User's Guide

HP 11951A Option 12D Spectrum Analyzer Infrared Controller

HP part number: 11951-90004
Printed in USA May 1992

Certification

Hewlett-Packard Company certifies that this product met its published specifications at the time of shipment from the factory. Hewlett-Packard further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

Regulatory Information.

Chapter 1 contains regulatory information.

Warranty

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by Hewlett-Packard. Buyer shall prepay shipping charges to Hewlett-Packard and Hewlett-Packard shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to Hewlett-Packard from another country.

Hewlett-Packard warrants that its software and firmware designated by Hewlett-Packard for use with an instrument will execute its programming instructions when properly installed on that instrument. Hewlett-Packard does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error-free.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. HEWLETT-PACKARD SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Exclusive Remedies

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. HEWLETT-PACKARD SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

Assistance

Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard products.

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office.

Safety Symbols

The following safety symbols are used throughout this manual. Familiarize yourself with each of the symbols and its meaning before operating this instrument.

CAUTION

The *caution* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a *caution* sign until the indicated conditions are fully understood and met.

WARNING

The *warning* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a *warning* sign until the indicated conditions are fully understood and met.

General Safety Considerations

WARNING

Before this instrument is switched on, make sure it has been properly grounded through the protective conductor of the ac power cable to a socket outlet provided with protective earth contact.

Any interruption of the protective (grounding) conductor, inside or outside the instrument, or disconnection of the protective earth terminal can result in personal injury.

WARNING

There are many points in the instrument which can, if contacted, cause personal injury. Be extremely careful.

Any adjustments or service procedures that require operation of the instrument with protective covers removed should be performed only by trained service personnel.

CAUTION

Before this instrument is switched on, make sure its primary power circuitry has been adapted to the voltage of the ac power source.

Failure to set the ac power input to the correct voltage could cause damage to the instrument when the ac power cable is plugged in.

In This Book . . .

Chapter 1	introduces the HP 11951A Option 12D spectrum analyzer infrared controller.
Chapter 2	discusses installing the HP 11951A Option 12D spectrum analyzer infrared controller, batteries, and optional keyboard.
Chapter 3	outlines several tasks designed to help you begin using the HP 11951A Option 12D spectrum analyzer infrared controller as quickly as possible.
Chapter 4	describes, in alphabetical order, each of the HP 11951A Option 12D spectrum analyzer infrared controller's transmitter keys.

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1

Introducing the Infrared Controller

Introducing the Infrared Controller

This chapter introduces the HP 11951A Option 12D spectrum analyzer infrared controller. This chapter contains the following information:

Start Here

If You Are Familiar with the Infrared Controller

Read this chapter, then use the manual as a reference.

If You Are Unfamiliar with the Infrared Controller

Read this chapter, then read the following chapters, which outline several tasks to help you to learn more about the infrared controller.

- Infrared controller installation ..... Chapter 2
- Measuring a signal's amplitude ..... Chapter 3
- Radiated EMI evaluations using an infrared controller ..... Chapter 3
- Reprogramming the infrared controller ..... Chapter 3

Manual Terms and Conventions

(Key)	A boxed name in this typeface represents a key physically located on the instrument.
Softkey	A boxed name in this typeface represents a "softkey," a key whose label is determined by the instrument's firmware.
DISPLAY	Text printed in this typeface represents text displayed on the display.

Introducing the Infrared Controller

The HP 11951A Option 12D spectrum analyzer infrared controller adds the ability to setup and make spectrum analyzer based measurements from a hand-held remote control transmitter. Option 12D focuses on making EMC measurements using the HP 85712D EMC auto-measurement personality. Non-EMC applications will also benefit by being able to control many of the fundamental instrument functions from a distance. The hand-held transmitter controls 60 separate functions; 48 are basic spectrum analyzer functions and 12 are the HP 85712D EMC auto-measurement personality functions that require the personality to be installed in an HP 8590 series spectrum analyzer. The infrared receiver connects directly to the analyzer's EXT KEYBOARD input. A keyboard can also be "daisy-chained" with the infrared receiver.

CAUTION

The HP 85712D EMC auto-measurement personality requires a spectrum analyzer firmware version 26.10.90 or higher.

NOTE

The HP 11951A Option 12D spectrum analyzer infrared controller's transmitter can operate at a distance of 30 feet from the infrared controller's receiver when fresh batteries are installed.

The HP 11951A Option 12D can be installed in any of the following Hewlett-Packard spectrum analyzers:

- HP 8591E
- HP 8593E
- HP 8594E
- HP 8595E
- HP 8596E
- HP 8591A
- HP 8593A
- HP 8594A
- HP 8595A

NOTE

To install the infrared controller, all spectrum analyzers must be configured with Options 021 (HP-IB Interface) or Option 023 (RS-232 Interface).

CAUTION

If you are using the HP 85712D auto-measurement personality with the HP 11951A Option 12D spectrum analyzer infrared controller, it is important to initialize the personality. To initialize the EMC measurement personality, use the personality's `EMC Config`, `EMC Manual`, or `EMC Automatn` front-panel softkeys.

What You Receive with the Infrared Controller

① Users Guide

② Two AA Alkaline Batteries

③ DOS key map program disk, 3 1/2 inch

④ Infrared transmitter

⑤ Infrared receiver

⑦ Cable Set

Infrared receiver to spectrum analyzer cable
Infrared receiver to optional keyboard cable
Infrared receiver to computer cable with ⑥ adapter

Options

- Keyboard
- Monitor

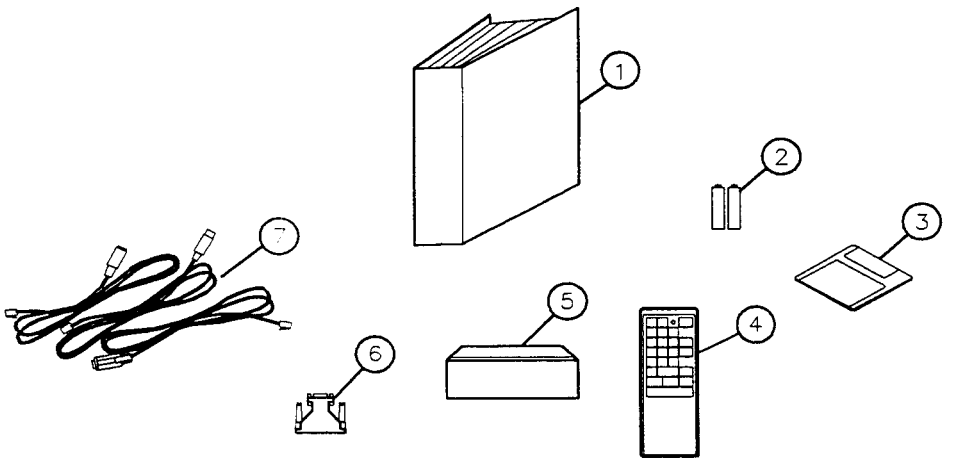


Figure 1-1. Equipment Received with Infrared Controller

Getting Acquainted with the Infrared Controller Transmitter Unit

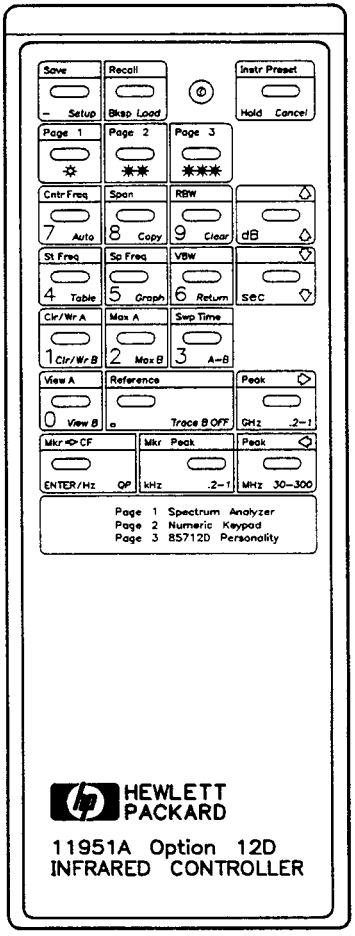
For a description of the infrared control features shown in Figure 1-2, refer to "Chapter 4, Dictionary Reference." For an introduction to the basic measurements using the infrared controller, refer to "Chapter 3, Task Reference." For more information about your spectrum analyzer, refer to your spectrum analyzer's user documentation.

Each transmitter key accesses three pages (menus).

Page 1	basic spectrum analyzer functions
Page 2	numeric keypad and terminators
Page 3	HP 85712D EMC auto-measurement personality keys, trace B control, and the copy key

Press the page you want, then press the appropriate function key. The functions for page 1 are shown in the shaded area at the top of the key. Page 2 (numeric pad) functions are shown in the bottom left of each key, and page 3 functions are shown in the bottom right of each key.

Visual feedback is provided on the front of the infrared controller's receiver unit. When one red light is lit, the receiver is responding to page 1 commands. When two and three lights are lit, the receiver is responding to pages 2 or 3 respectively.



pj31a

Figure 1-2. Transmitter Feature Overview

Sales and Service Information

To obtain servicing information, or to order replacement parts, contact the nearest Hewlett-Packard Sales and Service Office listed in Table 1-1.

Replacement Parts

- Infrared transmitter 11951-60001
- Infrared receiver PC board, programmed 11951-60002
- Cable Set 11951-90001
  - ☐ Infrared receiver to spectrum analyzer cable
  - ☐ Infrared receiver to optional keyboard cable
  - ☐ Infrared receiver to computer cable (with adapter)
- AA Alkaline Batteries 1420-0058
- 3 1/2 inch DOS key may program disk 11951-10002
- Users Guide 11951-90004

Available Options

- Keyboard ..... HP C1405A
- Monitor ..... HP 11952A

Table 1-1. Hewlett-Packard Sales and Service Offices

US FIELD OPERATIONS

Headquarters
Hewlett-Packard Company
19320 Pruneridge Avenue
Cupertino, CA 95014, USA
(800) 752-0900

California, Northern
Hewlett-Packard Co.
301 E. Evelyn
Mountain View, CA 94041
(415) 694-2000

California, Southern
Hewlett-Packard Co.
1421 South Manhattan Ave.
Fullerton, CA 92631
(714) 999-6700

Colorado
Hewlett-Packard Co.
24 Inverness Place, East
Englewood, CO 80112
(303) 649-5000

Georgia
Hewlett-Packard Co.
2000 South Park Place
Atlanta, GA 30339
(404) 955-1500

Illinois
Hewlett-Packard Co.
5201 Tollview Drive
Rolling Meadows, IL 60008
(708) 255-9800

New Jersey
Hewlett-Packard Co.
120 W. Century Road
Paramus, NJ 07653
(201) 599-5000

Texas
Hewlett-Packard Co.
930 E. Campbell Rd.
Richardson, TX 75081
(214) 231-6101

EUROPEAN FIELD OPERATIONS

Headquarters
Hewlett-Packard S.A.
150, Route du Nant-d'Avril
1217 Meyrin 2/Geneva
Switzerland
(41 22) 780.8111

France
Hewlett-Packard France
1 Avenue Du Canada
Zone D'Activite De Courtaboeuf
F-91947 Les Ulis Cedex
France
(33 1) 69 82 60 60

Germany
Hewlett-Packard GmbH
Berner Strasse 117
6000 Frankfurt 56
West Germany
(49 69) 500006-0

Great Britain
Hewlett-Packard Ltd.
Eskdale Road, Winnersh Triangle
Wokingham, Berkshire RF11 5DZ
England
(44 734) 696622

INTERCON FIELD OPERATIONS

Headquarters
Hewlett-Packard Company
3495 Deer Creek Rd.
Palo Alto, California 94304-1316
(415) 857-5027

Australia
Hewlett-Packard Australia Ltd.
31-41 Joseph Street
Blackburn, Victoria 3130
(61 3) 895-2895

Canada
Hewlett-Packard (Canada) Ltd.
17500 South Service Road
Trans- Canada Highway
Kirkland, Quebec H9J 2X8
Canada
(514) 697-4232

China
China Hewlett-Packard Company
38 Bei San Huan X1 Road
Shuang Yu Shu
Hai Dian District
Beijing, China
(86 1) 256-6888

Japan
Yokogawa-Hewlett-Packard Ltd.
1-27-15 Yabe, Sagamihara
Kanagawa 229, Japan
(81 427) 59-1311

Singapore
Hewlett-Packard Singapore (Pte.) Ltd
1150 Depot Road
Singapore 0410
(65) 273-7388

Taiwan
Hewlett-Packard Taiwan
8th Floor, H-P Building
337 Fu Hsing North Road
Taipei, Taiwan
(886 2) 712-0404

Declaration of Conformity

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Hewlett-Packard Co.
Manufacturer's Address:	1212 Valley House Drive Rohnert Park, California 94928-4999 U.S.A.

Declares that the product:

Product Name:	Spectrum Analyzer Infrared Controller
Model Numbers:	HP 11951A Option 12D
Product Options:	This declaration covers all options of the above products.

Conforms to the following product specifications:

Safety:	IEC 348(1978) / HD 401 S1
EMC:	EN 55011 / CISPR 11(1990) Group 1, Class A EN 50082-1(1992) IEC 801-2(1991), 8 kV AD IEC 801-3(1984), 3 V/m IEC 801-4(1988), 500 V signal, 1 kV ac power

Supplementary Information:

Rohnert Park, California — **Location**

6/1/92 — **Date**

Dixon Browder / QA Manager

Electrostatic Discharge Performance

When an IEC 801-3, Electrostatic Discharge Test, is performed with an air discharge of 8 kV to the HP 11951A Option 12D, the analyzer will occasionally "lock up" in the current state. The analyzer can be brought back to an operating state by pressing the green (PRESET) key on the spectrum analyzer.

Electrostatic Discharge Performance

2

Installing the Infrared Controller

Installing the Infrared Controller

This chapter discusses installing the HP 11951D Option 12D spectrum analyzer infrared controller, batteries, and optional keyboard and includes the following information:

Installing the Infrared Controller's Transmitter Batteries

The following procedure describes how to install or replace the infrared controller's transmitter batteries.

Install the batteries prior to using the infrared controller's transmitter unit.

1. Turn the transmitter unit upside down.
2. Open the battery cover by pushing on the cover. Note the direction of the arrow (△) on the battery cover. See Figure 2-1.

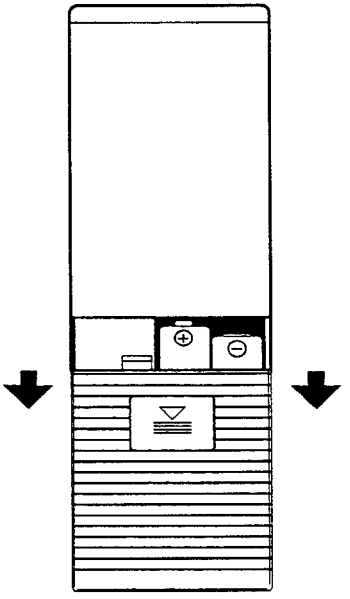


Figure 2-1. Installing the Infrared Controller's Transmitter Batteries

3. Install or replace the batteries. Note the orientation of the batteries as shown in the battery compartment.
4. Replace the battery cover.

Installing the Infrared Controller Receiver Unit

The following procedure describes how to connect the infrared controller's receiver unit to the spectrum analyzer.

1. Connect the receiver's rear-panel TO SPECTRUM ANALYZER (black connector) output connector to the spectrum analyzer's rear-panel EXT KEYBOARD (lower-left corner) input connector. See Figure 2-2. Match the cable's color to the connector's color.

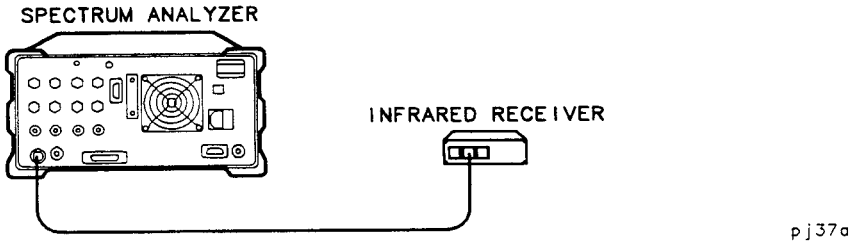


Figure 2-2. Installing the Infrared Controller's Receiver

2. Turn the spectrum analyzer's power on.
3. Press the spectrum analyzer's green (PRESET) front-panel key.

CAUTION

The spectrum analyzer's (PRESET) front-panel key must be pressed after turning on the spectrum analyzer's power. Otherwise, the spectrum analyzer may not recognize the infrared controller's presence.

4. Test the receiver's functionality by pressing the (Page 1) and (Instr Preset) transmitter keys. If the infrared controller unit and spectrum analyzer are functioning correctly the spectrum analyzer will perform an instrument preset.

Installing the Optional Keyboard

The following procedure describes how to connect the optional keyboard to the infrared controller's receiver unit.

1. Connect the keyboard's output cable to the receiver's rear-panel TO KEYBOARD (blue connector) input connector. See Figure 2-3. Match the cable's color to the connector's color.

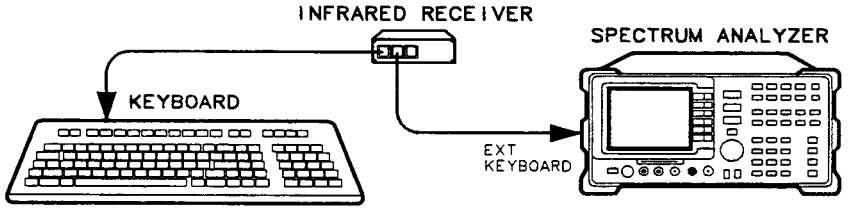


Figure 2-3. Installing the Optional Keyboard

3

Making Measurements Using the Infrared Controller

Making Measurements Using the Infrared Controller

This chapter describes a series of measurements using the infrared controller and the EMC auto-measurement personality and includes the following information:

Making a Manual Radiated Measurement

The objectives of this test are to find the highest emissions from the device under test (DUT).

Helpful Information

The trace information on the display screen presented in this procedure are representative examples only. They may not reflect what you see on your display.

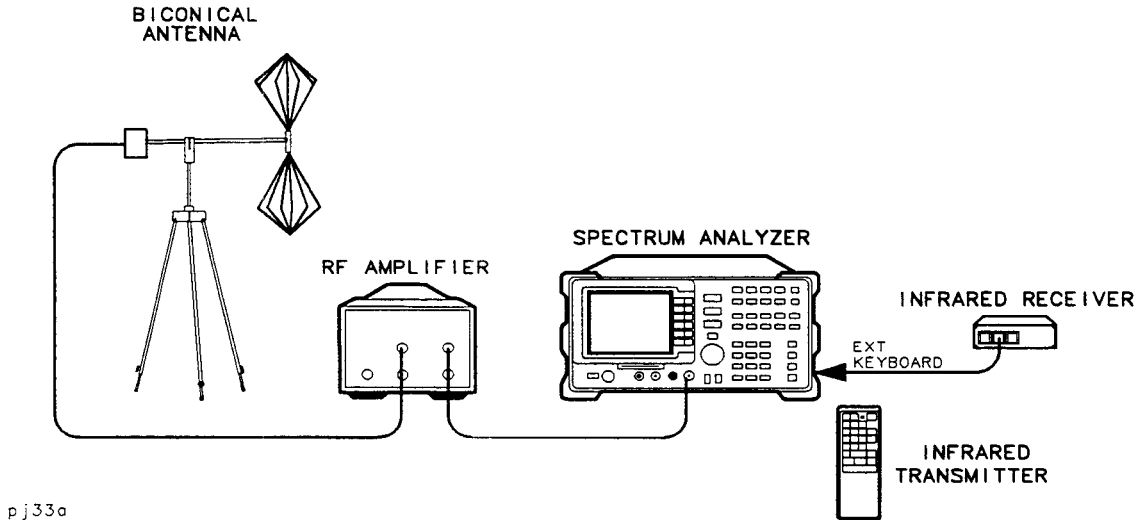


Figure 3-1. Manual Radiated EMI Measurements Test Setup

Equipment List

Spectrum Analyzer	HP 8591E Option 021 or 023
	HP 8593E Option 021 or 023
	HP 8594E Option 021 or 023
	HP 8595E Option 021 or 023
	HP 8596E Option 021 or 023
	HP 8591A Option 021 or 023
	HP 8593A Option 021 or 023
	HP 8594A Option 021 or 023
	HP 8595A Option 021 or 023
Infrared Controller	HP 11951A Option 12D
EMC Measurement Personality Card	HP 85712D
Preamplifier	HP 8447F Option H64
Biconical Antenna	HP 11966C
Antenna Tripod	HP 11968C
Printer	ThinkJet

Measuring the Amplitude of a Signal

Setting the Frequency Range

The following procedure describes using the infrared controller to set the analyzer's frequency range.

1. Press the [Page 1] key on the HP 11951A Option 12D spectrum analyzer infrared controller transmitter.
2. Press the [PRESET] transmitter key to reset the analyzer.
3. Press the [St Freq] transmitter key.
4. Press the [Page 2] transmitter key.
5. Press the [1], [2], [0], and [MHz] transmitter keys to set the start frequency to 120 MHz.
6. Press the [Page 1] transmitter key.
7. Press the [Sp Freq] transmitter key.
8. Press the [Page 2] transmitter key.
9. Press the [3], [0], [0], and [MHz] transmitter keys to set the stop frequency to 300 MHz. See Figure 3-2.

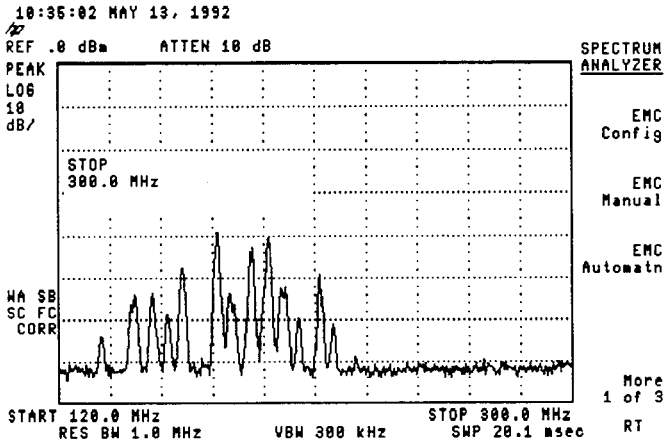


Figure 3-2. Frequency Range Set

Setting the Bandwidths and Reference Level

The following procedure describes using the infrared controller to set the analyzer's bandwidths and reference level.

10. Press the [Page 1] transmitter key.
11. Press the [RBW] transmitter key.
12. Press the [Page 2] transmitter key.
13. Press the [1], [2], [0], and [kHz] transmitter keys to set the resolution bandwidth to 120 kHz.
14. Press the [Page 1] transmitter key.
15. Press the [VBW] transmitter key.
16. Press the [Page 2] transmitter key.
17. Press the [1] and [MHz] transmitter keys to set the video bandwidth to 1 MHz. See Figure 3-3.

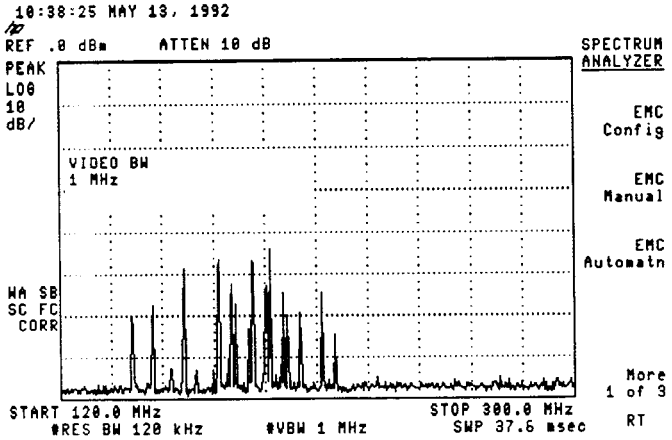


Figure 3-3. Bandwidths Set

18. Press the (Page 1) transmitter key.
19. Press the (Reference) transmitter key.
20. Press the (⇩) transmitter key twice to set the reference level. See Figure 3-4.

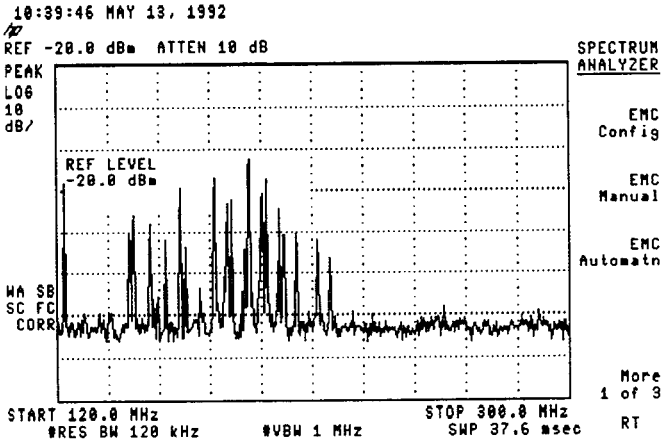


Figure 3-4. Reference Level Set

Saving the State for Later Recall

The following procedure describes using the infrared controller to save the state for later recall.

21. Press the [Save] transmitter key.
22. Press the [Page 2] transmitter key.
23. Press the [3] transmitter key.
24. Press the [ENTER/Hz] transmitter key to save the state in register 3.

To recall the state from register:

25. Press the [Page 1] transmitter key.
26. Press the [Recall] transmitter key.
27. Press the [Page 2] transmitter key.
28. Press the [3] transmitter key.
29. Press the [ENTER/Hz] transmitter key to recall the state in register 3.

Selecting the Signal to Measure

The following procedure describes using the infrared controller to select the signal to measure.

30. Press the (Page 1) transmitter key.
31. Press the (Mkr Peak) transmitter key.
32. Press either the (MKR⇒) or (MKR⇐) multiple times until the signal of interest is marked. See Figure 3-5.

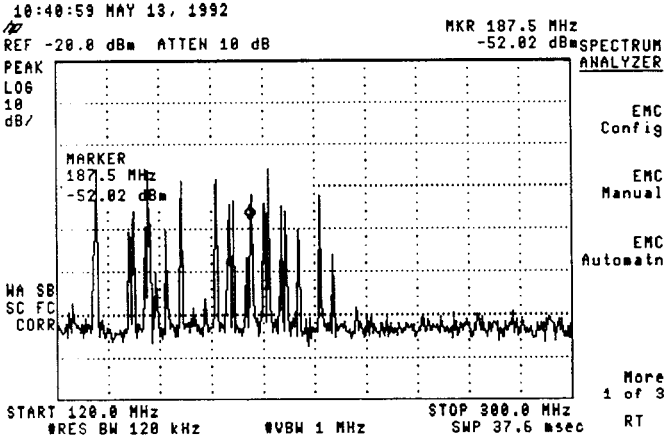


Figure 3-5. Marker on Signal of Interest

33. Press the (Mkr⇒CF) transmitter key to center the marker on the display.
34. Press the (Span) transmitter Key.
35. Press the (⇩) transmitter Key multiple times until the signal of interest is isolated.

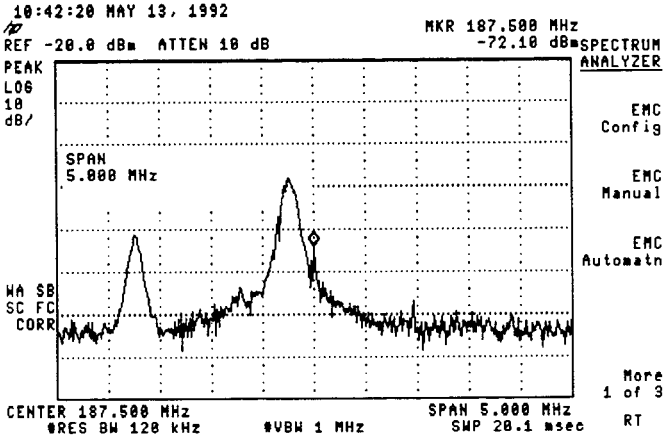


Figure 3-6. Signal of Interest Isolated on Screen

Measuring the Peak Amplitude and Quasi-Peak Amplitude

The following procedure describes using the infrared controller to measure the peak amplitude and optionally, if the HP 85712D auto-measurement personality is installed, the quasi-peak amplitude.

NOTE

The HP 85712D EMC auto-measurement personality must be installed in the spectrum analyzer before performing the quasi-peak measurement. Refer to the *HP 85712D EMC Auto-Measurement Personality Users Guide* for more information about installing the EMC measurement personality.

36. Press the (Mkr Peak) transmitter key, being sure the signal of interest is marked.
37. Press the (Max A) transmitter Key.

38. Adjust the cables and device under test operating mode until the on-screen signal is maximized.
39. Record the peak signal amplitude from the marker readout in the upper-right corner of the display (for example, Figure 3-7 shows −45.69 dBm) for later reference.

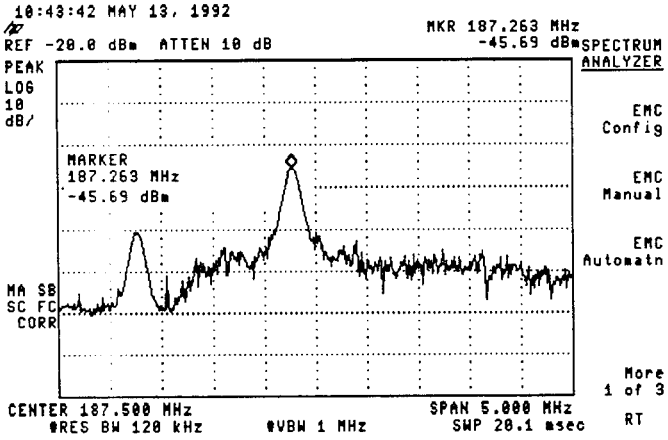


Figure 3-7. Signal Maximized

Measuring the Quasi-Peak Amplitude.

NOTE

A reminder that the HP 85712D EMC auto-measurement personality must be installed in the spectrum analyzer before performing the quasi-peak measurement.

40. Press the (Page 3) transmitter key.

41. Press the (QP) transmitter key to initiate the quasi-peak measurement.
42. Record the quasi-peak signal amplitude from the field strength readout at the bottom of the display. The value shown in Figure 3-8 is 61.99 dBμV.

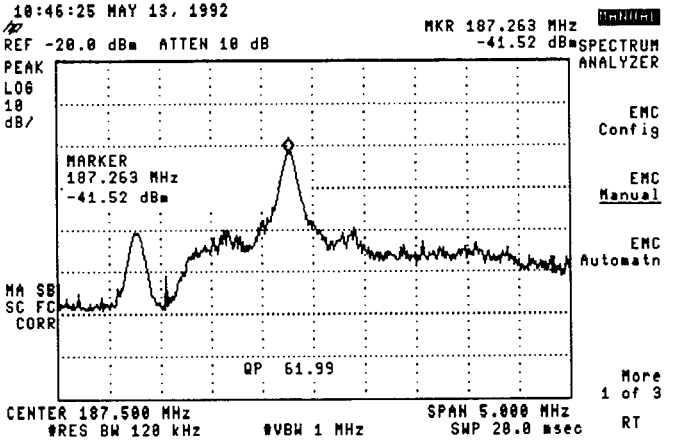


Figure 3-8. Quasi-Peak Measurement

Printing or Plotting the Results

NOTE

The printer or plotter must be already have been specified using the spectrum analyzer's (CONFIG) key and either the PLOT CONFIG (for plotter) or the PRINT CONFIG softkeys.

43. Press the (Copy) transmitter key to copy the graph to a printer (or plotter).
44. Press the (Return) transmitter key to return to the normal spectrum analyzer display.

45. Press (Page 1), then (Preset), to preset the spectrum analyzer.

NOTE

Multiples signal can be measured by repeating the "Making a Manual Radiated Measurement" procedure.

Making an Automated Radiated Measurement

The objectives of this test are to find the highest emissions from the device under test (DUT) and to compare those emissions to known limits.

Helpful Information

The trace information on the display screen presented in this procedure are representative examples only. They may not reflect what you see on your display.

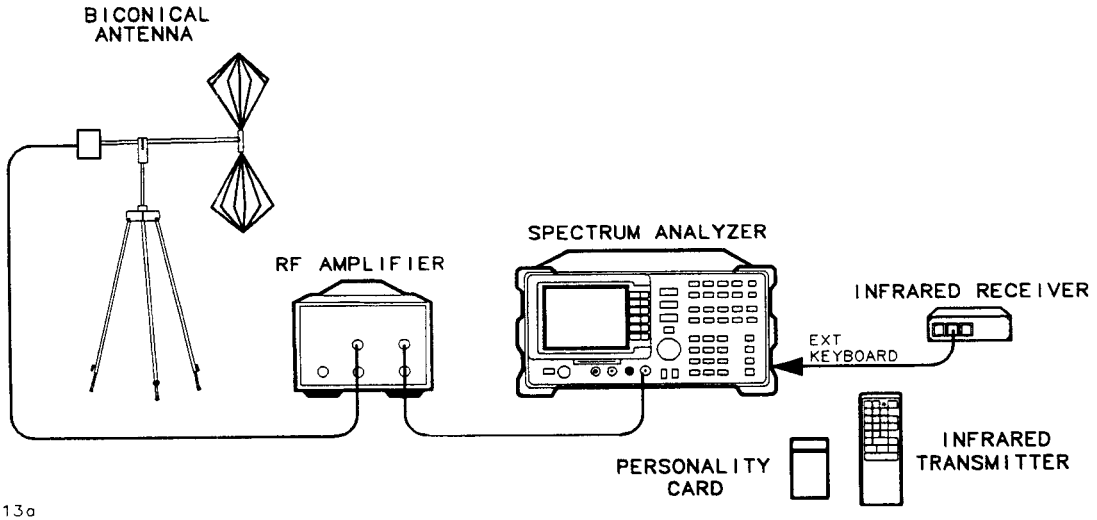


Figure 3-9. Automated Radiated EMI Measurements Test Setup

Equipment List

Spectrum Analyzer	HP 8591E Option 021 or 023
	HP 8593E Option 021 or 023
	HP 8594E Option 021 or 023
	HP 8595E Option 021 or 023
	HP 8596E Option 021 or 023
	HP 8591A Option 021 or 023
	HP 8593A Option 021 or 023
	HP 8594A Option 021 or 023
	HP 8595A Option 021 or 023
Infrared Controller	HP 11951A Option 12D
EMC Measurement Personality Card	HP 85712D
Preamplifier	HP 8447F Option H64
Biconical Antenna	HP 11966C
Antenna Tripod	HP 11968C
Printer	ThinkJet

Configuring the Analyzer for Testing

NOTE

The HP 85712D EMC auto-measurement personality must be installed in the spectrum analyzer before attempting this procedure. Refer to the *HP 85712D EMC Auto-Measurement Personality Users Guide* for more information about installing the EMC measurement personality.

The following procedure describes loading a sample radiated emissions setup (SAMPLE R) into the spectrum analyzer.

1. Press the (Page 1) key on the HP 11951A Option 12D spectrum analyzer infrared controller transmitter.
2. Press the (PRESET) transmitter key to reset the analyzer.
3. Press the (Page 3) transmitter key.
4. Press the (Setup) transmitter key.
5. Use the (⇩) step key to move the cursor to highlight SAMPLE R . See Figure 3-10.

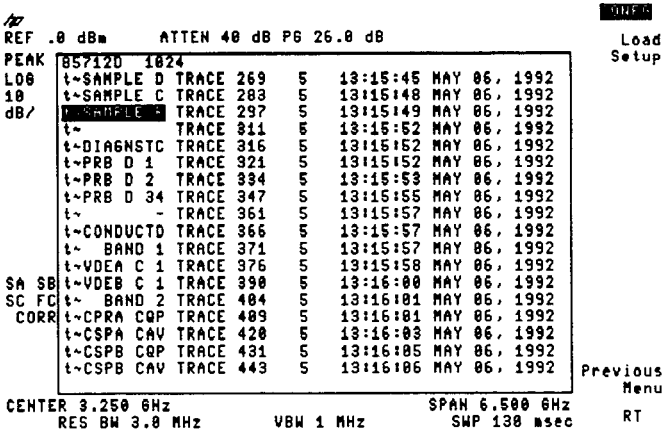


Figure 3-10. SAMPLE R Selected

6. Press the (Load) transmitter key, which loads the proper frequency range, bandwidths, limit lines, transducer factors, preamp gain, and attenuation into the spectrum analyzer. See Figure 3-11.

NOTE

If you wish to cancel instead of loading the setup, press the (Cancel) transmitter key.

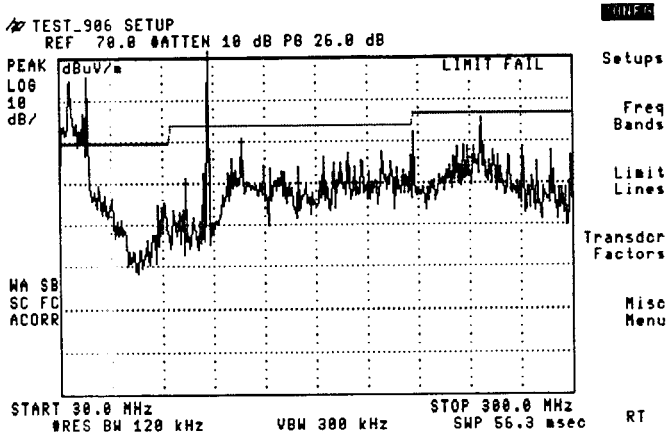


Figure 3-11. SAMPLE R **Loaded into the Analyzer**

Changing the Frequency to Avoid the FM Band

NOTE

When performing radiated measurements, high ambient signals may be observed in the 88 to 108 MHz range due to commercial FM broadcasting. The frequency Range may be modified to move these signals off screen.

7. Press the [Page 1] transmitter key.
8. Press the [St Freq] transmitter key.
9. Press the [Page 2], [1] [2] [0], [MHz] transmitter keys. See Figure 3-12.

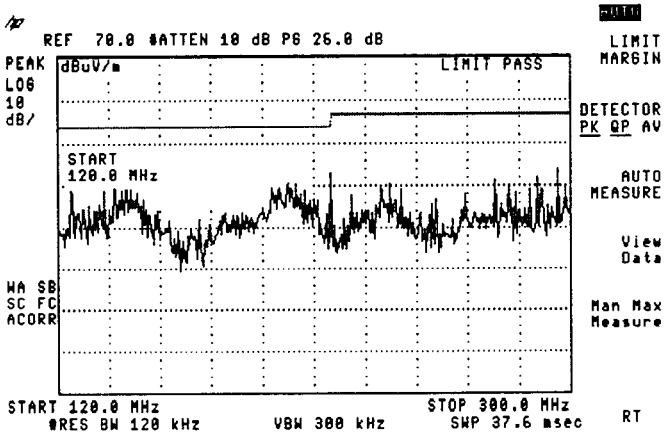


Figure 3-12. Selecting a Start Frequency of 120 MHz

Making an Ambient Signal List

10. Turn the DUT off.
11. Press the (Page 3) transmitter key.
12. Press the (Auto) transmitter key to start the scan sequence and view the results. See Figure 3-13.

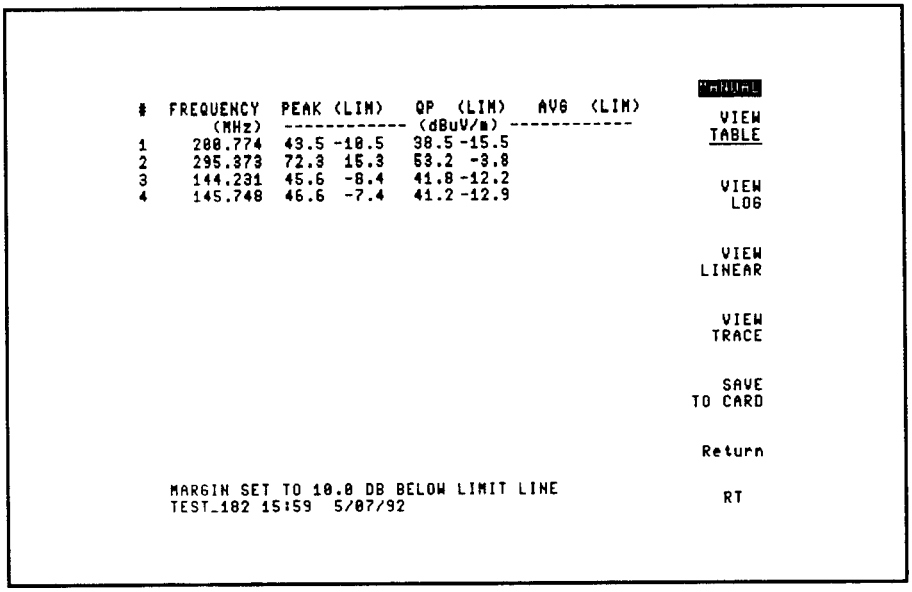


Figure 3-13. Viewing the Data in Tabular Form

13. Press the [COPY] transmitter key to copy the data table to a printer (or plotter).
14. Turn DUT on.
15. Press the [MAX B] transmitter key to allow maximization of signals. Adjust the DUT's operating mode or adjust its cable position until the worst-case emissions appear on screen. See Figure 3-14.

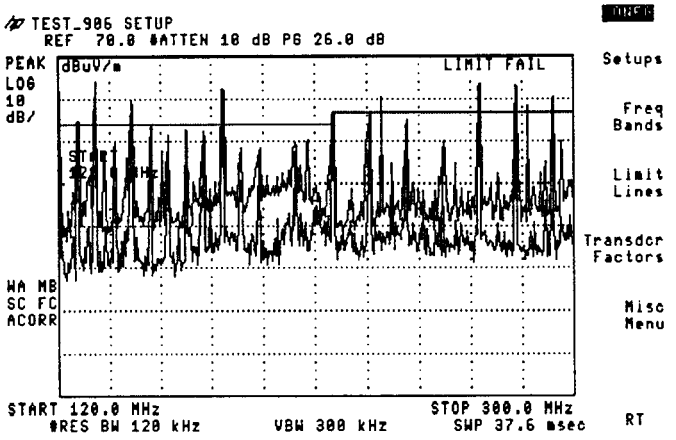


Figure 3-14. Maximization of Signals

Invoking Quasi-Peak Detection

16. Press the (Auto) transmitter key to start the scan sequence and view the results.

Measured frequencies, including peak and quasi-peak measurements will be listed, along with the delta value that exceeds (or does not exceed) the limit line. See Figure 3-15.

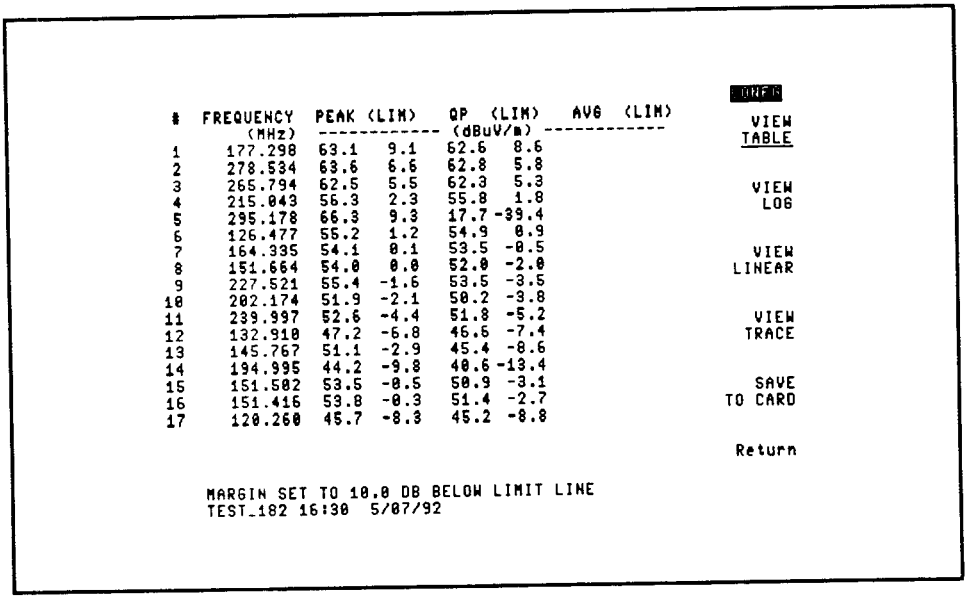


Figure 3-15. Viewing the Data in Tabular Form

NOTE

Some ambients are intermittent and may not show up on a data scan, but may appear on the ambient list.

17. Press the (Graph) transmitter key to view the data on a logarithmic scale. The cross mark (+) represents the quasi-peak value. See Figure 3-16.

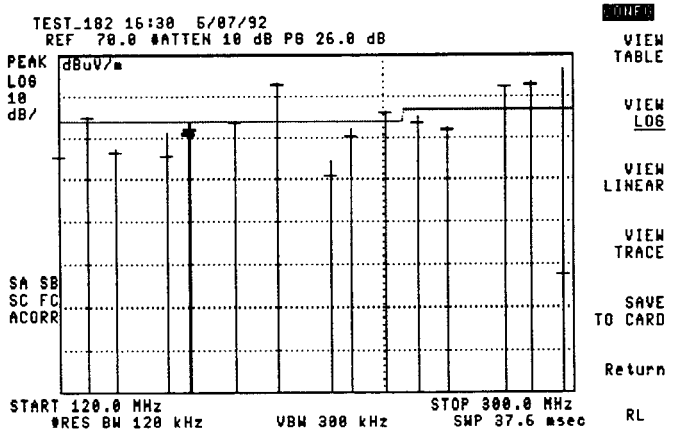


Figure 3-16. Viewing the Graphed Data

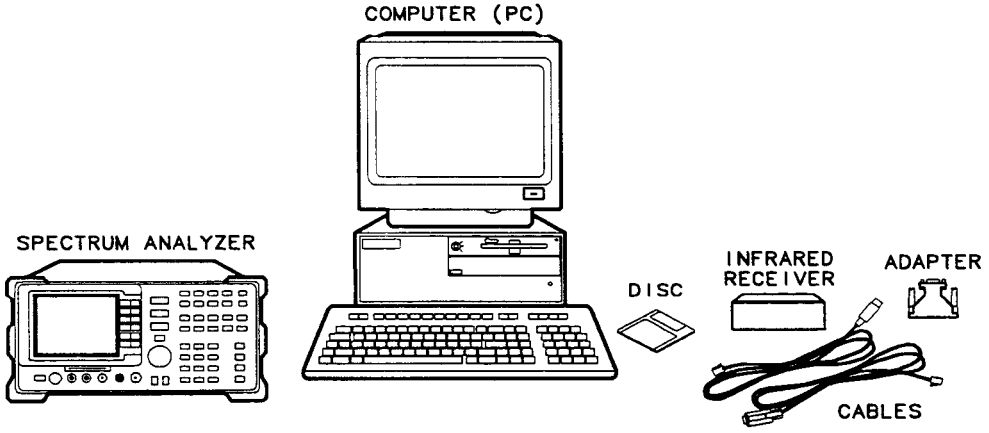
18. Press the (Copy) transmitter key to copy the graph to a printer (or plotter).
19. Press the (Return) transmitter key to return to the normal spectrum analyzer display.
20. Press (Page 1), then (Preset), to preset the spectrum analyzer.

The signals appearing on the ambient list (see Figure 3-13) can generally be disregarded if they also appear on the list of DUT signals (see Figure 3-15). Signals generated by the DUT that are close to or above the limit line will require EMI suppression. Use the DUT signal list to manually check the effectiveness of the suppression techniques.

Reprogramming the Infrared Controller's Receiver

The following procedure describes how to use a PC to reprogram the infrared controller's receiver unit.

Setting Up the Equipment for Reprogramming



pj34a

Figure 3-17. Required Equipment

Equipment List

Computer (PC) ..... AT Compatible
Spectrum Analyzers ..... HP 8590E Series Option 021 or 023
HP 8590A Series Option 021 or 023
Infrared Controller Receiver Unit ..... HP 11951A Option 12D
Interconnect cables
Disc

Reprogramming the Infrared Controller's Receiver

The objective of this procedure is to use a computer to reprogram the infrared controller's receiver. This procedure requires a personal computer with MS-DOS 4.0* or later installed.

* MS-DOS[tm] is a registered trademark of Microsoft Corporation.

NOTE

Reprogramming is only necessary if there has been a loss of the infrared receiver's non-volatile memory.

Supplying +5 Volts to the Receiver

1. In order to supply +5 Volts to the receiver, do one of the following:
   a. Connect the infrared receiver's rear-panel TO SPECTRUM ANALYZER (black connector) output connector to the spectrum analyzer's

rear-panel EXT KEYBOARD (lower-left corner) input connector. See Figure 3-18. Match the cable's color to the connector's color.

b. Connect the infrared receiver's rear-panel TO SPECTRUM ANALYZER (black connector) output connector to the computer's keyboard connector. Connect the computer keyboard to the infrared controller's rear-panel KEYBOARD (blue connector) input connector. See Figure 3-19. Match the cable's color to the connector's color.

2. Perform a [PRESET] on the spectrum analyzer.

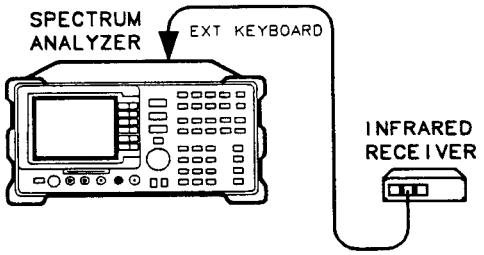


Figure 3-18. Connecting the Infrared Receiver to a Spectrum Analyzer

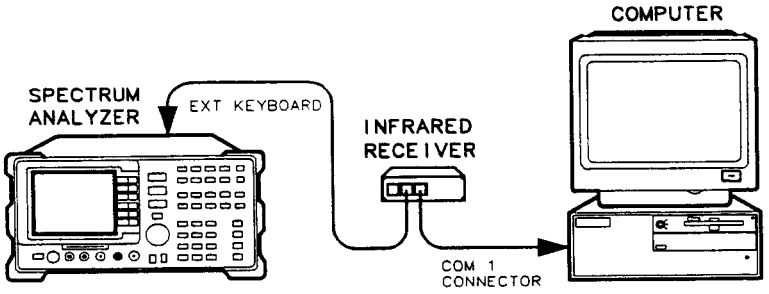


Figure 3-19. Connecting the Infrared Receiver to a Personal Computer

Connecting the Infrared Controller's Receiver to a Computer

The following procedure describes how to connect the infrared controller's receiver unit to the computer.

3. Connect the receiver's rear-panel TO PERSONAL COMPUTER (yellow connector) connector to the computer's serial (COM 1) input/output connector. Use the supplied adapter to adapt the cable to your computer. See Figure 3-20. Match the cable's color to the connector's color.

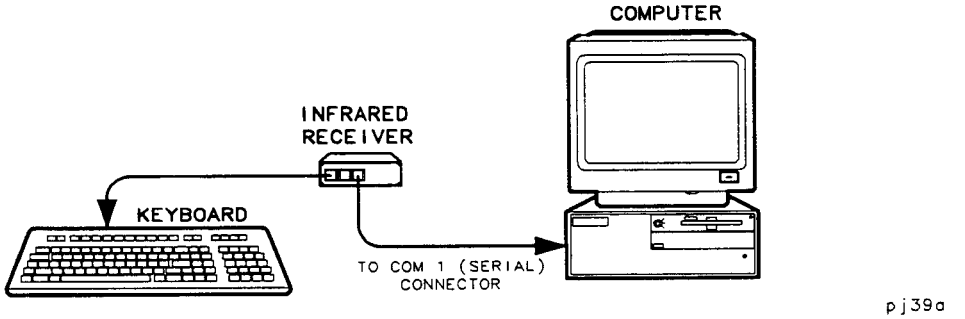


Figure 3-20. Connecting the Infrared Receiver COM1 Connector to a Personal Computer

Programming the Infrared Controller's Receiver

4. To load the program into the infrared controller's receiver, do the following:
   a. Insert the 3 1/2 inch disk into the computer.
   b. At the DOS prompt, type "A:LOAD A:IR4_1" (ENTER). A `LOADING` message appears during program execution.

NOTE

If an error message appears, examine all cable connections between the receiver/computer combination and the receiver/power source combination.

5. When completed (approximately 30 seconds), the computer to infrared controller connections can be disconnected. Initialize the infrared unit by pressing the spectrum analyzer's (PRESET) front-panel key.

4

Using the Infrared Controller's Transmitter Keys

Using the Infrared Controller's Transmitter Keys

This chapter describes, in alphabetical order, each of the HP 11951A Option 12D spectrum analyzer infrared controller's transmitter key functions.

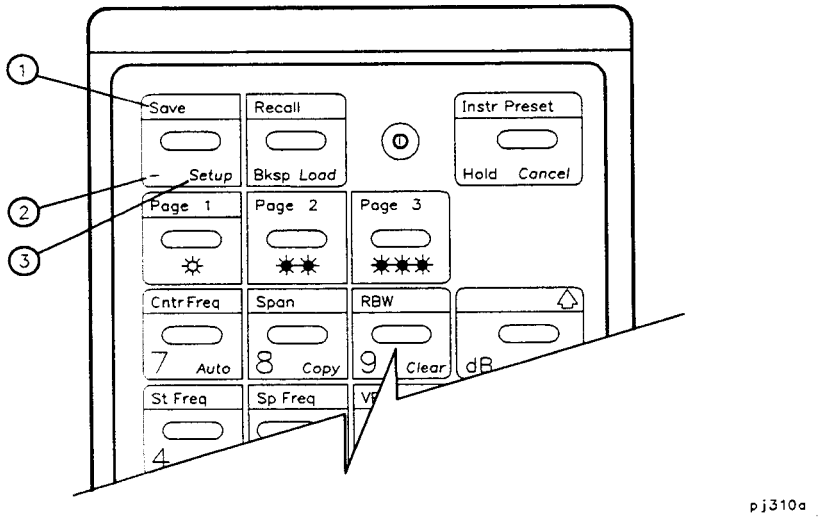


Figure 4-1. Transmitter Key Detail

The transmitter keys are arranged in three pages:

① Page 1	basic spectrum analyzer functions.
② Page 2	numeric keypad and terminators.
③ Page 3	HP 85712D EMC auto-measurement personality keys, and spectrum analyzer functions for trace B control, and the copy key.

Softkey Descriptions

This section describes the infrared controller's transmitter key functions.

.2-1 (Page 3 - DLP Function)

The .2-1GHz key selects the 120 kHz C.I.S.P.R. bandwidth and frequencies from 200 MHz to 1 GHz (CISPR bands C and D). A number (#) sign in the lower-left corner of the display indicates that the bandwidth is set to manual. When the bandwidth is set to manual, it will not change when the frequency span is changed. See Figure 4-1. When you select the 200 MHz to 1 GHz frequency band softkey, the analyzer automatically sets the spectrum analyzer functions listed below to the indicated values:

Input Attenuation	10 dB
Reference Level	90 dBμV
Resolution Bandwidth	120 kHz
Video Bandwidth (Auto Coupled)	300 kHz
Start Frequency	200 MHz
Stop Frequency	1 GHz
Center Frequency Step Size	10 MHz

If you wish to set a specific center frequency or center frequency step size, you should do so *after* selecting the `.2-1GHz SETUP` softkey.

CISPR recommends using specific bandwidths to make commercial compliance measurements. Using the recommended CISPR bandwidth for a given frequency range helps determine the relevant signal characteristics. For example, broadband signals change in amplitude as the resolution bandwidth changes. Therefore, using the appropriate CISPR bandwidth while evaluating signals will help you predict their behavior during actual compliance testing. Use the 120 kHz bandwidth for measurements from 30 MHz to 1 GHz.

DLP Access: `EMC Config` `Freq Bands` `.2-1 GHz SETUP`

30-300 (Page 3 - DLP Function)

The 30-300MZ key selects the 120 kHz C.I.S.P.R. bandwidth and frequencies from 30 MHz to 300 MHz (CISPR band C). A number (#) sign in the lower-left corner of the display indicates that the bandwidth is set to manual. When the bandwidth is set to manual, it will not change when the frequency span is changed. See Figure 4-2. When you select the 30 to 300 MHz setup softkey, the analyzer automatically sets the spectrum analyzer functions listed below to the indicated values:

Input Attenuation	10 dB
Reference Level	90 dBμV
Resolution Bandwidth	120 kHz
Video Bandwidth (Auto Coupled)	300 kHz
Start Frequency	30 MHz
Stop Frequency	300 MHz
Center Frequency Step Size	10 MHz

If you wish to set a specific center frequency or center frequency step size, you should do so *after* selecting the `30-300MZ SETUP` softkey.

CISPR recommends using specific bandwidths to make commercial compliance measurements. Using the recommended CISPR bandwidth for a given frequency range helps determine the relevant signal characteristics. For example, broadband signals change in amplitude as the resolution bandwidth changes. Therefore, using the appropriate CISPR bandwidth while evaluating signals will help you predict their behavior during actual compliance testing. Use the 120 kHz bandwidth for measurements from 30 MHz to 300 MHz.

DLP Access: `EMC Config` `Freq Bands` `30-300 MZ SETUP`

A–B (Page 3 - Spectrum Analyzer Function)

The A–B key subtracts the data in trace B from the measured data in trace A. A minus sign (–) appears between the trace A status and the trace B status in the screen annotation while the function is active.

The A–B -> A function is a math function. Unlike operations on dBm units, math functions operate on measurement units. Measurement units are used to format trace data for data within the graticule limits. The displayed amplitude of each element falls on one of 8000 vertical points with the value of 8000 being equal to the reference level. For log scale data, each point is equal to 0.01 dB. The peak of a signal equal to –10 dBm, or one division below the reference level, is equal to 7000 measurement units (8000 – 1000 = 7000). In linear mode, each point has a resolution of [reference level involts/8000].

For example, if trace A contains amplitude values of –10 dBm and trace B contains amplitude values of –40 dBm, the result of the A – B -> A function would be –10.004 dBm if dBm units were used. Since measurement units are used for the A – B -> A function, the result of A – B -> A is –50 dBm (–10 dBm = 7000 measurement units, –40 dBm = 4000 measurement units; the result is 3000 measurement units, which is equal to –50 dBm).

Front-Panel Key Access: (TRACE)

Auto (Page 3 - DLP Function)

The Auto key starts the data taking sequence for the frequency range on the display. First, multiple, fast sweeps are taken in max-hold mode. Next, signals at or above the limit, minus margin level, are identified and measured in the selected detection modes. If the limit is not on, signals above the peak excursion are identified and measured.

CAUTION Auto will overwrite data stored in trace registers 7, 8, 9, and 10. Any trace data previously stored in these registers will be lost.

Finally, the measured signals are displayed in a table or log frequency scale over the selected frequency band as vertical lines with horizontal bars for quasi-peak and average detected amplitudes. The display mode depends on what had been previously selected. The display is static and the appearance of `VIEW DATA` menu indicates the end of this measurement.

The selected frequency bands are overswept for frequency accuracy at the end points consistent with the span accuracy of 5%. The final report range will include data from the requested start frequency minus one bandwidth to the stop frequency plus one bandwidth. Amplitude and frequency data for each measured signal are stored in internal registers 7, 8, 9, and 10 for later printout in tabular format. A maximum of 20 signals per frequency band can be stored.

DLP Access: `EMC Automatn AUTO MEASURE`

Avg (Page 3 - DLP Function)

The Avg key performs an average measurement at the marker frequency and displays the results on the CRT.

DLP Access: `EMC Manual` `Qp/Avg` `AVG AUTO AT MKR`

Cancel (Page 3 - DLP Function)

Cancel revokes the setup catalog accessed by the [Setup] Infrared controller key. The [Cancel] key is useful if decide not to load a setup.

DLP Access: `EMC Config` `Setups` `Previous Menu`

Cntr Freq (Page 1 - Spectrum Analyzer Function)

The Center frequency key activates the center-frequency function to allow the selection of frequency that will be at the center of the screen.

The center frequency can also be changed by using the infrared controller's (Page 1) numeric keys or (Page 2) step keys.

Front-Panel Key Access: (FREQUENCY) (CENTER FREQ)

Clear (Page 3 - DLP Function)

The Clear key clears the markers and data displayed on the CRT after a quasi-peak or average measurement is made. The key must be pressed twice to clear the markers.

DLP Access: `EMC Manual Qp/Avg Marker Data CLEAR MARKERS`

Clr / Wr A (Page 1 - Spectrum Analyzer Function)

Clear Write A erases any data previously stored in trace A and continuously displays any signals during the sweep of the spectrum analyzer. This function is activated at power on and by pressing (PRESET).

Changing the trace mode of trace C to clear write or minimum hold can change the trace mode of trace A. If trace A is in clear-write mode or maximum-hold mode when trace C is changed to clear write or minimum hold, the trace mode of trace A is changed to store blank. The following table shows the trace mode of trace A before and after changing trace C to clear-write or minimum-hold trace mode.

Trace Mode of Trace A Before	Trace Mode of Trace A After
Clear write	Store blank
Maximum hold	Store blank
View	View

Changing the trace mode of trace A to clear write or maximum hold can change the trace mode of trace C. If trace C is in clear-write mode when trace A is changed to clear write or minimum hold, the trace mode of trace C is changed to minimum hold.

Trace Mode of Trace C Before	Trace Mode of Trace C After
Clear write	Minimum hold
Minimum hold	Minimum hold
View	View

Front-Panel Key Access: (TRACE)

Clr / Wr B (Page 3 - Spectrum Analyzer Function)

Clear write B erases any data previously stored in trace B and continuously displays any signals detected during the sweep of the spectrum analyzer. This function is activated at power on and by pressing (PRESET).

Changing the trace mode of trace C to clear write or minimum hold can change the trace mode of trace B. If trace B is in clear-write mode or maximum-hold mode when trace C is changed to clear write or minimum hold, the trace mode of trace B is changed to store blank.

The following table shows the trace mode of trace B before and after changing trace C to clear-write or minimum-hold trace mode.

Trace Mode of Trace B Before	Trace Mode of Trace B After
Clear write	Store blank
Maximum hold	Store blank
View	View

Changing the trace mode of trace B to clear write or maximum hold can change the trace mode of trace C. If trace C is in clear-write mode when trace B is changed to clear write or minimum hold, the trace mode of trace C is changed to minimum hold.

Trace Mode of Trace C Before	Trace Mode of Trace C After
Clear write	Minimum hold
Minimum hold	Minimum hold
View	View

Front-Panel Key Access: (TRACE)

Copy (Page 3 - Spectrum Analyzer Function)

The copy key initiates an output of the screen data, without an external controller, to a previously specified graphics printer or plotter. The printer or plotter must already have been specified using spectrum analyzer's (CONFIG) key and either the **PLOT CONFIG** (for a plotter) or **PRINT CONFIG** (for a printer) softkeys.

Front-Panel Key Access: (COPY)

Graph (Page 3 - DLP Function)

Graph displays data on log frequency scale. Data will be within the requested frequency range, plus one bandwidth on each side. The closest integer values of a 1, 2, 3. . . . ..10 sequence are taken for start and stop frequency.

NOTE

The (Return) or (Table) infrared controller keys must be pressed prior to any other key presses.

NOTE

Every vertical line represents the next integer value in HP 8590D and HP 8590E series analyzers and represents a multiple of 2 in HP 8590A and HP 8590B series analyzers.

Press (Copy) at any time to print the graph to a local printer or plotter. The Graph key is active only if auto data had been taken.

DLP Access: `EMC Automatn` `View Data` `VIEW LOG`

Hold (Page 1 - Spectrum Analyzer Function)

The Hold key deactivates the active function and blanks the active function text from the display. No data can be accidentally entered using the step keys, or keypad. Activating another function will turn off the hold function. The HOLD softkey can also be accessed by pressing the (DISPLAY) key.

Front-Panel Key Access:

- (DISPLAY) in HP 8590E series spectrum analyzers.
- (HOLD) in HP 8590A series spectrum analyzers.

Instr Preset (Page 1 - Spectrum Analyzer Function)

The Instr Preset key provides a convenient starting point for making most measurements. See Table 4-1 and Table 4-2 for the conditions established by pressing (PRESET).

The instrument preset function performs a processor test, but does not affect CAL data. Pressing (PRESET) clears both the input and output buffers, but does not clear trace B. The amplitude values of trace C are set to the reference level. Amplitude-correction factors are turned off. Limit-line testing is turned off, but the limit-line tables remain in spectrum analyzer memory. The status byte is set to 0. Instrument preset affects all operating modes. (See the key description for (MODE) in your spectrum analyzer's manual for more information about other operating modes.) Pressing (PRESET) erases all "on time" functions—ONCYCLE, ONDELAY, ONEOS, ONMKR, ONSRQ, ONSWP, ONTIME, and TRMATH. These are remote programming commands. Refer to your spectrum analyzer's manual for more information.

NOTE

Turning the spectrum analyzer on performs an instrument preset. Turning on the spectrum analyzer also fetches CAL data; completes a processor test; clears trace B, trace C, and both the input and output buffers; turns off amplitude correction factors; turns off limit-line testing; and sets the status byte to 0. The last state of the spectrum analyzer (before it was switched off) is recalled, unless IP has been set by the POWER ON function.

Front-Panel Key Access: (PRESET)

Table 4-1. Common Preset Conditions

A — B -> A	off
Amplitude correction factors	off
Amplitude units	default values
Annotation and graticule display	on
Attenuation	10 dB (auto-coupled)
Center frequency	Refer to Table 4-2.
CF step size	10% of span
Coupled functions	all set to AUTO
Coupling *	AC
Mass storage device (card or internal)	INTERNAL
Detector	positive peak
Display line level	2.5 graticule divisions below reference level, display off
Frequency offset	0 Hz
Limit-line testing	off
LIMIHI and LIMILO	cleared
Log scale	10 dB/division
Marker counter †	off
Marker counter resolution †	auto-coupled
Markers	off
Mixer level	—10 dBm
Operating mode	spectrum analyzer
Preselector peak ‡	reset
Reference level	0 dBm in power-on units
Reference level offset	0 dB
Reference level position	top (8th) graticule
Resolution bandwidth	3 MHz (auto-coupled)
Span	Refer to Table 4-2.
SRQ mask	octal 50
Start Frequency	Refer to Table 4-2.
Stop Frequency	Refer to Table 4-2.
State registers 1—8	unaffected
Sweep	continuous
Threshold level	one graticule above baseline, display off
Title	cleared

Table 4-1. Common Preset Conditions (continued)

Trace A	clear-write
Trace B	store-blank
Trace C	store-blank, at reference level
Trace registers	unaffected
Trigger	free run
VBW/RBW ratio	0.3
Video averaging	off
Video bandwidth	1 MHz (auto-coupled)

* HP 8594E, HP 8595E, or HP 8596E only.
† HP 8590E Option 013, HP 8591E, HP 8593E, HP 8594E, HP 8595E, or HP 8596E only.
‡ HP 8592E, HP 8593E, HP 8594E, HP 8595E, or HP 8596E only.

Table 4-2. Model Specific Preset Conditions

Model	Center Frequency	Span	Start Frequency	Stop Frequency	Sweep Time
HP 8590D	900 MHz	1.8 GHz	0 Hz	1.8 GHz	20 ms (auto-coupled) 20 ms (auto-coupled)
HP 8592D	12.38 GHz	19.25 GHz	2.75 GHz	22 GHz	385 ms, full span (auto-coupled)
HP 8593E	12.38 GHz	19.25 GHz	2.75 GHz	22 GHz	385 ms, full span (auto-coupled)
HP 8594E	1.450 GHz	2.9 GHz	0 Hz	2.9 GHz	58 ms (auto-coupled)
HP 8595E	3.25 GHz	6.5 GHz	0 Hz	6.5 GHz	130 ms (auto-coupled)
HP 8596E	6.4 GHz	12.8 GHz	0 Hz	12.8 GHz	256 ms (auto-coupled)

Load (Page 3 - DLP Function)

The Load key recalls custom setups from a RAM card or test setups from the HP 85712D ROM card (including, frequency range, limits, transducer factor, attenuation, bandwidth). The Setup key must be used first to catalog the RAM or ROM card. Press (Cancel) if you do not want to load a setup.

DLP Access: `EMC Manual` `Setups` `Load Setup`

Max A (Page 1 - Spectrum Analyzer Function)

The Max (Hold) A key maintains the maximum level for each trace point of trace A. Updates each trace point if a new maximum level is detected in successive sweeps.

Front-Panel Key Access: (TRACE) (MAX HOLD A)

Max B (Page 3 - Spectrum Analyzer Function)

The Max (Hold) B maintains the maximum level for each trace point of trace B. Updates each trace point if a new maximum level is detected in successive sweeps.

Front-Panel Key Access: (TRACE) (TRACE A B C) (MAX HOLD B)

Mkr ⇒ CF (Page 1 - Spectrum Analyzer Function)

The Marker to CF (center frequency) key changes the spectrum analyzer settings so that the frequency at the marker becomes the center frequency.

Front-Panel Key Access: [MKR->] or [PEAK SEARCH]

Mkr Peak (Page 1 - Spectrum Analyzer Function)

The Mkr (marker) Peak key turns on a marker and places the marker on the highest on-screen signal. The marker can then be moved using the step, keypad entry or [Peak⇒] or [Peak⇐] infrared controller keys.

Front-Panel Key Access: [PEAK SEARCH]

Peak ⇐ (Page 1 - Spectrum Analyzer Function)

The Peak left key moves the marker to the next peak to the left of the current marker. The signal peak must exceed the threshold value. If there is no peak to the left, the marker will not move.

Front-Panel Key Access: (PEAK SEARCH)

Peak ⇒ (Page 1 - Spectrum Analyzer Function)

The Peak right key moves the marker to the next peak to the right of the current marker. The signal peak must exceed the threshold value. If there is no peak to the right, the marker will not move.

Front-Panel Key Access: (PEAK SEARCH)

QP (Page 3 - DLP Function)

The QP key performs a quasi-peak measurement at the marker frequency and displays the results on the CRT.

> **NOTE**
> This key only active for spectrum analyzers with Option 103, which adds quasi-peak detection.

DLP Access: `EMC Manual Qp/Avg Qp AUTO AT MKR`

Recall (Page 1 - Spectrum Analyzer Function)

The Recall key allows you to recall instrument states from the memory card or spectrum analyzer memory. When INTERNAL is selected, states can be recalled from spectrum analyzer memory. When CARD is selected, states can be recalled from the memory card.

To use the recall key, a register number must be entered from the numeric keypad, then followed by the (ENTER) (Page 2) terminator.

Return (Page 3 - DLP Function)

Return returns you from Graph or Table View to the normal spectrum analyzer display.

Reference (Page 1 - Spectrum Analyzer Function)

The Reference key allows the reference level to be changed. The reference level is the amplitude power or voltage represented by the top graticule line on the screen. Changing the value of the reference level changes the absolute amplitude level (in field strength units) of the top graticule line. The value can be changed by using the (Page 1) step keys, or the (Page 2) numeric keys.

Front-Panel Key Access: (AMPLITUDE)

RBW (Page 1 - Spectrum Analyzer Function)

The Resolution Bandwidth key changes the spectrum analyzer's 3 dB or C.I.S.P.R. resolution bandwidth. As the resolution bandwidth is decreased, the sweep time is increased to maintain amplitude calibration. Resolution bandwidth is also related to span. As span is decreased, the resolution bandwidth is decreased. A "#" mark appears next to **RES BW** on the screen to indicate that it is not coupled. The resolution bandwidth can be changed using the (Page 1) step keys or the (Page 2) numeric keys.

Front-Panel Key Access: (AUTO COUPLE) or (BW)

Save (Page 1 - Spectrum Analyzer Function)

The Save key allows you to store instrument state data on a memory card or in spectrum analyzer memory. To use the save key, a register number must be entered from the numeric keypad. To save to, or catalog from, spectrum analyzer memory press the `INTERNAL CARD` (from the spectrum analyzer's front panel) so that INTERNAL is underlined. To save to, or catalog from, the memory card, press `INTERNAL CARD` so that CARD is underlined.

Saving state data saves the spectrum analyzer settings, but not the trace data. States are saved in spectrum analyzer memory (from the spectrum analyzer's front panel) even if the instrument is turned off or (PRESET) is pressed. Eight spectrum-analyzer-memory state registers are available for the user. The `Catalog Internal` softkey is used to access the catalog function. It also accesses the DLP editor utility.

Setup (Page 3 - DLP Function)

The Setup key catalogs all the setups on a RAM or ROM card and allows selection of a setup. The (⇧) and (⇩) infrared controller keys can be used to highlight the desired setup. Also refer to the (Load) and (Cancel) infrared controller keys.

DLP Access: `EMC Config Setups`

Sp Freq (Page 1 - Spectrum Analyzer Function)

The Stop Freq (frequency) key sets the frequency at the right side of the graticule. The left and right sides of the graticule correspond to the start and stop frequencies. When these frequencies are activated, their values are displayed below the graticule in place of center frequency and span. The stop frequency can be changed by using the (Page 1) step keys or the (Page 2) numeric keys.

Front-Panel Key Access: (FREQUENCY)

Span (Page 1 - Spectrum Analyzer Function)

The Span key activates the span function. Pressing span allows the user to change the frequency range symmetrically about the center frequency. The frequency-span readout describes the total displayed frequency range; to determine frequency span per horizontal graticule division, divide the frequency span by 10. The span can be changed by using the (Page 1) step keys or the (Page 2) numeric keys.

Front-Panel Key Access: (SPAN)

St Freq (Page 1 - Spectrum Analyzer Function)

The Start Freq (frequency) key sets the frequency at the left side of the graticule. The left and right sides of the graticule correspond to the start and stop frequencies. When these frequencies are activated, their values are displayed below the graticule in place of center frequency and span. The start frequency can be changed by using the (Page 1) step keys or the (Page 2) numeric keys.

Front-Panel Key Access: (FREQUENCY)

Swp Time (Page 1 - Spectrum Analyzer Function)

The Swp (sweep) Time key selects the length of time in which the spectrum analyzer sweeps the displayed frequency span. In all non-zero frequency spans, the sweep time varies from 20 milliseconds to 100 seconds. In zero frequency span, the fastest sweep time is 15 milliseconds. Reducing the sweep time increases the rate of sweeps. The sweep time can be changed by using the (Page 1) step keys or the (Page 2) numeric keys.

For Option 101 only: Option 101 provides sweep times from 20 μs to 20 ms in zero span.

Front-Panel Key Access: (AUTO COUPLE) or (SWEEP)

Table (Page 3 - DLP Function)

The Table key selects tabular display of data. Data must have been previously been taken using the (Auto) infrared controller key. The table consists of columns for frequency, peak, delta peak from limit, quasi-peak from limit,

average, delta average from limit. Press (Table) to review the data table in tabular form. Both the data and limit margin are displayed.

The results of the measurement will be displayed in tabular form according to the following:

NOTE

The (Return) or (Graph) infrared controller keys must be pressed prior to any other key presses.

Column 1	Number of detected peaks.
Column 2	Frequency in MHz.
Column 3	Peak (PK) value in field strength units.
Column 4	Peak distance from limit line in field strength units.
Column 5	Quasi-Peak (QP) value in field strength units.
Column 6	Quasi-Peak distance from limit line in field strength units.
Column 7	Average (AV) value in field strength units.
Column 8	Average distance from limit line in field strength units.

NOTE

Data is recorded in the columns of the table for detector modes chosen with the `DETECTOR PK QP AV` softkey.

Press (COPY) at any time to print either the table, log view, or linear view to a local printer.

DLP Access: `EMC Automatn View Data VIEW TABLE`

Trace B OFF (Page 3 - Spectrum Analyzer Function)

The Trace B OFF key stores the amplitude data for trace B and removes it from the screen. The trace B register will not be updated as the spectrum analyzer sweeps.

Front Panel Key Access: (TRACE)

VBW (Page 1 - Spectrum Analyzer Function)

The VBW key changes the spectrum analyzer's post-detection filter from 30 Hz to 3 MHz in a 1, 3, 10 sequence. *For Option 130 only.* Option 130 provides additional narrow resolution bandwidths of 30 Hz, 100 Hz, and 300 Hz.

As the video bandwidth is decreased, the sweep time is increased to maintain amplitude calibration. A "#" mark appears next to VBW on the bottom of the spectrum analyzer display to indicate that it is not coupled. To couple the video bandwidth, press `VID BW AUTO MAN` so that AUTO is underlined. The video bandwidth can be changed by using the step keys, or the numeric keypad on Page 2.

Front-Panel Key Access: (AUTO COUPLE) or (BW)

NOTE

Coupling the video bandwidth function also couples the video bandwidth to resolution bandwidth ratio function. If you want to auto-couple the video bandwidth to a nonstandard ratio, you must set the video bandwidth to auto-couple before setting the video-bandwidth/resolution-bandwidth ratio.

View A (Page 1 - Spectum Analyzer Function)

View A holds and displays the amplitude data that is in the trace A register. The trace A register is not updated as the spectrum analyzer sweeps. To resume sweeping, use the (Clr/Wr A) infrared controller key.

Front-Panel Key Access: (TRACE)

View B (Page 3 - Spectrum Analyzer Function)

View B holds and displays the amplitude data that is in the trace B register. The trace B register is not updated as the spectrum analyzer sweeps. To resume sweeping, use the (Clr/Wr B) infrared controller key.

Front-Panel Key Access: (TRACE)

Softkey Descriptions

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