A, 70909A, 70910A
Revision B.04.02 Reflection	
<input type="checkbox"/> Usable RAM memory is 128K, with 700K available as Option 512.	
<input type="checkbox"/> Upgrade: HP 70861A or HP 70861A-512.	
This revision is used in the HP 70950A and HP 70951A only.	

920527 B.04.03

Models	
Datecode 920724 Reflection	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A, 70700A, 70810A, 70810B, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B, 70908A, 70909A, 70910A
Revision B.04.04	III
<input type="checkbox"/> Usable RAM memory is 128K, with 700K available as Option 512.	
<input type="checkbox"/> Upgrade: HP 70861A, or HP 70861A-512.	
Datecode 940120 "HIGH FIVE"	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A, 70700A, 70810A, 70810B, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B, 70908A, 70909A, 70910A, 70911A
Revision B.05.00	
<input type="checkbox"/> Usable RAM memory is 128K, with 700K available as Option 512.	
<input type="checkbox"/> Upgrade: HP 70861A, or HP 70861A-512.	
Datecode 960418 XLERATOR	70004A, 70205A, 70206A, 70300A, 70301A, 70310A, 70600A, 70601A, 70620A, 70620B, 70621A, 70700A, 70810A, 70810B, 70900A, 70900B, 70902A, 70903A, 70904A, 70905A, 70905B, 70906A, 70906B, 70907A, 70907B, 70908A, 70909A, 70910A, 70911A
Revision B.06.03	
<input type="checkbox"/> Usable RAM memory is 128K, with 700K available as Option 512.	
<input type="checkbox"/> Upgrade: HP 70861A, or HP 70861A-512.	

60199

60203
60204

60209
60210

60216
60217

Ordering Information

HP 70860A high speed controller board upgrade kit

HP 70861A RAM/ROM board upgrade kit

Option 512 1 MB memory

Option 871 scalar personality

60111 MEM + Bd supports up to 60199 f/w bd

A → B
70900-60137

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Upgrade Kits

The HP 70900A/B local oscillator is the master control module for many different spectrum analyzer systems. These systems have compatibility requirements for firmware, hardware, and software. Requirements are listed below.

The latest local oscillator firmware will not work in the MEM Plus controller boards, which were used only in the HP 70900A. The part

numbers of these boards are 70900-60078, 70900-60081, and 70900-60111.

To determine the compatibility of a controller board, press the **Extended State** softkey. If the letters CPU are followed by the figure 68020, and if the letters FPU are followed by the word "Present," then the new firmware will work with the controller board.

Compatibility

To upgrade the LO firmware, order the HP 70861A. This kit includes a ROM/RAM board along with the latest documentation.

If the controller board needs to be upgraded, order the HP 70860A. This kit includes a controller board, ROM/RAM board, and the latest documentation.

HP 70900A firmware history

HP 70900A firmware version 850320 (initial release)

- HP 70900A serial numbers 2429A00101/2429A00265 (controller/ROM/RAM board, HP part number 70900-60078)

Additional modules supported

HP 70205A graphics display
HP 70206A system graphics display
HP 70310A precision frequency reference
HP 70902A IF section (resolution bandwidth 10 Hz to 300 kHz)
HP 70903A IF section (resolution bandwidth 100 kHz to 3 MHz)
HP 70904A RF section (100 kHz to 2.9 GHz)
HP 70905A RF section (50 kHz to 22 GHz)
HP 70905B RF section (50 kHz to 22 GHz)
HP 70906A RF section (50 kHz to 26.5 GHz)
HP 70906B RF section (50 kHz to 26.5 GHz)

HP 70900A firmware version 850730

- HP 70900A serial numbers 2534A00266/2544A00547 (ROMs only, HP part number 70900-60093; controller/ROM/RAM board, HP part number 70900-60078)

Additional modules supported

None

System diagnostics

HP part number 5010-1507 (3 ½ inch disk)
HP part number 5010-1508 (5 ¼ inch disk)

System operation verification

HP part number 70900-10037, rev. B.03.01 (3 ½ inch disk)
HP part number 70900-10038, rev. B.03.01 (5 ¼ inch disk)

HP 70900A firmware version 860203

- HP 70900A serial numbers 2606A00548/2629A01183 (ROMs only, HP part number 70900-60086; controller/ROM/RAM board, HP part number 70900-60078)

Additional modules supported

HP 70300A tracking generator
HP 70907A external mixer interface module

System diagnostics

HP part number 5010-1507 (3 ½ inch disk)
HP part number 5010-1508 (5 ¼ inch disk)

System operation verification

HP part number 70900-10037, rev. B.03.01 (3 ½ inch disk)
HP part number 70900-10038, rev. B.03.01 (5 ¼ inch disk)

HP 70900A firmware version 861015 (MEM Plus hardware)

- HP 70900A serial numbers 2642A01184/2646A01429 (ROM/RAM plug-in board, HP part number 70900-60083; controller board MEM +, HP part number 70900-60081)

Additional modules supported

HP 70590A H69 MATE test module adapter
HP 70600A preselector (50 kHz to 22 GHz)
HP 70601A preselector (50 kHz to 26.5 GHz)

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)

System operation verification

HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

HP 70900A firmware version 870501

- HP 70900A serial numbers 2717A01430/2812A01885 (ROM/RAM plug-in board, HP part number 70900-60109; controller board MEM +, HP part number 70900-60111)

Additional modules supported

HP 70700A digitizer
HP 70908A preselected RF section (100 Hz to 22 GHz)

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)

System operation verification

HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

HP 70900A firmware version 880314

- HP 70900A serial numbers 2817A01886/2833A02083 (ROM/RAM plug-in board, HP part number 70900-60114; controller board MEM +, HP part number 70900-60111)

Additional modules supported

HP 70620A preamplifier

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)
System operation verification
HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

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Compatibility

HP 70900A firmware version 880901

- HP 70900A serial numbers 2841A02084/3019A02763 (ROM/RAM plug-in board, HP part number 70900-60126; controller board MEM +, HP part number 70900-60111)

Additional modules supported

HP 70301A tracking generator (2.7 to 18 GHz)

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)

System operation verification

HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

HP 70900A/B firmware version 890606

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 2923A00101/2923A00389 (ROM/RAM board, HP part number 70900-60130; controller board, HP part number 70900-60082)

Additional modules supported

HP 70900B local oscillator

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)

System operation verification

HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

HP 70900A/B firmware version 891102

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 3001A00390/3002A00557 (ROM/RAM board, HP part number 70900-60148; controller board MEM ++, HP part number 70900-60143)

Additional modules supported

None

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)

System operation verification

HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

HP 70900A/B firmware version 900314

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 3022A00558/3022A00707 (ROM/RAM board, HP part number 70900-60156; controller board, HP part number 70900-60143)

Additional modules supported

HP 70621A preamplifier (100 kHz to 2.9 GHz)
HP 70620B preamplifier (1 to 26.5 GHz)
HP 70907B external mixer interface module

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)

System operation verification

HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

HP 70900A/B firmware version 901008

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 3041A00708/3127A01115 (ROM/RAM board 256 KB RAM, HP part number 70900-60160; ROM/RAM board 1 MB RAM, HP part number 70900-60159; controller board, HP part number 70900-60143)

Additional modules supported

None

System diagnostics

HP part number 70900-10050 (3 ½ inch disk)

System operation verification

HP part number 70900-10051, rev. C.01.00 (3 ½ inch disk)

HP 70900A/B firmware version 910802

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 3135A01116/3135A01183 (ROM/RAM assembly, 256 KB RAM, HP part number 70900-60171; ROM/RAM assembly, 1 MB RAM, HP part number 70900-60172; controller board, HP part number 70900-60143)

Additional modules supported

HP 70810B lightwave section

System diagnostics

HP part number 70900-10053 (3 ½ inch disk)

System operation verification

HP part number 70900-10052, rev. C.02.00 (3 ½ inch disk)

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HP 70900A/B firmware version 911021

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 3144A01184/3222A01427 (ROM/RAM assembly, 256 KB RAM, HP part number 70900-60176; ROM/RAM assembly, 1 MB RAM, HP part number 70900-60177; controller board, HP part number 70900-60143)

Additional modules supported

HP 70909A RF section (100 Hz to 26.5 GHz)
HP 70910A RF section (100 Hz to 26.5 GHz)

Additional systems supported

HP 71209A microwave spectrum analyzer (100 Hz to 26.5 GHz)

System diagnostics

HP part number 70900-10053 (3 ½ inch disk)

System operation verification

HP part number 70900-10052, rev. C.02.00 (3 ½ inch disk)

HP 70900A/B firmware version (VV.UU.FF) B.04.03 920527

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 3224A01428/3224A01469 (ROM/RAM assembly, 256 KB RAM, HP part number 70900-60195; ROM/RAM assembly, 1 MB RAM, HP part number 70900-60196; controller board, HP part number 70900-60143)

Additional modules supported

HP 70900B (A7) fractional frequency synthesizer

Additional systems supported

None

System diagnostics

HP part number 70900-10053 (3 ½ inch disk)

System operation verification

HP part number 70900-10052, rev. C.02.00 (3 ½ inch disk)

HP 70900A/B firmware version (VV.UU.FF) B.04.04 920724

- HP 70900A serial numbers above prefix 3019A
- HP 70900B serial numbers 3232A01470/3345A01967 (ROM/RAM assembly, 256 KB RAM, HP part number 70900-60199; ROM/RAM assembly, 1 MB RAM, HP part number 70900-60200; controller board, HP part number 70900-60143)

Additional modules supported

None

Additional systems supported

None; system error corrected

System diagnostics

HP part number 70900-10056, rev. D.01.00 (3 ½ inch disk)

System operation verification

HP part number 70900-10055, rev. D.01.00 (3 ½ inch disk)
HP 1990A system performance test software, rev. D.01.00

Option 001 user interface 1990-10077

Option 100 HP 7100011990-10078

Option 200 HP 71200/712011990-10079

Option 209 HP 7120911990-10081

Option 210 HP 7121011990-10080

Option 300 HP 7130011990-10082

Option 033 HP 70300/7030111990-10083

Compatibility

HP 70900A/B firmware version (VV.UU.FF) B.05.00 940120

- HP 70900A serial numbers above prefix 3019A
Note: Must have a 70900-60143 controller board or later.
- HP 70900B serial numbers 3414A01968 to present (ROM/RAM assembly, 256 KB RAM, HP part number 70900-60203; ROM/RAM assembly, 1 MB RAM, HP part number 70900-60204; controller board, HP part number 70900-60143)

Additional modules supported

HP 70911A IF module

Additional systems supported

HP 71910A receiver system

HP 70900A/B firmware version (VV.UU.FF) B.06.03 960418

- HP 70900A serial numbers above prefix 3019A
Note: Must have a 70900-60143 controller board or later.
- HP 70900B serial numbers 3414A01968 to present (ROM/RAM assembly, 256 KB RAM, HP part number 70800-60209; ROM/RAM Opt. 512 assembly, 1 MB RAM, HP part number 70900-60210; controller board, HP part number 70900-60213)

Additional modules supported

HP 70911A IF module

Additional systems supported

HP 71910A receiver system