Programming Code Compatibility Suite Guide Option 266

Agilent Technologies
PSA Spectrum Analyzers

This manual provides documentation for the following instruments with Option 266 Installed:

PSA Series
E4440A (3 Hz - 26.5 GHz)
E4443A (3 Hz - 6.7 GHz)
E4445A (3 Hz - 13.2 GHz)
E4446A (3 Hz - 44.0 GHz)
E4447A (3 Hz - 42.98 GHz)
E4448A (3 Hz - 50.0 GHz)

Agilent Technologies

Manufacturing Part Number: E4440-90628
Supersedes: E4440-90352

Printed in USA

June 2008

Notice

The information contained in this document is subject to change without notice.

Agilent Technologies makes no warranty of any kind with regard to this material, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Where to Find the Latest Information

Documentation is updated periodically. For the latest information about Agilent PSA Spectrum Analyzers, including firmware upgrades, software upgrades, application information, and product information, please visit the Internet URL listed below:

http://www.agilent.com/find/psa

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

1 Getting Started

Getting Started

Option 266 Description

Option 266 (PSA Series Programming Code Compatibility Suite) for Agilent Technologies' PSA series of spectrum analyzers allows the analyzer to be controlled using many of the remote programming commands from the following analyzers:

- 8560 E/EC Series Portable Spectrum Analyzers, comprising:
  - — 8560E
  - — 8560EC
  - — 8561E
  - — 8561EC
  - — 8562E
  - — 8562EC
  - — 8563E
  - — 8563EC
  - — 8564E
  - — 8564EC
  - — 8565E
  - — 8565EC
- 8566A/B
- 8568A/B
- 8590 E/L Series Portable Spectrum Analyzers, comprising:
  - — 8590L
  - — 8591E
  - — 8592L
  - — 8593E
  - — 8594E
  - — 8594L
  - — 8595E
  - — 8596E

NOTE The 8566A/B and the 8568A/B are not considered part of the 8560 series of analyzers.

Option 266 is designed to replace these analyzers in many automated systems with minimal or no modification to the currently used measurement software.

Option 266 Limitations

The Agilent Option 266 (PSA Series Programming Code Compatibility Suite) has been designed to emulate as closely as possible the operation of the specified spectrum analyzers. It is not, however, intended as an absolute direct replacement for these analyzers.

Supported commands

Only a subset of the 8566/8568/8560 Series/8590 Series commands is supported in this option (through a GPIB interface). These supported commands were determined by feedback from our customers combined with technical considerations and constraints.

Predefined Functions

In the 8566/8568/8560 Series/8590 Series analyzers, a “predefined function” is an analyzer command that returns a number that can be operated on by other analyzer commands. “Predefined variables” follow the same idea, except the value to be passed as a parameter to the next command is stored in a variable.

Option 266 does not support this type of behavior, so any commands that originally acted as predefined functions or variables, or that allowed predefined functions or variables as arguments in the 8566/8568/8560 Series/8590 Series analyzers, will no longer do so.

User-defined Functions

No user-defined functions, traces, or variables (FUNCDEF, TRDEF or VARDEF) can be used as arguments or commands in programs controlling any analyzer running Option 266. In addition, the behavior of certain commands that rely on the “active functions” (UP, DN, etc.) may be slightly different.

Hardware and Firmware Requirements for Option 266

One of the following Agilent spectrum analyzers and associated hardware options is required to run Option 266.

Table 1-1 Compatible Agilent PSA Series Spectrum Analyzers

Analyzer Model Number	Upper Frequency Limit	Firmware	PSA Series Programming Code Compatibility Suite Personality
E4440A	26.5 GHz	A.10.00 or later	Option 266
E4443A	6.7 GHz	A.10.00 or later	Option 266
E4445A	13.2 GHz	A.10.00 or later	Option 266
E4446A	44.0 GHz	A.10.00 or later	Option 266
E4447A	42.98 GHz	A.10.00 or later	Option 266
E4448A	50.0 GHz	A.10.00 or later	Option 266

For maximum compatibility, you should select a PSA Series analyzer that best matches the frequency range of your chosen remote language. The frequency limits of the remote languages are listed below.

Table 1-2 Frequency Ranges of the Remote Languages

Remote Language	Start Frequency	Stop Frequency[a]
8560E/EC	0 Hz	2.9 GHz
8561E/EC	0 Hz	6.5 GHz
8562E/EC	0 Hz	13.2 GHz
8563E/EC	0 Hz	26.5 GHz
8564E/EC	0 Hz	40.0 GHz
8565E/EC	0 Hz	50.0 GHz
8566A	0 Hz	22.0 GHz
8566B	0 Hz	22.0 GHz
8568A	0 Hz	1.5 GHz
8568B	0 Hz	1.5 GHz
8590L	0 Hz	1.8 GHz
8591E	0 Hz	1.8 GHz

Table 1-2 Frequency Ranges of the Remote Languages

Remote Language	Start Frequency	Stop Frequency[a]
8592L[b]	0 Hz	22.0 GHz
8593E[b]	0 Hz	22.0 GHz
8594E	0 Hz	2.9 GHz
8595E	0 Hz	6.5 GHz
8596E[b]	0 Hz	12.8 GHz

a. Or the upper frequency range of the PSA (whichever one is lower). For example, the E4445A will only have a stop frequency of 13.2 GHz when emulating an 8563E/EC.

b. The command HNLOCK (Harmonic Lock) is not supported in Option 266. Thus, the different frequency spans associated with the various harmonic bands are also not supported.

Installing Option 266

You must load the desired personality option into the instrument memory. Loading can be done from a firmware CD-ROM or from the internet location. An automatic loading program comes with the files and runs from your PC.

Installing Optional Measurement Personalities

When you install a measurement personality, you need to follow a three step process:

1. Determine whether your memory capacity is sufficient to contain all the options you want to load. If not, decide which options you want to install now, and consider upgrading your memory. Details follow in "Do You Have Enough Memory to Load All Your Personality Options?" on page 1-30.
2. Install the measurement personality firmware into the instrument memory. Details follow in "Loading an Optional Measurement Personality" on page 34.
3. Enter a license key that activates the measurement personality. Details follow in "Obtaining and Installing a License Key" on page 34.

Adding measurement personalities requires the purchase of an upgrade kit for the desired option. The upgrade kit contains the measurement personality firmware and an entitlement certificate that is used to generate a license key from the internet website. A separate license key is required for each option on a specific instrument serial number and host ID.

For the latest information on Agilent Spectrum Analyzer options and upgrade kits, visit the following web location:

http://www.agilent.com/find/sa_upgrades

Do You Have Enough Memory to Load All Your Personality Options?

If you do not have memory limitations then you can skip ahead to the next section "Loading an Optional Measurement Personality" on page 1-34. If after installing your options you get error messages relating to memory issues, you can return to this section to learn more about how to optimize your configuration.

If you have 64 MBytes of memory installed in your instrument, you should have enough memory to install at least four optional personalities, with plenty of memory for data and states.

The optional measurement personalities require different amounts of memory. So the number of personalities that you can load varies. This is also impacted by how much data you need to save. If you are having memory errors you must swap the applications in or out of memory as needed. If you only have 48 MBytes of memory, you can upgrade your hardware to 64 MBytes.

Additional memory can be added to any PSA Series analyzer by installing Option 115. With this option installed, you can install all currently available measurement personalities in your analyzer and still have memory space to store more state and trace files than would otherwise be possible.

To see the size of your installed memory for PSA Series Spectrum Analyzers:

1. Ensure that the spectrum analyzer is in spectrum analyzer mode because this can affect the screen size.
2. Press **System**, **More**, **Show Hdwr**.
3. Read `Flash Memory` size in the table. If Option 115 is installed, the table will also show `Compact Flash Type` and `Compact Flash Size`.

PSA Flash Memory Size	Available Memory Without Option B7J and Option 122 or 140	Available Memory With Option B7J and Option 122 or 140
64 Mbytes	32.5 MBytes	30.0 MBytes
48 Mbytes	16.9 MBytes	14.3 MBytes

PSA Compact Flash Memory Size	Available Additional Memory for Measurement Personalities
512 Mbytes (Opt. 115)	512 MBytes

If you have 48 MBytes of memory, and you want to install more than 3 optional personalities, you may need to manage your memory resources. The following section, "How to Predict Your Memory Requirements" on page 1-31, will help you decide how to configure your installed options to provide optimal operation.

How to Predict Your Memory Requirements

If you plan to install many optional personalities, you should review your memory requirements, so you can determine whether you have enough memory (unless you have a PSA Series with Option 115). There is an Agilent "Memory Calculator" available online that can help you do this, or you can make a calculated approximation using the information that follows. You will need to know your instrument's installed memory size as determined in the previous section and then select your desired applications.

NOTE If you have a PSA Series analyzer with Option 115, there is adequate memory to install all of the available optional personalities in your instrument.

To calculate the available memory on your PSA, see:

http://sa.tm.agilent.com/PSA/memory/

Select the “Memory Calculator” link. You can try any combination of available personalities to see if your desired configuration is compatible with your installed memory.

NOTE After loading all your optional measurement personalities, you should have a reserve of ~2 MBytes memory to facilitate mode switching. Less available memory will increase mode switching time. For example, if you employ excessive free memory by saving files of states and/or data, your mode switching time can increase to more than a minute.

You can manually estimate your total memory requirements by adding up the memory allocations described in the following steps. Compare the desired total with the available memory that you identified in the previous section.

1. Program memory - Select option requirements from the table “Measurement Personality Options and Memory Required” on page 1-33.
2. Shared libraries require 7.72 MBytes.
3. Recommended mode swap space is 2 MBytes.
4. Screens - .gif files need 20-25 kBytes each.
5. State memory - State file sizes range from 21 kB for SA mode to 40 kB for W-CDMA. The state of every mode accessed since power-on will be saved in the state file. File sizes can exceed 150 kB each when several modes are accessed, for each state file saved.

TIP State memory retains settings for all states accessed before the **Save State** command. To reduce this usage to a minimum, reduce the modes accessed before the **Save State** is executed. You can set the PSA to boot into a selected mode by accessing the desired mode, then pressing the **System**, **Power On/Preset**, **Power On** keys and toggle the setting to **Last**.

Measurement Personality Options and Memory Required

Personality Options for PSA Series Spectrum Analyzers [a]	Option	File Size (PSA Rev: A.10)
cdmaOne measurement personality	**BAC**	1.91 Mbytes
NADC and PDC measurement personalities (not available separately)	**BAE**	2.43 Mbytes
W-CDMA or W-CDMA, HSDPA, HSUPA measurement personality	**BAF**, **210**	5.38 Mbytes[b]
cdma2000 or cdma2000 w/ 1xEV-DV measurement personality	**B78**, **214**	4.00 Mbytes[b]
1xEV-DO measurement personality	**204**	5.61 Mbytes[b]
GSM (with EDGE) measurement personality	**202**	3.56 Mbytes[b]
Shared measurement library[b]	n/a	7.72 Mbytes
Phase Noise measurement personality	**226**	2.82 Mbytes[c]
Noise Figure measurement personality	**219**	4.68 Mbytes[c]
Basic measurement personality with digital demod hardware	**B7J**	Cannot be deleted (2.64 Mbytes)
Programming Code Compatibility Suite[d] (8560 Series, 8590 Series, and 8566/8568)	**266**	1.18 Mbytes[c]
TD-SCDMA Power measurement personality	**211**	5.47 Mbytes[c]
TD-SCDMA Modulation Analysis or TD-SCDMA Modulation Analysis w/ HSDPA/8PSK measurement personality	**212, 213**	1.82 Mbytes
Flexible Digital Modulation Analysis	**241**	2.11 Mbytes[b]
WLAN measurement personality	**217**	3.24 Mbytes[b]
External Source Control	**215**	0.72 Mbytes[c]
Measuring Receiver Personality (available with Option 23A - Trigger support for AM/FM/PM and Option 23B - CCITT filter)	**233**	2.91 Mbytes[b]
EMC Analyzer	**239**	4.06 Mbytes[b]

a. Available as of the print date of this guide.
b. Many PSA Series personality options use a 7.72 Mbyte shared measurement library. If you are loading multiple personalities that use this library, you only need to add this memory allocation once.
c. Shared measurement library allocation not required.
d. This is a no charge option that does not require a license key.

Memory Upgrade Kits

The PSA 64 MByte Memory Upgrade kit part number is E4440AU-ANE. The PSA Compact Flash Upgrade kit part number is E4440AU-115.

For more information about memory upgrade kits contact your local sales office, service office, or see:
http://www.agilent.com/find/sa_upgrades

Loading an Optional Measurement Personality

You must use a PC to load the desired personality option into the instrument memory. Loading can be done from a firmware CD-ROM or by downloading the update program from the internet. An automatic loading program comes with the files and runs from your PC.

You can check the Agilent internet website for the latest PSA firmware versions available for downloading:

http://www.agilent.com/find/psa_firmware

NOTE When you add a new option, or update an existing option, you will get the updated versions of all your current options as they are all reloaded simultaneously. This process may also require you to update the instrument core firmware so that it is compatible with the new option.

Depending on your installed hardware memory, you may not be able to fit all of the available measurement personalities in instrument memory at the same time. You may need to delete an existing option file from memory and load the one you want. Use the automatic update program that is provided with the files. Refer to the table showing “Measurement Personality Options and Memory Required” on page 1-33. The approximate memory requirements for the options are listed in this table. These numbers are worst case examples. Some options share components and libraries, therefore the total memory usage of multiple options may not be exactly equal to the combined total.

Obtaining and Installing a License Key

If you purchase an optional personality that requires installation, you will receive an “Entitlement Certificate” which may be redeemed for a license key specific to one instrument. Follow the instructions that accompany the certificate to obtain your license key.

To install a license key for the selected personality option, use the following procedure:

NOTE You can also use this procedure to reinstall a license key that has been deleted during an uninstall process, or lost due to a memory failure.

1. Press **System**, **More**, **More**, **Licensing**, **Option** to accesses the alpha editor. Use this alpha editor to enter letters (upper-case), and the front-panel numeric keys to enter numbers for the option designation. You will validate your option entry in the active function area of the display. Then, press the **Enter** key.
2. Press **License Key** to enter the letters and digits of your license key. You will validate your license key entry in the active function area of the display. Then, press the **Enter** key.
3. Press the **Activate License** key.

Viewing a License Key

Measurement personalities purchased with your instrument have been installed and activated at the factory before shipment. The instrument requires a **License Key** unique to every measurement personality purchased. The license key is a hexadecimal number specific to your measurement personality, instrument serial number and host ID. It enables you to install, or reactivate that particular personality.

Use the following procedure to display the license key unique to your personality option that is already installed in your PSA:

Press **System**, **More**, **More**, **Licensing**, **Show License.** The **System**, **Personality** key displays the personalities loaded, version information, and whether the personality is licensed.

NOTE *You will want to keep a copy of your license key in a secure location. Press* ***System****,* ***More****, then* ***Licensing****,* ***Show License****, and print out a copy of the display that shows the license numbers. If you should lose your license key, call your nearest Agilent Technologies service or sales office for assistance.*

Using the Delete License Key on PSA

This key will make the option unavailable for use, but will not delete it from memory. Write down the 12-digit license key for the option before you delete it. If you want to use that measurement personality later, you will need the license key to reactivate the personality firmware.

NOTE Using the **Delete License** key does not remove the personality from the instrument memory, and does not free memory to be available to install another option. If you need to free memory to install another option, refer to the instructions for loading firmware updates located at the URL : http://www.agilent.com/find/psa/

1. Press **System**, **More**, **More**, **Licensing**, **Option**. Pressing the **Option** key will activate the alpha editor menu. Use the alpha editor to enter the letters (upper-case) and the front-panel numeric keyboard to enter the digits (if required) for the option, then press the **Enter** key. As you

enter the option, you will see your entry in the active function area of the display.

2. Press **Delete License** to remove the license key from memory.

Ordering Optional Measurement Personalities

When you order a personality option, you will receive an entitlement certificate. Then you will need to go to the Web site to redeem your entitlement certificate for a license key. You will need to provide your instrument serial number and host ID, and the entitlement certificate number.

Required Information:	Front Panel Key Path:
Model #: (Ex. E4440A)	
Host ID: ________________	**System**, **Show System**
Instrument Serial Number: ________________	**System**, **Show System**

Configuring Option 266 on PSA Analyzers

Figure 1-1 shows the menu map to configure Option 266 (Programming Code Compatibility Suite) on your spectrum analyzer. Pressing **System, Config I/0, Configure Remote Lang, Language** on a PSA Series analyzer allows you to select the remote programming language for the instrument you are replacing.

Figure 1-1 System Menu Map for Option 266 on PSA Series Analyzers

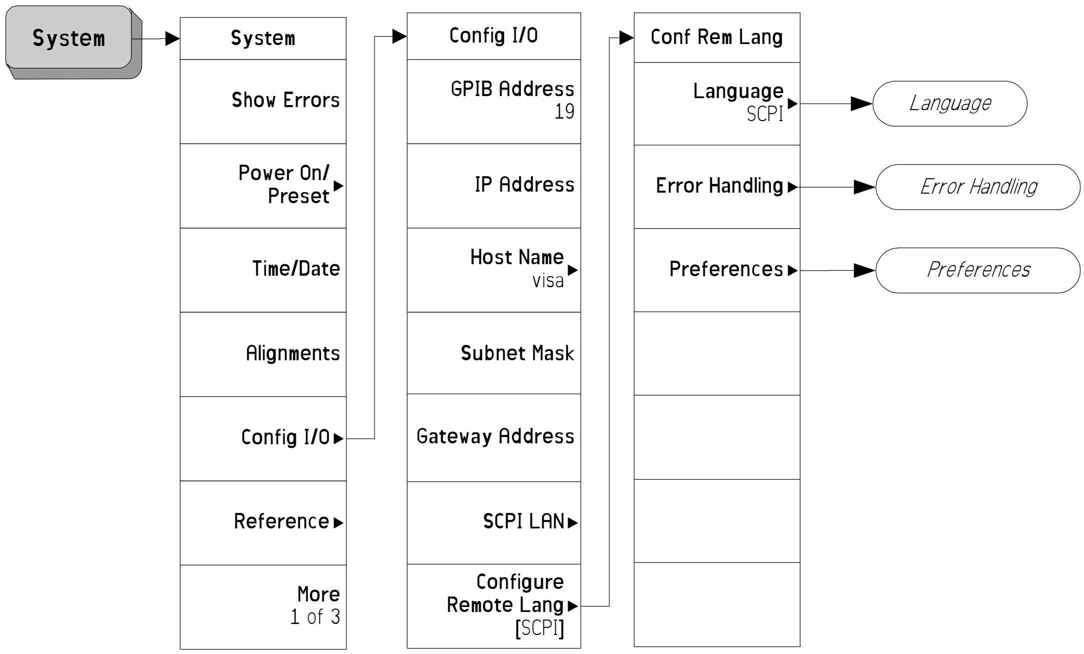
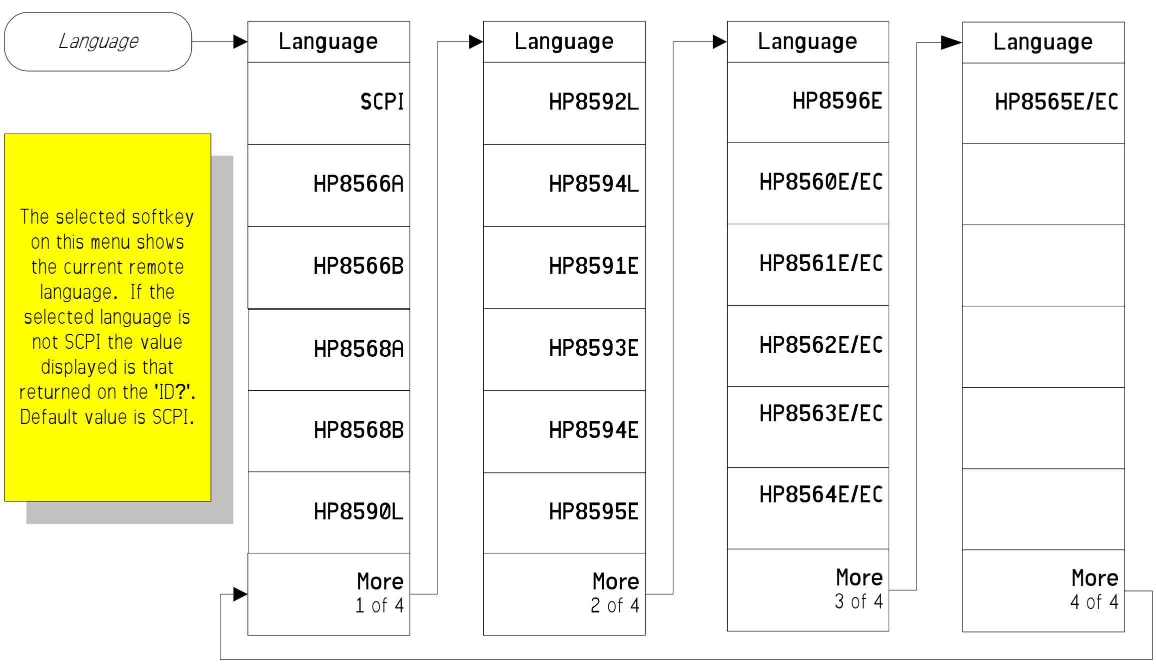


Figure 1-2 Language Link Menu Map for All Analyzers



NOTE	The language softkeys are not in alphanumeric order.

Figure 1-3 Error Handling Link Menu Map

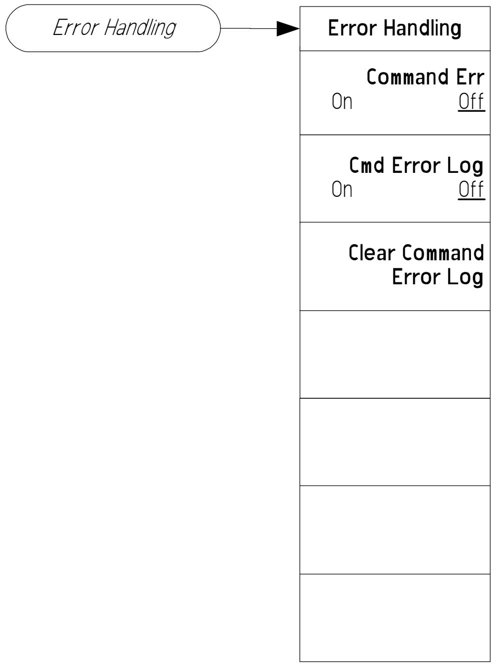


Figure 1-4 Preferences Link Menu Map

Getting Started

The Configure Remote Lang Screen Menu - PSA Analyzers

Configure Remote Lang

This key displays a menu allowing you to select the remote language you wish to use, and to determine how command error messages are stored and displayed.

Language

This key allows you to select which remote programming language you wish to use.

SCPI — Selects the **SCPI** remote programming language. This is the default setting after installation.

HP8560E/EC — Selects the **HP8560E/EC** remote programming language and sets the response to the remote programming command 'ID?' to **HP8560E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8561E/EC — Selects the **HP8561E/EC** remote programming language and sets the response to the remote programming command 'ID?' to **HP8561E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8562E/EC — Selects the **HP8562E/EC** remote programming language and sets the response to the remote programming command 'ID?' to **HP8562E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8563E/EC — Selects the **HP8563E/EC** remote programming language and sets the response to the remote programming command 'ID?' to **HP8563E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8564E/EC — Selects the **HP8564E/EC** remote programming language and sets the response to the remote programming command 'ID?' to **HP8564E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8565E/EC — Selects the **HP8565E/EC** remote programming language and sets the response to the remote programming command 'ID?' to **HP8565E**. It also performs an

	instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8566A	Selects the **HP8566A** remote programming language and sets the response to the remote programming command 'ID?' to **HP8566A**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8566B	Selects the **HP8566B** remote programming language and sets the response to the remote programming command 'ID?' to **HP8566B**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8568A	Selects the **HP8568A** remote programming language and sets the response to the remote programming command 'ID?' to **HP8568A**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8568B	Selects the **HP8568B** remote programming language and sets the response to the remote programming command 'ID?' to **HP8568B**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8590L	Selects the **HP8590L** remote programming language and sets the response to the remote programming command 'ID?' to **HP8590L**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8591E	Selects the **HP8591E** remote programming language and sets the response to the remote programming command 'ID?' to **HP8591E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8592L	Selects the **HP8592L** remote programming language and sets the response to the remote programming command 'ID?' to **HP8592L**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.
HP8593E	Selects the **HP8593E** remote programming language and

Getting Started

sets the response to the remote programming command 'ID?' to **HP8593E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8594E — Selects the **HP8594E** remote programming language and sets the response to the remote programming command 'ID?' to **HP8594E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8594L — Selects the **HP8594L** remote programming language and sets the response to the remote programming command 'ID?' to **HP8594L**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8595E — Selects the **HP8595E** remote programming language and sets the response to the remote programming command 'ID?' to **HP8595E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8596E — Selects the **HP8596E** remote programming language and sets the response to the remote programming command 'ID?' to **HP8596E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

NOTE Setting the remote language to anything other than 'SCPI' does not affect the response to the SCPI command '*IDN?' This command will still return the model number and firmware version number of the PSA Series spectrum analyzer.

Table 1-3 Span, Trace Points, Couplings, VBW/RBW Ratio, and Span/RBW Ratio Settings

Remote Language	Start Freq.	Stop Freq.	Number of Trace Points	RF Coupling	VBW/RBW Ratio	Span/RBW Ratio
HP8560E/EC	0 Hz	2.9 GHz	601	AC	1	91
HP8561E/EC	0 Hz	6.5 GHz	601	AC	1	91
HP8562E/EC	0 Hz	13.2 GHz	601	AC	1	91
HP8563E/EC	0 Hz	26.5 GHz	601	AC	1	91

Table 1-3 Span, Trace Points, Couplings, VBW/RBW Ratio, and Span/RBW Ratio Settings

Remote Language	Start Freq.	Stop Freq.	Number of Trace Points	RF Coupling	VBW/RBW Ratio	Span/RBW Ratio
HP8564E/EC	0 Hz	40 GHz	601	AC	1	91
HP8565E/EC	0 Hz	50 GHz	601	AC	1	91
HP8566A	2 GHz	22 GHz	1001	DC	3 (VBW one step wider than RBW)	106
HP8566B	2 GHz	22 GHz	1001	DC	3 (VBW one step wider than RBW)	106
HP8568A	0 Hz	1.5 GHz	1001	DC	3 (VBW one step wider than RBW)	106
HP8568B	0 Hz	1.5 GHz	1001	DC	3 (VBW one step wider than RBW)	106
HP8590L	0 Hz	1.8 GHz	401	DC	0.3	106
HP8591E	0 Hz	1.8 GHz	401	DC	0.3	106
HP8592L	2.75 GHz	22 GHz	401	DC	0.3	106
HP8593E	2.75 GHz	22 GHz	401	DC	0.3	106
HP8594E	0 Hz	2.9 GHz	401	AC	0.3	106
HP8594L	0 Hz	2.9 GHz	401	DC	0.3	106
HP8595E	0 Hz	6.5 GHz	401	AC	0.3	106
HP8596E	0 Hz	12.8 GHz	401	AC	0.3	106

Command Err This key determines whether or not command errors are displayed on the screen. When set to **On**, error messages generated by unrecognized commands or command arguments are displayed on the screen. When set to **Off**, error messages generated by unrecognized commands are not displayed. The current setting is underlined on the key label, and this setting is toggled each time the key is pressed.

Cmd Error Log This key sets command error logging **On** or **Off**. When set to **On**, all error messages are stored in a log file, regardless of whether they have been displayed on the screen. When set to **Off**, no further command error messages are written to the log file.

The log file is an ASCII text file called `LOGFILE.TXT` on the C: drive. It has a maximum size of 32 KB. Once it has reached its maximum size, no further error messages will be recorded, but a message will be displayed prompting you to clear the log file. Switching **Cmd Error Log** to **Off** does not clear the log file. Only the **Clear Command Error Log** softkey will clear the error log.

Clear Command Error Log This key allows you to clear all messages from the command error log file `LOGFILE.TXT`. You will be asked to press the key a second time to confirm your decision to clear the log file.

Limit RBW/VBW This key toggles the **Limit RBW/VBW** between On and Off. Setting it to On causes the range of values for resolution and video bandwidths to be limited, dependent on the remote language selected.

NOTE This restriction on RBW and VBW range changes to use the base PSA range of bandwidths if the detector type is set to Quasi Peak, MIL Peak, EMI Average, or Average.

Setting this key to Off causes the resolution bandwidth and video bandwidth filters to use the base PSA range of values for all remote languages.

Atten Offset This key toggles a supplemental attenuation On and Off. The default state is Off. Setting it to On sets a fixed 12 dB supplemental attenuation in the hardware to prevent too great a signal at the input to the mixer (0 dBm maximum) for
reference level settings of up to +12 dBm. The selected condition is preserved when **Preset** is pressed or power is cycled.

Save Reg 7 This key enables or disables the saving of the Preset State in Register 7 (RC 7). Setting this to On causes the Preset State to be saved in Register 7, but it can slow your analyzer down. Setting this to Off will make your analyzer run faster, but the Preset State is not saved in Register 7.

Running Software that Requires SCPI Commands

When a Remote Language other than SCPI has been selected, you will only have access to a very small subset of SCPI commands. If you are not familiar with the SCPI remote programming language, Chapter 5 , "A Brief Introduction to the SCPI Language,"on page 373 contains some useful information.

The SCPI commands available while using other remote languages are:

- **`*IDN?`**

  Queries and returns the instrument identification string.

- **`*RST`**

  Performs an instrument preset.

- **`:SYSTem:LANGuage SCPI | HP8560E | HP8561E | HP8562E | HP8563E | HP8564E | HP8565E | HP8566A | HP8566B | HP8568A | HP8568B | HP8590L | HP8591E | HP8592L | HP8593E | HP8594E | HP8594L | HP8595E | HP8596E`**

  Sets the current remote language. This command is only available if you have Option 266 installed on your analyzer.

NOTE Agilent Technologies recommends that you do not repeatedly swap to and from the SCPI language within your programs.

- **`:SYSTem:LANGuage?`**

  Queries and returns the current remote language. This command is only available if you have Option 266 installed on your analyzer.

- **`[:SENSe]:SWEep:TYPE AUTO|SWEep|FFT`**

  Sets the Sweep Type. This command is only valid on the PSA Series of analyzers.

- **`[:SENSe]:SWEep:TYPE?`**

  Queries and returns the Sweep Type. This command is only valid on the PSA Series of analyzers.

- **`[:SENSe]:SWEep:TYPE:AUTO:RULes SPEed|DRANge`**

  Sets the auto rule setting for FFT and Sweep Type. This command is only valid on the PSA Series of analyzers.

- **`[:SENSe]:SWEep:TYPE:AUTO:RULes?`**

  Queries and returns the auto rule setting for FFT and Sweep Type. This command is only valid on the PSA Series of analyzers.

- **`:SYSTem:OPTion?`**

Returns a list of installed options.

If Option 266 is installed on your analyzer, the string “266” will appear in the returned string. In the following example, options B7J, 266, and 110 are all installed.

Example: `"B7J,266,110"`

To return the analyzer to its full PSA SCPI capability, you must specify the remote language as SCPI.

Service and Calibration

Since the Performance Verification and Adjustment Software uses the SCPI command language, you will need to set Remote Language to SCPI prior to calibration or service of your Agilent spectrum analyzer.

When your analyzer is returned from an Agilent Technologies service center, you may have to reinstall Option 266. Refer to "Installing Option 266" on page 30.

Documentation for Option 266

Spectrum Analyzers with Option 266

When you purchase your PSA Series spectrum analyzer with the Programming Code Compatibility Suite (Option 266), you will receive this manual - the *Programming Code Compatibility Suite Guide*. For information on PSA series analyzers and other related documentation, refer to the PSA web site at http://www.agilent.com/find/psa/.

This *Programming Code Compatibility Suite Guide* is not designed to be a comprehensive guide to all legacy commands. It gives brief descriptions of the supported commands, and highlights important functional or behavioral differences that you should be aware of when transferring your existing code to your PSA Series analyzer. For a fuller description of these commands, refer to the manuals supplied with your original analyzer.

Spectrum Analyzer Updates

For the latest information about this instrument, including software upgrades, application information, and product information, please visit the URL below.

Updating the Firmware and Software

Updated versions of the Agilent Spectrum Analyzers' firmware and software will be available via several sources. Information on the latest firmware and software revision can be accessed through the following URL:

http://www.agilent.com/find/psa/

NOTE If you have received Option 266 as an upgrade, the latest version of the analyzer's firmware has been included and should be loaded into your instrument before installing the Option 266.

2 Legacy Analyzer Command List

Table of All Legacy Analyzer Commands

The following table lists all of the original programming commands from the legacy analyzers (that is, the 8566A/B, the 8568A/B, the 8560 Series and the 8590 Series), and indicates which are supported in Option 266. Refer to the alphabetical listing of commands in Chapter 4 , "Programming Commands," on page 85 for more detailed information about each supported command.

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
A1	Clear-writes trace A	Yes	Yes	Yes	Yes	Page 89
A2	Max Holds trace A	Yes	Yes	Yes	Yes	Page 90
A3	View trace A	Yes	Yes	Yes	Yes	Page 91
A4	Blanks trace A	Yes	Yes	Yes	Yes	Page 92
ABORT	Interrupt operation of all user-defined functions	N/A	N/A	No	No	
ABS	Absolute	No	No	No	No	
ACP	Performs the adjacent channel power measurement	N/A	N/A	Yes	N/A	Page 93
ACPACCL	Accelerate adjacent channel power measurement	N/A	N/A	N/A	No	
ACPALPHA	Adjacent channel power alpha weighting	N/A	N/A	N/A	Yes	Page 94
ACPALTCH	Adjacent channel power alternate channels	N/A	N/A	N/A	Yes	Page 95
ACPBRPER	Adjacent channel power burst period	N/A	N/A	N/A	Yes	Page 96
ACPBRWID	Adjacent channel power burst width	N/A	N/A	N/A	Yes	Page 97
ACPBW	Specifies channel bandwidth for ACP measurement	N/A	N/A	Yes	Yes	Page 98
ACPCOMPUTE	Compute adjacent channel power	N/A	N/A	N/A	Yes	Page 99

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
ACPCONTM	Performs ACP measurement in continuous sweep	N/A	N/A	No	N/A	
ACPE	Adjacent channel power extended	N/A	N/A	No	N/A	
ACPERR	ACP measurement error query	N/A	N/A	No	N/A	
ACPFRQWT	Adjacent channel power frequency weighting	N/A	N/A	N/A	Yes	Page 100
ACPGR	Adjacent channel power graph on or off	N/A	N/A	No	N/A	
ACPGRAPH	Compute adjacent channel power graph	N/A	N/A	No	No	
ACPLOWER	Lower adjacent channel power	N/A	N/A	Yes	Yes	Page 101
ACPMAX	Maximum adjacent channel power	N/A	N/A	Yes	Yes	Page 102
ACPMEAS	Measure adjacent channel power	N/A	N/A	Yes	Yes	Page 103
ACPMETHOD	Adjacent channel power measurement method	N/A	N/A	N/A	No	
ACPMK	Adjacent channel power marker on or off	N/A	N/A	No	N/A	
ACPMSTATE	Adjacent channel power measurement state	N/A	N/A	Yes	Yes	Page 104
ACPPAR	ACP manual or auto	N/A	N/A	Yes	N/A	Page 105
ACPPWRTX	Total power transmitted	N/A	N/A	Yes	Yes	Page 106
ACPRSLTS	Adjacent channel power measurement results	N/A	N/A	Yes	Yes	Page 107
ACPSNGLM	Performs ACP measurement in single sweep	N/A	N/A	No	N/A	
ACPSP	Channel spacing	N/A	N/A	Yes	Yes	Page 108
ACPT	Adjacent channel power T weighting	N/A	N/A	N/A	Yes	Page 109

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
ACPUPPER	Upper adjacent channel power	N/A	N/A	Yes	Yes	Page 110
ACTDEF	Give user-defined function active status	N/A	N/A	No	N/A	
ACTVF	Active function	N/A	N/A	No	N/A	
ACTVFUNC	Creates a user defined active function	N/A	N/A	N/A	No	
ADD	Add	No	No	No	No	
ADJALL	LO & IF adjustment	N/A	N/A	N/A	Yes	Page 111
ADJCRT	Adjust CRT alignment	N/A	N/A	N/A	No	
ADJIF	Adjust IF	N/A	N/A	N/A	No	
AMB	Trace A – trace B -> trace A	Yes	Yes	Yes	Yes	Page 112
AMBPL	Trace A – trace B + Display Line -> trace A	Yes	Yes	Yes	Yes	Page 113
AMPCOR	Applies amplitude correction at specified frequencies	N/A	N/A	No	No	
AMPCORDATA	Amplitude correction data	N/A	N/A	N/A	No	
AMPCORSAVE	Save amplitude correction data	N/A	N/A	N/A	No	
AMPCORSIZE	Amplitude correction data array size	N/A	N/A	N/A	No	
AMPCORRCL	Amplitude correction recall	N/A	N/A	N/A	No	
AMPLEN	Amplitude correction length	N/A	N/A	No	N/A	
ANLGPLUS	Turns on or off the Analog+ display mode	N/A	N/A	No	N/A	
ANNOT	Display Annotation	Yes	Yes	Yes	Yes	Page 115
APB	Trace A + trace B -> trace A	Yes	Yes	Yes	Yes	Page 116
ARRAYDEF	Defines an array	N/A	N/A	N/A	No	
AT	Input Attenuation	Yes	Yes	Yes	Yes	Page 117
AUNITS	Amplitude Units	Yes	Yes	Yes	Yes	Page 119

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
AUTO	Auto couple	N/A	N/A	Yes	N/A	Page 121
AUTOCPL	Auto couple	N/A	N/A	N/A	Yes	Page 123
AUTOEXEC	Turns on or off the function defined with AUTOFUNC	N/A	N/A	N/A	No	
AUTOFUNC	Defines a function for automatic execution	N/A	N/A	N/A	No	
AUTOSAVE	Automatically saves trace	N/A	N/A	N/A	No	
AVG	Average	No	No	No	No	
AXB	Exchange Traces A & B	Yes	Yes	Yes	Yes	Page 124
B1	Clear-writes trace B	Yes	Yes	Yes	Yes	Page 125
B2	Max Holds trace B	Yes	Yes	Yes	Yes	Page 126
B3	View trace B	Yes	Yes	Yes	Yes	Page 127
B4	Blanks trace B	Yes	Yes	Yes	Yes	Page 128
BAUDRATE	Baud rate of spectrum analyzer	N/A	N/A	No	N/A	
BIT	Return or receive state of bit	N/A	N/A	No	N/A	
BITF	Bit flag	N/A	N/A	No	N/A	
BL	Trace B – Display line -> trace B	Yes	Yes	Yes	N/A	Page 129
BLANK	Blanks specified trace	Yes	Yes	Yes	Yes	Page 130
BML	Trace B – Display line -> trace B	Yes	Yes	Yes	Yes	Page 131
BRD	Bus Read	No	No	N/A	N/A	
BTC	Transfer trace B to C	Yes	Yes	Yes	N/A	Page 132
BWR	Bus Write	No	No	N/A	N/A	
BXC	Exchange Traces B & C	Yes	Yes	Yes	N/A	Page 133
C1	Turns off A - B	Yes	Yes	Yes	Yes	Page 134
C2	A – B -> A	Yes	Yes	Yes	Yes	Page 135
CA	Couples Attenuation	Yes	Yes	Yes	Yes	Page 136
CAL	Calibrate	N/A	N/A	Yes	N/A	Page 137

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
CARDLOAD	Copies data from memory card to module memory	N/A	N/A	N/A	No	
CARDSTORE	Copies data to memory card	N/A	N/A	N/A	No	
CARROFF	Carrier off power	N/A	N/A	N/A	No	
CARRON	Carrier on power	N/A	N/A	N/A	Yes	Page 138
CAT	Catalog	N/A	N/A	No	N/A	
CATALOG	Catalog	N/A	N/A	N/A	No	
CF	Center Frequency	Yes	Yes	Yes	Yes	Page 139
CHANNEL	Channel selection	N/A	N/A	N/A	Yes	Page 140
CHANPWR	Channel power	N/A	N/A	N/A	Yes	Page 141
CHP	Performs the channel power measurement	N/A	N/A	Yes	N/A	Page 142
CHPGR	Channel power graph on or off	N/A	N/A	No	N/A	
CHPWRBW	Channel power bandwidth	N/A	N/A	N/A	Yes	Page 143
CLRAVG	Reset avg. counter to 1	Yes	Yes	Yes	N/A	Page 144
CLRBOX	Clears a rectangular area on the analyzer display	N/A	N/A	No	N/A	
CLRDSP	Clear display	N/A	N/A	No	No	
CLRSCHED	Clears autosave & autoexec schedule buffer	N/A	N/A	N/A	No	
CLRW	Clear-writes specified trace	Yes	Yes	Yes	Yes	Page 145
CLS	Clear status byte	N/A	N/A	Yes	N/A	Page 146
CMDERRQ	Command error query	N/A	N/A	No	N/A	
CNF	Confidence test	N/A	N/A	No	N/A	
CNTLA	Auxiliary interface control line A	N/A	N/A	No	No	
CNTLB	Auxiliary interface control line B	N/A	N/A	No	No	
CNTLC	Auxiliary interface control line C	N/A	N/A	No	No	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
CNTLD	Auxiliary interface control line D	N/A	N/A	No	No	
CNTLI	Auxiliary interface control line input	N/A	N/A	No	No	
CNVLOSS	Selects ref level offset to calibrate amplitude display	No	N/A	N/A	No	
COMB	Turns the comb generator on or off	N/A	N/A	No	N/A	
COMPRESS	Compress	No	No	No	N/A	
CONCAT	Concat	No	No	No	N/A	
CONTS	Continuous sweep mode	Yes	Yes	Yes	Yes	Page 147
CORREK	Correction factors on	N/A	N/A	Yes	N/A	Page 148
COUPLE	Selects AC or DC coupling	N/A	N/A	Yes	Yes	Page 149
CR	Couples Resolution BW	Yes	Yes	Yes	Yes	Page 150
CRTHPOS	Horizontal position of CRT display	N/A	N/A	No	N/A	
CRTVPOS	Vertical position of CRT display	N/A	N/A	No	N/A	
CS	Couples Step Size	Yes	Yes	Yes	Yes	Page 151
CT	Couples Sweep Time	Yes	Yes	Yes	Yes	Page 152
CTA	Converts display units to dBm	No	No	No	N/A	
CTM	Converts dBm to display units	No	No	No	N/A	
CTRLHPIB	Allows SA to control HP-IB	N/A	N/A	N/A	No	
CV	Couples Video Bandwidth	Yes	Yes	Yes	Yes	Page 153
D1	Sets display to normal size	No	No	N/A	N/A	
D2	Sets display to full CRT size	No	No	N/A	N/A	
D3	Sets display to expanded size	No	No	N/A	N/A	
DA	Display Memory Address	Yes	Yes	Yes	N/A	Page 154
DATEMODE	Set the date display format	N/A	N/A	No	No	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
DD	Display write binary	No	No	N/A	N/A	
DELMKBW	Occupied power bandwidth within delta marker	N/A	N/A	N/A	Yes	Page 155
DEMOD	Turns the demodulator on or off	N/A	N/A	No	No	
DEMODAGC	Demodulation automatic gain control	N/A	N/A	N/A	No	
DEMODT	Demodulation time	N/A	N/A	N/A	No	
DET	Detection Mode	Yes	Yes	Yes	Yes	Page 156
DISPOSE	Frees Memory	No	No	No	No	
DIV	Divide	No	No	No	No	
DL	Display Line Level	Yes	Yes	Yes	Yes	Page 158
DLE	Turns the display line on/off	Yes	Yes	N/A	N/A	Page 160
DLYSWP	Delay sweep	N/A	N/A	N/A	Yes	Page 161
DN	Reduces the active function by applicable step size	N/A	N/A	No	N/A	
DONE	Synchronizing function	Yes	Yes	Yes	Yes	Page 162
DOTDENS	Sets the dot density value in Analog+ display mode	N/A	N/A	No	N/A	
DR	Display Memory Address Read	No	No	N/A	N/A	
DRAWBOX	Draws a rectangular box on analyzer display	N/A	N/A	No	N/A	
DSPLY	Display	No	No	No	No	
DT	Define Terminator	No	No	No	N/A	
DW	Display Memory Address Write	No	No	N/A	N/A	
E1	Active marker to maximum signal	Yes	Yes	Yes	Yes	Page 163
E2	Active marker to center frequency	Yes	Yes	Yes	Yes	Page 164
E3	Active marker frequency to CF step size	Yes	Yes	Yes	Yes	Page 165

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
E4	Active marker to reference level	Yes	Yes	Yes	Yes	Page 166
EDITDONE	Indicates limit line editing is complete	N/A	N/A	N/A	Yes	Page 167
EDITLIML	Allows current limit line to be edited	N/A	N/A	N/A	Yes	Page 168
EE	Enable entry	No	No	No	N/A	
EK	Enable knob	No	No	No	N/A	
ELSE	Conditional Programming (If…then…else…endif)	No	No	N/A	No	
EM	Erase trace C memory	No	No	No	No	
ENDIF	Conditional Programming (If…then…else…endif)	No	No	N/A	N/A	
ENTER	Enter from HP-IB	No	No	No	No	
EP	Enter parameter function	N/A	N/A	No	N/A	
ERASE	User memory & registers erased	No	No	No	N/A	
ERR	Queries the error queue	Yes	Yes	N/A	Yes	Page 169
ET	Elapsed time	N/A	N/A	N/A	Yes	Page 170
EX	Exchanges trace A & B	Yes	Yes	Yes	Yes	Page 171
EXP	Exponential	No	No	No	No	
EXTMXR	Presets external mixing mode	No	N/A	N/A	No	
FA	Start frequency	Yes	Yes	Yes	Yes	Page 172
FB	Stop frequency	Yes	Yes	Yes	Yes	Page 173
FDIAG	Frequency diagnostics	N/A	N/A	N/A	No	
FDSP	Frequency display off	N/A	N/A	N/A	Yes	Page 174
FFT	Fast fourier transform	No	No	No	No	
FFTAUTO	Marker to Auto FFT	N/A	N/A	No	N/A	
FFTCLIP	FFT signal clipped	N/A	N/A	No	N/A	
FFTCONTS	FFT continuous sweep	N/A	N/A	No	N/A	

Legacy Analyzer Command List

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
FFTKNL	Fast fourier transform kernel	No	No	N/A	N/A	
FFTMKR	FFT markers	N/A	N/A	No	N/A	
FFTMM	FFT marker to midscreen	N/A	N/A	No	N/A	
FFTMS	FFT marker to FFT stop frequency	N/A	N/A	No	N/A	
FFTOFF	FFT off	N/A	N/A	No	N/A	
FFTPCTAM	FFT percent amplitude modulation	N/A	N/A	No	N/A	
FFTPCTAMR	FFT percent amplitude modulation readout	N/A	N/A	No	N/A	
FFTSNGLS	FFT single sweep	N/A	N/A	No	N/A	
FFTSTAT	FFT status	N/A	N/A	No	N/A	
FFTSTOP	FFT stop frequency	N/A	N/A	No	N/A	
FMGAIN	FM gain	N/A	N/A	No	N/A	
FOFFSET	Frequency offset	Yes	Yes	Yes	Yes	Page 175
FORMAT	Erase & format the selected memory device	N/A	N/A	No	No	
FPKA	Fast preselector peak	Yes	N/A	N/A	N/A	Page 176
FREF	Frequency reference	N/A	N/A	N/A	Yes	Page 177
FS	Full frequency span	Yes	Yes	Yes	Yes	Page 178
FULBAND	Set start/stop freq for ext mixing bands	No	N/A	N/A	No	
FUNCDEF	Function definition	No	No	No	No	
GATE	Turn time-gating on or off	N/A	N/A	No	No	
GATECTL	Gate control	N/A	N/A	No	No	
GC	Gate preset	N/A	N/A	No	N/A	
GD	Gate delay	N/A	N/A	No	No	
GDRVCLPAR	Clear pulse parameters	N/A	N/A	No	N/A	
GDRVGDEL	Gate Delay for the frequency window	N/A	N/A	No	N/A	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
GDRVGLEN	Gate length for frequency & time windows	N/A	N/A	No	N/A	
GDRVGT	Turns gate in frequency window on or off	N/A	N/A	No	N/A	
GDRVGTIM	Gate trigger to marker position for time window	N/A	N/A	No	N/A	
GDRVPRI	Pulse repetition interval	N/A	N/A	No	N/A	
GDRVPWID	Pulse width	N/A	N/A	No	N/A	
GDRVRBW	Couple resolution bandwidth to pulse width	N/A	N/A	No	N/A	
GDRVREFE	Enter reference edge	N/A	N/A	No	N/A	
GDRVST	Couple sweep time to pulse repetition interval	N/A	N/A	No	N/A	
GDRVSWAP	Update the time or frequency window	N/A	N/A	No	N/A	
GDRVSWDE	Delay sweep for time window	N/A	N/A	No	N/A	
GDRVSWP	Sweep time for the time window	N/A	N/A	No	N/A	
GDRVUTIL	Turns the gate utility on or off	N/A	N/A	No	N/A	
GDRVVBW	Couple video bandwidth to the gate length	N/A	N/A	No	N/A	
GETPLOT	Get plot	N/A	N/A	No	N/A	
GETPRNT	Get print	N/A	N/A	No	N/A	
GL	Gate length	N/A	N/A	No	No	
GP	Sets the polarity (positive/negative) of the gate trigger	N/A	N/A	No	No	
GR	Plot GPIB input as Graphs	No	No	No	N/A	
GRAT	Graticule on/off	Yes	Yes	Yes	Yes	Page 180
HAVE	Checks for options installed	N/A	N/A	No	N/A	
HD	Holds data entry	No	No	Yes	No	Page 181

Legacy Analyzer Command List

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
HN	Harmonic number	N/A	N/A	No	N/A	
HNLOCK	Harmonic lock	No	N/A	No	No	
HNUNLK	Harmonic band unlock	No	N/A	No	No	
IB	Input to trace B memory	No	No	No	N/A	
I1	Sets the RF coupling to AC	N/A	Yes	N/A	N/A	Page 182
I2	Sets the RF coupling to DC	N/A	Yes	N/A	N/A	Page 183
ID	Instrument identification	Yes	Yes	Yes	Yes	Page 184
IDCF	Identified signal to center frequency	N/A	N/A	N/A	No	
IDFREQ	Identified signal frequency	N/A	N/A	N/A	No	
IDSTAT	Signal identifier status	No	N/A	N/A	N/A	
IF	Conditional Programming (If…then…else…endif)	No	No	No	No	
IFTKNL	16 bit discrete fourier transform	No	No	N/A	N/A	
INT	Integer	No	No	No	No	
INZ	Input impedance	N/A	N/A	No	N/A	
IP	Instrument preset	Yes	Yes	Yes	Yes	Page 185
KEYCLR	Clear user defined keys	N/A	N/A	No	No	
KEYCMD	Define function & label of softkey	N/A	N/A	No	N/A	
KEYDEF	Assign function to soft key	No	No	No	No	
KEYENH	Key enhance	N/A	N/A	No	N/A	
KEYEXC	Executes specified soft key	No	No	No	N/A	
KEYLBL	Relabels softkey without changing its function	N/A	N/A	No	N/A	
KS,	Mixer level	Yes	Yes	N/A	N/A	Page 186
KS=	HP8566: Selects factory preselector setting HP8568: Marker counter frequency resolution	No	Yes	No	No	Page 187
KS(	Locks the save registers	No	No	N/A	N/A	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
KS)	Unlocks the save registers	No	No	N/A	N/A	
KS>	Specifies preamp gain for signal input 2	N/A	No	N/A	N/A	
KS<	Specifies preamp gain for signal input 1	N/A	No	N/A	N/A	
KS|	Display memory address write	No	No	N/A	N/A	
KS#	Turns off YTX self-heating correction	No	N/A	N/A	N/A	
KS/	Allows preselector to be peaked manually	No	N/A	N/A	N/A	
KS123	Returns up to 1001 words display memory	No	No	N/A	N/A	
KS125	Writes up to 1001 display memory words	No	No	N/A	N/A	
KS126	Returns every Nth value of a trace	No	No	N/A	N/A	
KS127	Sets analyzer to accept binary display write	No	No	N/A	N/A	
KS39	Writes display memory address in fast binary	No	No	N/A	N/A	
KS43	Sets SRQ 102 when frequency limit exceeded	No	No	N/A	N/A	
KS91	Returns the amplitude error	No	No	N/A	N/A	
KS92	Specifies value DL, TH, active mkr in display units	No	No	N/A	N/A	
KS94	Returns code for harmonic number in binary	No	No	N/A	N/A	
KSA	Sets amplitude units to dBm	Yes	Yes	Yes	N/A	Page 188
KSa	Selects normal detection	Yes	Yes	N/A	N/A	Page 189
KSB	Sets amplitude units to dBmV	Yes	Yes	Yes	N/A	Page 190

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
KSb	Selects positive peak detection	Yes	Yes	N/A	N/A	Page 191
KSC	Sets amplitude units to dBuV	Yes	Yes	Yes	N/A	Page 192
KSc	Trace A + trace B -> trace A	Yes	Yes	Yes	N/A	Page 193
KSD	Sets amplitude units to V	Yes	Yes	Yes	N/A	Page 194
KSd	Selects negative peak detection	Yes	Yes	N/A	N/A	Page 195
KSE	Sets the analyzer title mode	Yes	Yes	Yes	N/A	Page 196
KSe	Selects sample detection	Yes	Yes	N/A	N/A	Page 197
KSF	HP8566: Shifts the YTO HP8568: Measures the Sweep Time	No	No	N/A	N/A	
KSf	Recover last instrument state at power on	No	No	N/A	N/A	
KSG	Turns on video averaging	Yes	Yes	Yes	N/A	Page 198
KSg	Turns off the display	Yes	Yes	N/A	N/A	Page 199
KSH	Turns off video averaging	Yes	Yes	Yes	N/A	Page 200
KSh	Turns on the display	Yes	Yes	N/A	N/A	Page 201
KSI	Allows the reference level to be extended	No	No	N/A	N/A	Page 202
KSi	Exchanges traces B & C	Yes	Yes	Yes	N/A	Page 203
KSJ	Manual control of DACs	No	No	N/A	N/A	
KSj	Views trace C	Yes	Yes	N/A	N/A	Page 204
KSK	HP8566: Active Mkr to next highest peak HP8568: Counts pilot IF at marker	Yes	No	N/A	N/A	Page 205
KSk	Blanks trace C	Yes	Yes	N/A	N/A	Page 206
KSL	Turns off marker noise function	Yes	Yes	N/A	N/A	Page 207
KSl	Moves trace B into trace C	Yes	Yes	Yes	N/A	Page 208

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
KSM	Turns on marker noise function	Yes	Yes	Yes	N/A	Page 209
KSm	Turns off the graticule	Yes	Yes	Yes	N/A	Page 211
KSN	Marker minimum value detected	Yes	No	N/A	N/A	Page 212
KSn	Turns on the graticule	Yes	Yes	Yes	N/A	Page 213
KSO	Marker span	Yes	Yes	Yes	N/A	Page 214
KSo	Turns off the annotation	Yes	Yes	Yes	N/A	Page 215
KSP	GPIB address	No	No	N/A	N/A	
KSp	Turns on the annotation	Yes	Yes	Yes	N/A	Page 216
KSQ	Unlocks frequency band	No	No	N/A	N/A	
KSq	Decouples IF gain and input attenuation	No	No	N/A	N/A	
KSR	Turns on service diagnostics	No	No	N/A	N/A	
KSr	Sets service request 102	No	No	N/A	N/A	
KSS	HP8566: Fast GPIB operation HP8568: Determine second LO frequency	No	No	N/A	N/A	
KST	HP8566: Fast preset HP8568: Shifts second LO down	Yes	No	N/A	N/A	Page 217
KSt	HP8566: Locks frequency band HP8568: Continues sweep from marker	No	No	N/A	N/A	
KSU	HP8566: External mixer preset HP8568: Shift second LO up	No	No	N/A	N/A	
KSu	Stops the sweep at the active marker	No	No	N/A	N/A	
KSV	Frequency offset	Yes	Yes	N/A	N/A	Page 218

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
KSv	HP8566: External mixer frequency identifier HP8568: Inhibits phase lock	No	No	N/A	N/A	
KSW	Amplitude error correction routine	No	No	N/A	N/A	
KSw	Displays amplitude error correction routine	No	No	N/A	N/A	
KSX	Amplitude correction factors on	No	No	N/A	N/A	
KSx	Sets trigger mode to external	Yes	Yes	N/A	N/A	Page 219
KSY	Amplitude correction factors off	No	No	N/A	N/A	
KSy	Sets trigger mode to video	Yes	Yes	N/A	N/A	Page 220
KSZ	Reference level offset	Yes	Yes	Yes	N/A	Page 221
KSz	Sets the display storage address	No	No	N/A	N/A	
L0	Turns off the display line	Yes	Yes	Yes	Yes	Page 222
LB	Writes text label	No	No	No	No	
LCLVAR	Defines a local variable for use	N/A	N/A	N/A	No	
LF	Preset 0–2.5GHz	Yes	N/A	Yes	N/A	Page 223
LG	Selects log scale	Yes	Yes	Yes	Yes	Page 224
LIMD	Delta amplitude value for limit line segment	N/A	N/A	N/A	Yes	Page 226
LIMF	Frequency value for limit-line segment	N/A	N/A	N/A	Yes	Page 227
LIMIDEL	Erase contents of limit line table	N/A	N/A	Yes	N/A	Page 228
LIMIDISP	Controls when the limit line(s) are displayed	N/A	N/A	Yes	N/A	Page 229
LIMIFAIL	Limit line fail	N/A	N/A	Yes	Yes	Page 230

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
LIMIFT	Select frequency or time limit line	N/A	N/A	Yes	N/A	Page 231
LIMIHI	Upper limit	N/A	N/A	No	N/A	
LIMILINE	Limit line	N/A	N/A	No	N/A	
LIMILO	Lower limit	N/A	N/A	No	N/A	
LIMIMIRROR	Mirror limit line	N/A	N/A	No	N/A	
LIMIMODE	Limit line entry mode	N/A	N/A	No	N/A	
LIMIPURGE	Disposes of current limit line, not limit line table	N/A	N/A	N/A	Yes	Page 232
LIMIRCL	Load stored limit line into limit line table	N/A	N/A	N/A	No	
LIMIREL	Determine whether limit line values absolute/relative	N/A	N/A	Yes	Yes	Page 233
LIMISAV	Save contents of limit line table for recall	N/A	N/A	N/A	No	
LIMISEG	Define slope & offset of limit line segments	N/A	N/A	No	N/A	
LIMISEGT	Enter limit line segment for sweep time	N/A	N/A	No	N/A	
LIMITEST	Compare active trace data to limit line parameters	N/A	N/A	Yes	Yes	Page 234
LIML	Amplitude value for limit line segment in lower limit line	N/A	N/A	N/A	Yes	Page 235
LIMM	Middle amplitude value for limit-line segment	N/A	N/A	N/A	Yes	Page 236
LIMTFL	Specifies a flat limit-line segment	N/A	N/A	N/A	No	
LIMTSL	Specifies a sloped limit-line segment	N/A	N/A	N/A	No	
LIMU	Amplitude value for limit line segment in upper limit line	N/A	N/A	N/A	Yes	Page 237
LINFILL	Line fill	N/A	N/A	No	N/A	

Legacy Analyzer Command List

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their Option 266 Support**

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
LL	Provides lower left recorder output voltage at rear	No	No	N/A	N/A	
LN	Selects linear scale	Yes	Yes	Yes	Yes	Page 238
LOAD	Load article/file into internal memory	N/A	N/A	No	N/A	
LOG	Log	No	No	No	No	
LOLIMOFF	LO Limit Off	No	No	N/A	N/A	
LSPAN	Last span	N/A	N/A	Yes	N/A	Page 239
M1	Turns off all markers	Yes	Yes	Yes	Yes	Page 240
M2	Marker Normal	Yes	Yes	Yes	Yes	Page 241
M3	Marker Delta	Yes	Yes	Yes	Yes	Page 242
M4	Marker zoom	Yes	Yes	Yes	N/A	Page 244
MA	Returns the amplitude of active marker	Yes	Yes	Yes	Yes	Page 245
MBIAS	Mixer bias	N/A	N/A	N/A	No	
MBRD	Processor memory block read	No	No	N/A	N/A	
MBWR	Processor memory block write	No	No	N/A	N/A	
MC0	Turns off the marker frequency counter	N/A	Yes	Yes	N/A	Page 246
MC1	Turns on the marker frequency counter	N/A	Yes	Yes	N/A	Page 247
MDS	Measurement data size	Yes	Yes	Yes	N/A	Page 248
MDU	Measurement data units	No	No	No	N/A	
MEAN	Returns mean value of trace in display units	Yes	Yes	Yes	Yes	Page 249
MEANPWR	Mean power measurement	N/A	N/A	N/A	Yes	Page 250
MEANTH	Trace mean above threshold	N/A	N/A	No	N/A	
MEAS	Measurement status	N/A	N/A	N/A	No	
MEASOFF	Measurement off	N/A	N/A	Yes	N/A	Page 251
MEASURE	Measure mode	N/A	N/A	No	N/A	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
MEM	Returns amount of memory available	No	No	No	No	
MENU	Menu	N/A	N/A	No	No	
MERGE	Merge two traces	No	No	No	N/A	
MF	Returns frequency of the active marker	Yes	Yes	Yes	Yes	Page 252
MIN	Minimum	No	No	No	No	
MINH	Min Hold	N/A	N/A	Yes	Yes	Page 253
MINPOS	Returns the minimum position in the trace	Yes	Yes	Yes	N/A	Page 254
MIRROR	Mirror image of the trace	No	No	No	N/A	
MKA	Amplitude of the active marker	Yes	Yes	Yes	Yes	Page 255
MKACT	Specifies the active marker	Yes	Yes	Yes	N/A	Page 256
MKACTV	Marker as the active function	N/A	N/A	No	N/A	
MKBW	Marker bandwidth	N/A	N/A	Yes	Yes	Page 257
MKCF	Moves the active marker to center frequency	Yes	Yes	Yes	Yes	Page 258
MKCHEDGE	Marker to channel edge	N/A	N/A	N/A	No	
MKCONT	Continues sweeping from the marker after stop	No	No	No	N/A	
MKD	Delta marker	Yes	Yes	Yes	Yes	Page 259
MKDELCHBW	Delta markers to channel power bandwidth	N/A	N/A	N/A	No	
MKDLMODE	Marker delta display line mode	N/A	N/A	No	N/A	
MKDR	Reciprocal of marker delta	N/A	N/A	N/A	No	
MKF	Specifies the frequency of the active marker	Yes	Yes	Yes	Yes	Page 261
MKFC	Turns the marker frequency counter on or off	N/A	Yes	Yes	Yes	Page 262

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
MKFCR	Specifies the marker frequency counter resolution	N/A	Yes	Yes	Yes	Page 263
MKMCF	Marker mean to center frequency	N/A	N/A	N/A	No	
MKMIN	Moves active marker to minimum signal detected	Yes	Yes	Yes	Yes	Page 264
MKN	Normal marker	Yes	Yes	Yes	Yes	Page 265
MKNOISE	Marker noise function	Yes	Yes	Yes	Yes	Page 266
MKOFF	Turns all markers or the active marker off	Yes	Yes	Yes	Yes	Page 268
MKP	Specifies the horizontal position of the marker	Yes	Yes	Yes	N/A	Page 269
MKPAUSE	Pauses the sweep at the active marker	No	No	No	N/A	
MKPK	Marker peak	Yes	Yes	Yes	Yes	Page 270
MKPT	Marker peak threshold	N/A	N/A	N/A	Yes	Page 271
MKPX	Marker peak excursion	Yes	Yes	Yes	Yes	Page 272
MKREAD	Specifies marker readout mode	Yes	Yes	Yes	N/A	Page 273
MKRL	Moves the active marker to reference level	Yes	Yes	Yes	Yes	Page 275
MKSP	Marker span	Yes	Yes	Yes	Yes	Page 276
MKSS	Marker step size	Yes	Yes	Yes	Yes	Page 277
MKSTOP	Stops the sweep at the active marker	No	No	No	N/A	
MKT	Position marker in units of time	N/A	N/A	N/A	Yes	Page 278
MKTBL	Marker table	N/A	N/A	No	N/A	Page 279
MKTRACE	Marker trace	Yes	Yes	Yes	N/A	Page 280
MKTRACK	Turns the marker signal track on or off	Yes	Yes	Yes	Yes	Page 281
MKTYPE	Specifies the type of active marker to be used	Yes	Yes	No	N/A	Page 282

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their Option 266 Support**

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
ML	Mixer Level	Yes	Yes	Yes	Yes	Page 283
MOD	Modulo	No	No	No	No	
MODE	Mode of operation	N/A	N/A	No	N/A	
MODRCLT	Recalls trace from module memory	N/A	N/A	N/A	No	
MODSAVT	Saves trace in module memory	N/A	N/A	N/A	No	
MOV	Move	No	No	No	No	
MPY	Multiply	No	No	No	No	
MRD	Memory Read	No	No	N/A	N/A	
MRDB	Memory read byte	No	No	N/A	N/A	
MSDEV	Specifies mass storage device	N/A	N/A	N/A	No	
MSI	Mass storage interface	N/A	N/A	No	N/A	
MT0	Turns off marker signal track	Yes	Yes	Yes	Yes	Page 285
MT1	Turns on marker signal track	Yes	Yes	Yes	Yes	Page 286
MWR	Memory Write	No	No	N/A	N/A	
MWRB	Memory write byte	No	No	N/A	N/A	
MXM	Maximum	No	No	No	No	
MXMH	Max Hold	Yes	Yes	Yes	Yes	Page 287
MXRMODE	Mixer mode	N/A	N/A	N/A	No	
NDB	Number of dB	N/A	N/A	No	N/A	
NDBPNT	Turns the N dB points function on or off	N/A	N/A	No	N/A	
NDBPNTR	N dB points bandwidth	N/A	N/A	No	N/A	
NORMLIZE	Normalize trace data	N/A	N/A	N/A	No	
NRL	Normalized reference level	N/A	N/A	No	No	
NRPOS	Normalized reference position	N/A	N/A	N/A	No	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
NSTART	Start harmonic	No	N/A	N/A	N/A	
NSTOP	Stop harmonic	No	N/A	N/A	N/A	
O1	Output format	Yes	Yes	Yes	N/A	Page 288
O2	Output format	Yes	Yes	Yes	N/A	Page 289
O3	Output format	Yes	Yes	Yes	N/A	Page 290
O4	Output format	Yes	Yes	Yes	N/A	Page 291
OA	Returns the active function value	N/A	N/A	No	N/A	
OBW	Occupied bandwidth	N/A	N/A	No	N/A	
OBWBW	Bandwidth measured by occupied bandwidth	N/A	N/A	No	N/A	
OBWFERR	Occupied bandwidth transmit frequency error	N/A	N/A	No	N/A	
OBWLOWER	Relative lower frequency limit of occupied bandwidth	N/A	N/A	No	N/A	
OBWPCT	Occupied bandwidth percent	N/A	N/A	No	N/A	
OBWPWR	Total power in the occupied bandwidth	N/A	N/A	No	N/A	
OBWUPPER	Relative upper frequency limit of occupied bandwidth	N/A	N/A	No	N/A	
OCCUP	Percent occupied power bandwidth	N/A	N/A	N/A	Yes	Page 292
OL	Output learn string	Yes	Yes	No	N/A	Page 293
ONCYCLE	On cycle	N/A	N/A	No	N/A	
ONDELAY	On delay	N/A	N/A	No	N/A	
ONEOS	On end of sweep	No	No	No	No	
ONMKR	On marker pause	N/A	N/A	No	N/A	
ONMKRU	On marker update	N/A	N/A	No	N/A	
ONPWRUP	On power up	N/A	N/A	No	N/A	
ONSRQ	On service request	N/A	N/A	No	N/A	
ONSWP	On sweep	No	No	No	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their Option 266 Support**

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
ONTIME	On time	N/A	N/A	No	N/A	
OP	Output parameters	No	No	No	No	
OR	Set position of origin	N/A	N/A	N/A	No	
OT	Output trace annotations	Yes	Yes	N/A	N/A	Page 294
OUTPUT	Output - sending data to the GPIB from function	No	No	No	No	
PA	Plot absolute	No	No	No	No	
PARSTAT	Parallel status	N/A	N/A	No	N/A	
PCTAM	Turns the percent AM measurement on or off	N/A	N/A	No	N/A	
PCTAMR	Percent AM response	N/A	N/A	No	N/A	
PD	Pen down	No	No	No	No	
PDA	Probability distribution amplitude	No	No	No	No	
PDF	Probability distribution frequency	No	No	No	No	
PEAKS	Sorts the signal peaks by amplitude/frequency	Yes	Yes	Yes	Yes	Page 295
PKDLMODE	Peak table delta display line mode	N/A	N/A	No	N/A	
PKPOS	Peak position	Yes	Yes	Yes	N/A	Page 296
PKRES	Peak result	N/A	N/A	No	N/A	
PKSORT	Selects how to sort signal peaks listed in peak table	N/A	N/A	No	N/A	
PKTBL	Turns the peak table on or off	N/A	N/A	No	N/A	
PKZMOK	Peak zoom okay	N/A	N/A	No	N/A	
PKZOOM	Peak zoom	N/A	N/A	No	N/A	
PLOT	Prints the screen	Yes	Yes	Yes	Yes	Page 297
PLOTORG	Display origins	N/A	N/A	N/A	No	
PLOTSRC	Plot source	N/A	N/A	N/A	No	
PLTPRT	Plot port	N/A	N/A	No	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their Option 266 Support**

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
POWERON	Power on state	N/A	N/A	No	N/A	
PP	Peaks the preselector	Yes	N/A	Yes	Yes	Page 298
PR	Plot relative	No	No	No	No	
PREAMPG	External preamplifier gain	N/A	N/A	Yes	N/A	Page 299
PREFX	Change user memory entries file prefix	N/A	N/A	No	N/A	
PRINT	Print	N/A	N/A	Yes	Yes	Page 300
PRNPRT	Print port	N/A	N/A	No	N/A	
PRNTADRS	Print address	N/A	N/A	No	N/A	
PS	Skip page	No	No	N/A	N/A	
PSDAC	Preselector DAC number	N/A	N/A	N/A	No	
PSTATE	Protect state	N/A	N/A	No	No	
PU	Pen up	No	No	No	No	
PURGE	Purge file	N/A	N/A	No	N/A	
PWRBW	Power bandwidth	Yes	Yes	Yes	Yes	Page 301
PWRUPTIME	Power up time	N/A	N/A	Yes	N/A	Page 302
Q0	Sets detector to EMI Peak detection	Yes	Yes	N/A	N/A	Page 303
Q1	Sets detector to Quasi Peak detection	Yes	Yes	N/A	N/A	Page 304
R1	Resets service request 140	Yes	Yes	Yes	N/A	Page 305
R2	Allows service request 140 & 104	Yes	Yes	Yes	N/A	Page 306
R3	Allows service request 140 & 110	Yes	Yes	Yes	N/A	Page 307
R4	Allows service request 140 & 102	Yes	Yes	Yes	N/A	Page 308
RB	Resolution bandwidth	Yes	Yes	Yes	Yes	Page 309
RBR	Resolution bandwidth/Span ratio	N/A	N/A	N/A	Yes	Page 311
RC	Recalls state register	Yes	Yes	Yes	Yes	Page 312

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
RCLOSCAL	Recall open/short average	N/A	N/A	N/A	No	
RCLS	Recall state	Yes	Yes	Yes	Yes	Page 313
RCLT	Recall trace	N/A	N/A	No	No	
RCLTHRU	Recall internal thru-reference trace into trace B	N/A	N/A	N/A	No	
RELHPIB	Release control of GPIB	N/A	N/A	No	No	
REPEAT	Conditional Programming (Repeat .. Until …)	No	No	No	No	
RESETRL	Reset reference level	N/A	N/A	No	N/A	
RETURN	Return to user defined function origination point	N/A	N/A	No	No	
REV	Returns the revision string to the controller	Yes	Yes	Yes	Yes	Page 314
RL	Reference level	Yes	Yes	Yes	Yes	Page 315
RLCAL	Reference level calibration	N/A	N/A	N/A	No	
RLPOS	Reference level position	N/A	N/A	No	N/A	
RMS	Root mean square	Yes	Yes	Yes	Yes	Page 317
ROFFSET	Reference level offset	Yes	Yes	Yes	Yes	Page 318
RQS	SRQ mask	Yes	Yes	Yes	Yes	Page 319
S1	Continuous sweep mode	Yes	Yes	Yes	Yes	Page 320
S2	Single sweep mode	Yes	Yes	Yes	Yes	Page 321
SADD	Adds a limit line segment	N/A	N/A	N/A	Yes	Page 322
SAVEMENU	Save menu	N/A	N/A	No	N/A	
SAVES	Saves analyzer state to specified register	Yes	Yes	Yes	Yes	Page 323
SAVET	Save trace	N/A	N/A	No	No	
SAVRCLF	Save or recall flag	N/A	N/A	No	N/A	
SAVRCLN	Save or recall number	N/A	N/A	No	N/A	
SAVRCLW	Save or recall data	N/A	N/A	No	N/A	
SDEL	Deletes a limit line segment	N/A	N/A	N/A	Yes	Page 324

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
SDON	Indicates limit line segment is done	N/A	N/A	N/A	Yes	Page 325
SEDI	Edits limit line segment	N/A	N/A	N/A	Yes	Page 326
SEGDEL	Delete specified segment from limit line tables	N/A	N/A	No	N/A	
SENTER	Segment entry for frequency limit lines	N/A	N/A	Yes	No	Page 327
SENTERT	Segment entry for sweep time limit lines	N/A	N/A	No	N/A	
SER	Serial number	N/A	N/A	Yes	Yes	Page 328
SETDATE	Set the date of spectrum analyzer	N/A	N/A	Yes	Yes	Page 329
SETTIME	Set the time of spectrum analyzer	N/A	N/A	Yes	Yes	Page 330
SHOWMENU	Shows menu	N/A	N/A	N/A	No	
SIGDEL	Signal amplitude delta	No	N/A	N/A	N/A	
SIGID	External mixing frequency bands signal identifier	No	N/A	N/A	No	
SKYCLR	Clears user softkey	N/A	N/A	N/A	No	
SKYDEF	Defines user softkey	N/A	N/A	N/A	No	
SMOOTH	Smooths given trace over specified number points	Yes	Yes	Yes	Yes	Page 331
SNGLS	Single sweep mode	Yes	Yes	Yes	Yes	Page 332
SP	Frequency Span	Yes	Yes	Yes	Yes	Page 333
SPEAKER	Turns the internal speaker on or off	N/A	N/A	No	N/A	
SPZOOM	Span Zoom	N/A	N/A	No	N/A	
SQLCH	Sets the squelch threshold	N/A	N/A	No	N/A	
SQR	Square root	No	No	No	No	
SQUELCH	Adjusts squelch level	N/A	N/A	N/A	No	
SRCALC	Selects internal or external level control	N/A	N/A	No	No	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
SRCAT	Attenuate source output level	N/A	N/A	No	N/A	
SRCCRSTK	Coarse tracking adjust	N/A	N/A	N/A	No	
SRCFINTK	Fine tracking adjust	N/A	N/A	N/A	No	
SRCNORM	Source normalization	N/A	N/A	No	N/A	
SRCPOFS	Offset source power level	N/A	N/A	No	No	
SRCPSTP	Select source power step size	N/A	N/A	No	No	
SRCPSWP	Select sweep range of source output	N/A	N/A	No	No	
SRCPWR	Select source power level	N/A	N/A	No	No	
SRCTK	Adjust tracking of source output with SA sweep	N/A	N/A	No	N/A	
SRCTKPK	Auto adjust tracking of source output with SA sweep	N/A	N/A	No	No	
SRQ	Service request	Yes	Yes	Yes	Yes	Page 335
SS	Frequency Step Size	Yes	Yes	Yes	Yes	Page 336
ST	Sweep Time	Yes	Yes	Yes	Yes	Page 338
STB	Status byte query	N/A	N/A	Yes	Yes	Page 340
STDEV	Standard deviation of trace amplitude	Yes	Yes	Yes	Yes	Page 341
STOR	Store file	N/A	N/A	No	N/A	
STOREOPEN	Save current instrument state	N/A	N/A	N/A	No	
STORESHORT	Store short	N/A	N/A	N/A	No	
STORETHRU	Store thru-calibration trace in trace B	N/A	N/A	N/A	No	
SUB	Subtract	No	No	No	No	
SUM	Sum of trace element amplitudes in display units	No	No	No	No	
SUMSQR	Squares trace element amplitudes & returns sum	No	No	No	No	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
SV	Saves state	Yes	Yes	Yes	Yes	Page 343
SW	Skip to next control instruction	No	No	N/A	N/A	
SWPCPL	Sweep couple	N/A	N/A	No	No	
SWPOUT	Sweep output	N/A	N/A	N/A	No	
SYNCMODE	Synchronize mode	N/A	N/A	No	N/A	
T0	Turns the threshold level off	No	No	No	N/A	
T1	Sets the trigger mode to free run	Yes	Yes	Yes	Yes	Page 344
T2	Sets the trigger mode to line	Yes	Yes	Yes	Yes	Page 345
T3	Sets the trigger mode to external	Yes	Yes	Yes	Yes	Page 346
T4	Sets the trigger mode to video	Yes	Yes	Yes	Yes	Page 347
T7	Sets the trigger mode to level	N/A	N/A	No	N/A	
T8	Sets the trigger mode to edge	N/A	N/A	No	N/A	
TA	Returns trace A amplitude values to controller	Yes	Yes	Yes	Yes	Page 348
TB	Returns trace B amplitude values to controller	Yes	Yes	Yes	Yes	Page 349
TDF	Trace data format	Yes	Yes	Yes	Yes	Page 350
TEXT	Writes text on the analyzer screen	No	No	No	No	
TH	Threshold	Yes	Yes	Yes	Yes	Page 351
THE	Turns the threshold on or off	No	No	N/A	N/A	
THEN	Conditional Programming (If…then…else…endif)	No	No	N/A	No	
TIMEDATE	Allows setting of time & date for analyzer	N/A	N/A	Yes	Yes	Page 352

Legacy Analyzer Command List

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
TIMEDSP	Enables display of time & data on analyzer display	N/A	N/A	No	N/A	
TITLE	Title entry	N/A	N/A	Yes	Yes	Page 353
TM	Trigger Mode	Yes	Yes	Yes	Yes	Page 354
TOI	Third order intermodulation measurement	N/A	N/A	No	N/A	
TOIR	Third order intermodulation response	N/A	N/A	No	N/A	
TRA	Returns trace A amplitude values to controller	Yes	Yes	Yes	Yes	Page 355
TRB	Returns trace B amplitude values to controller	Yes	Yes	Yes	Yes	Page 356
TRC	Returns trace C amplitude values to controller	N/A	N/A	Yes	N/A	Page 357
TRCMEM	Trace C memory	N/A	N/A	No	N/A	
TRDEF	Trace define	No	No	No	No	
TRDSP	Trace display	Yes	Yes	Yes	N/A	Page 358
TRGRPH	Trace graph display	No	No	No	N/A	
TRIGPOL	Trigger polarity	N/A	N/A	N/A	Yes	Page 359
TRMATH	Executes specified trace math at end of sweep	No	No	No	N/A	
TRPRST	Sets trace operations to their preset values	No	No	Yes	N/A	Page 360
TRSTAT	Returns current trace states to controller	Yes	Yes	Yes	N/A	Page 361
TS	Takes a sweep	Yes	Yes	Yes	Yes	Page 362
TVLINE	Selects which horizontal line of video to trigger on	N/A	N/A	No	N/A	
TVLSFRM	Selects the type of video frame to trigger on	N/A	N/A	No	N/A	
TVSTND	TV standard	N/A	N/A	No	N/A	
TVSYNC	Selects polarity of video modulation to trigger on	N/A	N/A	No	N/A	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
TWNDOW	Formats trace information for FFT.	N/A	N/A	No	No	
UNTIL	Conditional Programming (Repeat…Until…)	No	No	N/A	No	
UP	Increases active function value by applicable step	N/A	N/A	No	N/A	
UR	Upper right x-y recorder output voltage at rear	No	No	N/A	N/A	
USTATE	Configures user defined states	No	No	No	N/A	
VARDEF	Variable definition	No	No	No	No	
VARIANCE	Returns the amplitude variance of specified trace	No	No	No	No	
VAVG	Turns video averaging on or off	Yes	Yes	Yes	Yes	Page 363
VB	Video Bandwidth	Yes	Yes	Yes	Yes	Page 365
VBO	Video Bandwidth Coupling Offset	Yes	Yes	N/A	N/A	Page 367
VBR	Video Bandwidth Ratio	N/A	N/A	Yes	Yes	Page 368
VIEW	Stores and views the specified trace	Yes	Yes	Yes	Yes	Page 369
VTL	Video trigger level	N/A	N/A	N/A	Yes	Page 370
WAIT	Suspend program operation for specified time	N/A	N/A	No	N/A	
WINNEXT	Next window	N/A	N/A	No	N/A	
WINOFF	Turns off the window display mode	N/A	N/A	No	N/A	
WINON	Turns on the window display mode	N/A	N/A	No	N/A	
WINZOOM	Window zoom	N/A	N/A	No	N/A	
XCH	Exchanges the two specified traces.	Yes	Yes	Yes	N/A	Page 371
ZMKCNTR	Zone marker at center frequency	N/A	N/A	No	N/A	

Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

Command	Description	8566	8568	8590 Series	8560 Series	Page for Further Details
ZMKPKNL	Zone marker for next peak left	N/A	N/A	No	N/A	
ZMKPKNR	Zone marker for next peak right	N/A	N/A	No	N/A	
ZMKSPAN	Zone marker span	N/A	N/A	No	N/A	

3 Hints and Tips

This chapter includes a list of helpful hints and tips that will help you get the most from Option 266 on your PSA Series analyzer.

A Few Helpful Hints and Tips

These pages lists a few hints and tips that will help you get the most from your analyzer and Option 266.

- **Compatibility - speed and consistency** - for best compatibility with your legacy analyzer, Option 266 should be used on the analyzer whose frequency range most closely matches the frequency range of your legacy analyzer. For example, the best match for the 8565E with its 50 GHz upper frequency limit is the PSA E4448A analyzer which also has an upper frequency limit of 50 GHz.

- **Compatibility and Sweep Times** - for best compatibility between PSA Series analyzers and the legacy analyzers, use the Manual Swept mode for 8566A/B, 8568A/B, or 8590 Series analyzers. Manual Swept mode is the default setting on PSA Series analyzers with Option 266 installed.
  When analyzing stationary signals, you can change to the Best Speed setting, which is accessed from the Auto Couple hardkey and the FFT & Sweep menu. This results in faster sweep times on a PSA analyzer than on the legacy analyzers because of the PSA's better performance. In the majority of applications, this faster speed would be desirable, but that is not always the case.
  When you are using the Best Speed setting, you cannot change the sweep time manually as the sweep time is always coupled to give the fastest sweep times based on the current settings.

- **Time-out (1)** - Agilent suggests that you increase the timeout when performing MA and MF commands to allow previous marker functions to complete correctly.

- **Time-out (2)** - Agilent recommends increasing the timeout on a serial poll (**SPOLL**) due to differences in Sweep Times on some settings. Note, however, that this may not be necessary when using the Best Speed setting on the FFT & Sweep menu (accessed from the Auto Couple hardkey).

- **Synchronization (1)** - to synchronize after an IP command, Agilent recommends that you use the DONE command. We also suggest that the DONE command is used in conjunction with a timeout of about 5 seconds in case the analyzer starts to auto align. Alternatively, you could set auto alignment to Off. To set auto alignment to Off, press **System**, **Alignments**, **Auto Align** on the front panel.

- **Synchronization (2)** - Agilent recommends that synchronization (using the DONE command) is used with marker functions when signal tracking is turned on.

- **AC and DC Coupling** - The 8568A/B has two RF input ports:

  — DC Coupled (with a BNC connector) to handle a frequency range of 100 Hz to 1.5 GHz

  — AC Coupled (with an N Type connector) to handle a frequency range of 100 kHz to 1.5 GHz

  The 8560 Series and the 8590 Series of legacy analyzers only have one RF input port, and support AC and DC coupling through the COUPLE command (page 149).

  The PSA series analyzers only have a single RF input port.

  When using PSA models E4440A, E4443A, and E4445A with the UKB option, you must use DC coupling to see calibrated frequencies of less than 10 MHz. Signals of less than 10 MHz are not calibrated when using AC coupling on these analyzers.

NOTE PSA models E4446A, E4447A, and E4448A do not allow AC coupling.

- **Overloading** - if you are overloading the analyzer, connect a 10 dB attenuator to the RF input and set the **Ext Amp Gain** (external amplifier gain) to -10 dB. This softkey is accessed via the Amplitude hardkey and the **More 1 of 3** softkey.

- **Instrument Presets** - consecutive instrument presets (using the IP command, that is, issuing a command such as IP;IP;IP;) are not required.

- **SCPI Language** - Agilent recommends that you do not repeatedly swap to and from the SCPI language within your programs.

- **GPIB, LAN, and USB Connectivity** - Option 266 only works via the GPIB bus on the PSA. While using Option 266, you can send SCPI commands using the LAN or USB to the instruments. This may be helpful to set certain SCPI parameters on the instrument without the need to turn off the code compatibility application.

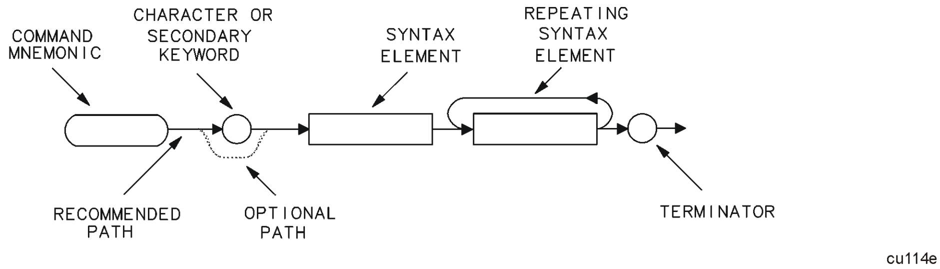
4 Programming Commands

This chapter lists all the supported 8566A/B, 8568A/B, 8560 Series, and 8590 Series compatible commands in alphanumeric order, and gives brief details on their syntax and operation. For more detailed information on these commands, see your 8566A/B, 8568A/B, 8560 Series or 8590 Series Operating and Programming Manual.

Programming Commands

Command Syntax

Command syntax is represented pictorially.



- Ovals enclose command mnemonics. The command mnemonic must be entered exactly as shown.
- Circles and ovals surround secondary keywords or special numbers and characters. The characters in circles and ovals are considered reserved words and must be entered exactly as shown.
- Rectangles contain the description of a syntax element defined in Table 4-1, “Syntax Elements.”
- A loop above a syntax element indicates that the syntax element can be repeated.
- Solid lines represent the recommended path.
- Dotted lines indicate an optional path for bypassing secondary keywords or using alternate units.
- Arrows and curved intersections indicate command path direction.
- Semicolons are the recommended command terminators. Using semicolons makes programs easier to read, prevents command misinterpretation, and is recommended by IEEE Standard 728.

NOTE Uppercase is recommended for entering all commands unless otherwise noted.

Syntax Elements are shown in the syntax diagrams as elements within rectangles. In the syntax diagrams, characters and secondary keywords are shown within circles or ovals. Characters and secondary keywords must be entered exactly as shown.

Table 4-1 Syntax Elements

Syntax Component	Definition/Range
Analyzer command	Any spectrum analyzer command in this chapter, with required parameters and terminators.
Character	S_P a b c d e f g h i j k l m n o p q r s t u v w x y z databyte.
Character & EOI	8-bit byte containing only character data and followed by end-or-identify (EOI) condition, where the EOI control line on GPIB is asserted to indicate the end of the transmission. END signifies the EOI condition.
Character string	A list of characters.
Data byte	8-bit byte containing numeric or character data.
Data byte & EOI	8-bit byte containing numeric or character data followed by end-or-identify (EOI) condition, where the EOI control line on GPIB is asserted to indicate the end of the transmission. END signifies the EOI condition.
Delimiter	| \ @ ^ $ % ; ! Matching characters that mark the beginning and end of a character string, or a list of spectrum analyzer commands. Choose delimiting characters that are not used within the string they delimit.
Digit	0 1 2 3 4 5 6 7 8 9
lsb length	Represents the least significant byte of a two-byte word that describes the number of bytes returned or transmitted. See msb length.
msb length	Represents the most significant byte of a two-byte word that describes the number of bytes returned or transmitted. See lsb length.
Number	Expressed as integer, decimal, or in exponential (E) form. Real Number Range: $\pm 1.797693134862315 \times 10^{308}$, including 0. Up to 15 significant figures allowed. Numbers may be as small as $\pm 2.225073858507202 \times 10^{-308}$ Integer Number Range: –32,768 through +32,767
Output termination	Carriage return (C_R) and line feed (L_F), with end-or-identify (EOI) condition. ASCII codes 13 (carriage return) and 10 (line feed) is sent via GPIB, then the end-or-identify control line on GPIB sets to indicate the end of the transmission.
Units	Represent standard scientific units. Frequency Units: GZ, GHZ, MZ, MHZ, KZ, KHZ, HZ Amplitude Units: DB, DBMV, DM, DBM, DBUV, V, MV, UV Time Units: SC, S, MS, US

Programming Command Descriptions

All supported commands are listed here, along with their descriptions and cross-references to similar commands.

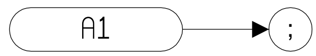
This chapter is not designed to be a comprehensive guide to all 8566A/B, 8568A/B, 8560 Series, or 8590 Series commands. It gives brief descriptions of the supported commands, and highlights important functional or behavioral differences that you should be aware of when transferring existing 8566A/B, 8568A/B, 8560 Series or 8590 Series code to your PSA Series analyzer. For a fuller description of the commands, refer to the 8566A/B, 8568A/B, 8560 Series or 8590 Series Operating and Programming Manual.

In the descriptions of the commands, TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

To avoid confusion between numbers and letters, all commands that incorporate numbers have had the number spelled out and placed in square brackets after the command. For example, the command ‘I1’ is shown as ‘I1 *[one]*’ - that is, the capital letter ‘I’ followed by the number ‘1’, and then the word ‘one’ italicized in square brackets. The italicized word in brackets does not form part of the command.

A1 *[one]* Clear Write for Trace A

Syntax



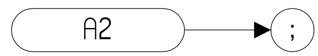
Description

The A1 command sets Trace A to clear write. That is, it continuously displays any signal present at the spectrum analyzer input. The A1 command initially clears Trace A, setting all elements to zero. The sweep trigger then signals the start of the sweep, and Trace A is continually updated as the sweep progresses. Subsequent sweeps send new amplitude information to the display addresses.

NOTE The functions of the command A1 are identical to the CLRW TRA command (page 145).

A2 *[two]*
Maximum Hold for Trace A

Syntax



Description

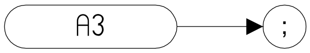
The A2 command updates each trace element with the maximum level detected during the period that the trace has been active.

NOTE The functions of the command A2 are identical to the MXMH TRA command (page 287).

Programming Commands

A3 *[three]*
View Mode for Trace A

Syntax



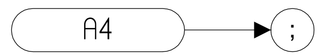
Description

The A3 command displays Trace A and then stops the sweep if no other traces are active. Trace A does not get updated with new data.

NOTE The functions of the command A3 are identical to the VIEW TRA command (page 369).

A4 *[four]*
Blank Trace A

Syntax



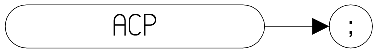
Description

The A4 command blanks Trace A and stops the sweep if no other traces are active. Trace A is not updated.

NOTE The functions of the command A4 are identical to the BLANK TRA command (page 130).

ACP
Adjacent Channel Power

Syntax



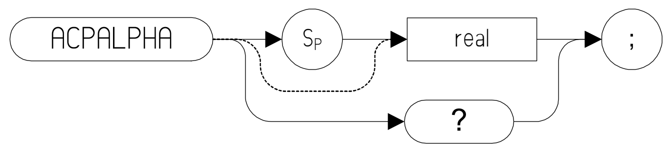
Description

ACP measures the power of the carrier and the power of the channels that are adjacent to the carrier, and then computes a power ratio for each of the adjacent channels, using the carrier power as a reference. ACP performs the adjacent channel power measurement using the values for channel spacing (ACPSP) and channel bandwidth (ACPBW).

NOTE Option 266 supports this measurement using the ANALOG method only.

ACPALPHA
Adjacent Channel Power Alpha Weighting

Syntax



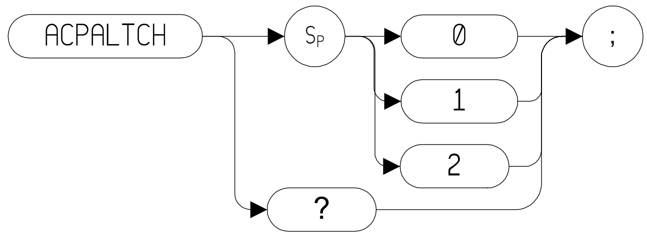
Description

This command sets the alpha weighting for ACP measurements.

Range: Any real number between 0 and 1

ACPALTCH
Adjacent Channel Power Alternate Channels

Syntax



Description

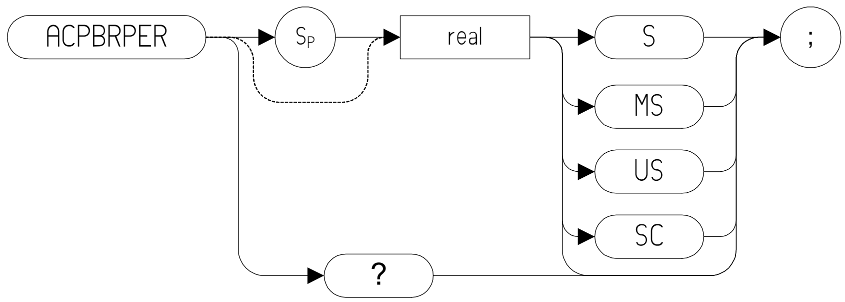
The ACPALTCH command sets the number of alternate channels to be measured by an adjacent channel power measurement to either 0, 1, or 2. The number of alternate channels is used with the ACPRSLTS command (page 107).

Range: 0, 1, or 2.

Default value: 0.

ACPBRPER
Adjacent Channel Power Burst Period

Syntax



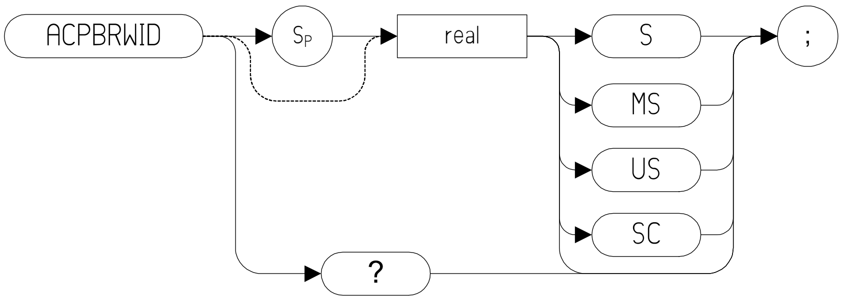
Description

The ACPBRPER command sets the cycle time (period) of the burst RF signal. The cycle time is needed to set the sweep times when using the peak, two bandwidth, burst power, and gated methods for adjacent channel power measurements.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPBRWID
Adjacent Channel Power Burst Width

Syntax



Description

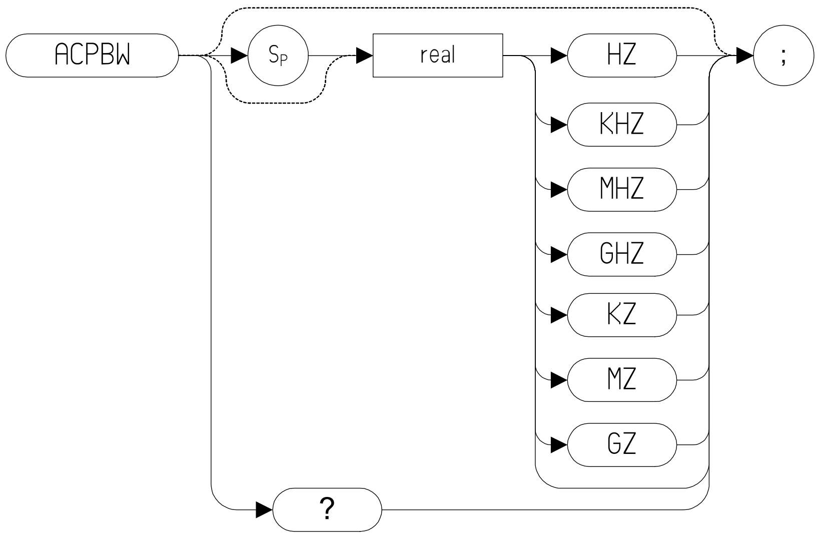
The ACPBRWID command sets the on-time (pulse width) of the burst RF signal. The pulse width is needed to set the gating times when using the gated method for adjacent channel power measurements.

Range 5 µs to 9.5 seconds

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPBW
Adjacent Channel Power Bandwidth

Syntax



Description

The ACPBW command sets the bandwidth of the channels as an active function for the ACPMEAS (page 103) and ACPCOMPUTE (page 99) commands. The channel bandwidth cannot be greater than the channel spacing. If the channel bandwidth is greater than the channel spacing, the measurement is not performed.

ACPCOMPUTE
Adjacent Channel Power Compute

Syntax

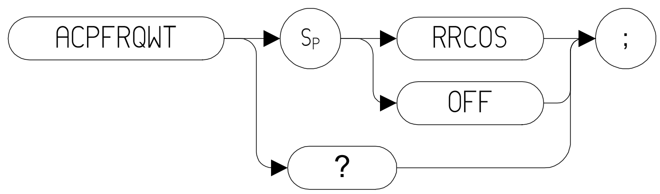
Description

Calculates the ACP of a transmitter based on data on the display. This function does not make a new measurement before computing. The measurement must have been made with ANALOG or PEAK method selected so the appropriate data is available for the calculation.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPFRQWT
Adjacent Channel Power Frequency Weighting

Syntax



Description

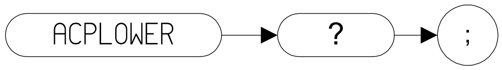
The ACPFRQWT command is used to control the frequency weighting when making an Adjacent Channel Power measurement. Weighting is not used in the measurement if OFF has been selected. Root-raised-cosine weighting is selected with the RRCOS parameter.

Default value: OFF

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPLOWER
Lower Adjacent Channel Power

Syntax



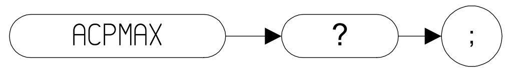
Description

The ACPLOWER query command returns the power ratio result of the Adjacent Channel Power measurement for the lower frequency channel.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPMAX
Maximum Adjacent Channel Power

Syntax



The ACPMAX query command returns the maximum adjacent channel power of the adjacent channel power measurement.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPMEAS
Measure Adjacent Channel Power

Syntax

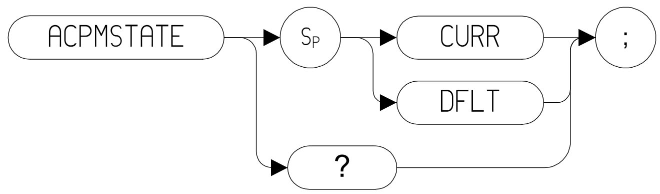
Description

The ACPMEAS command makes a measurement and calculates the adjacent channel power (ACP) of a transmitter. The measurement determines the leakage power that is in the channels adjacent to the carrier. The result is the ratio of the leakage power in the channel adjacent to the total power transmitted by the transmitter.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPMSTATE
Adjacent Channel Power Measurement State

Syntax



Description

Sets the parameters of the measurement state to either the default state (determined by the setup) or the current state. The state parameters that could change between the default state and a current state include:

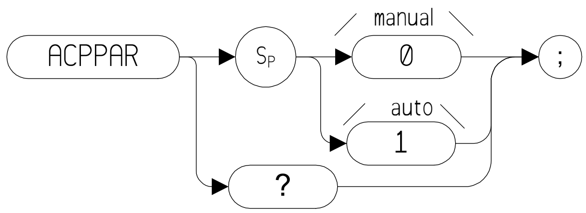
- Resolution bandwidth
- Video bandwidth
- Span
- Sweep time
- Detector mode
- Gating parameters
- Trigger parameters
- Video averaging

Default value: DFLT

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPPAR
Adjacent Channel Power Manual or Auto

Syntax



Description

Determines whether the spectrum analyzer settings for the ACP (page 93), CHP (page 142) or OBW (currently not supported) measurements are set automatically or manually.

If ACPPAR is set to 1 (automatic), the analyzer does the following before making the measurement:

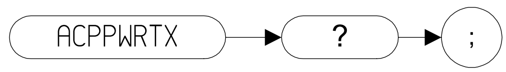
- Performs the Trace Preset (TRPRST (page 360)) command.
- Changes Trigger Mode to Free Run.
- Changes Detector Mode to Sample.
- Changes the amplitude scale to 10 dB per division.
- Sets the frequency span, resolution bandwidth, video bandwidth, center frequency step size and sweep time based on the channel spacing (ACPSP (page 108)) and channel bandwidth (ACPBW (page 98)).
- Takes a sweep

Default value: 1 (auto)

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPPWRTX Adjacent Channel Power Total Power Transmitted

Syntax



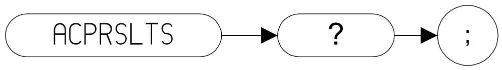
Description

The ACPPWRTX query command returns the result of the total power transmitted calculation of the adjacent channel power measurement. The measurement must be made with the analog or burst power method selected.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPRSLTS Adjacent Channel Power Measurement Results

Syntax



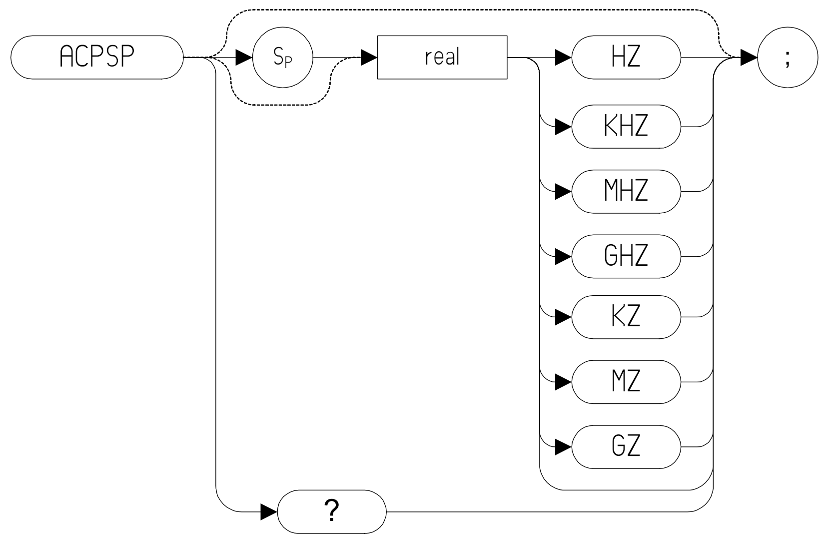
Description

Returns an array of power data resulting from an ACP measurement of an RF signal. The number of alternate channel pairs selected by the ACPALTCH (page 95) command determines the size of the array.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPSP
Adjacent Channel Power Channel Spacing

Syntax



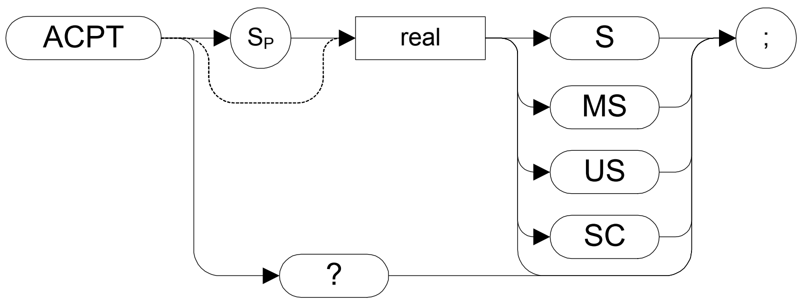
Description

Sets the channel spacing for the ACPMEAS (page 103) and ACPCOMPUTE (page 99) commands.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPT
Adjacent Channel Power T Weighting

Syntax



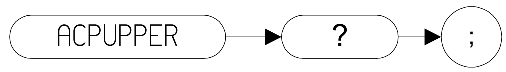
Description

The ACPT command is used to set the T used in weighting for an adjacent channel power measurement.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ACPUPPER
Upper Adjacent Channel Power

Syntax



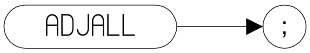
Description

The ACPUPPER query command returns the power ratio result of the adjacent channel power measurement for the upper frequency channel.

NOTE Option 266 supports the ACP measurement using the ANALOG method only.

ADJALL
LO and IF Adjustments

Syntax



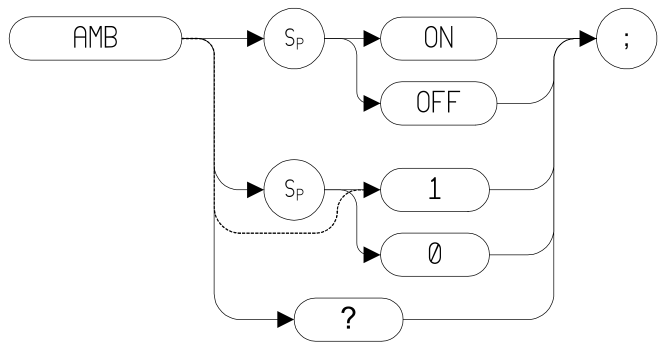
Description

The ADJALL command activates the RF local oscillator (LO) and intermediate frequency (IF) alignment routines. These are the same routines that occur when the spectrum analyzer is switched on. They are also the same routines that are performed when you press **System**, **Alignments**, **Align Now**, **All**.

Commands following ADJALL are not executed until after the analyzer has finished the alignment routines.

AMB
A minus B into A

Syntax



Description

The AMB command subtracts the points in Trace B from the corresponding points in Trace A, and sends the results to Trace A. Thus, AMB can restore the original trace after an APB (page 116) or a KSc (page 193) command has been executed.

The query command AMB? returns different responses depending on the language being used. The 8560 Series languages return either a **1** or a **0** to indicate the On or Off status. The 8566, 8568, and the 8590 Series languages all return either **ON** or **OFF**.

NOTE On the legacy analyzers, the AMB command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until AMB is switched off.

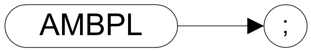
This is not the case with Option 266 - Code Compatibility. The AMB command is performed once only, using the trace data available at the time of execution.

NOTE The functions of the command AMB are identical to the C2 *[two]* command (page 135).

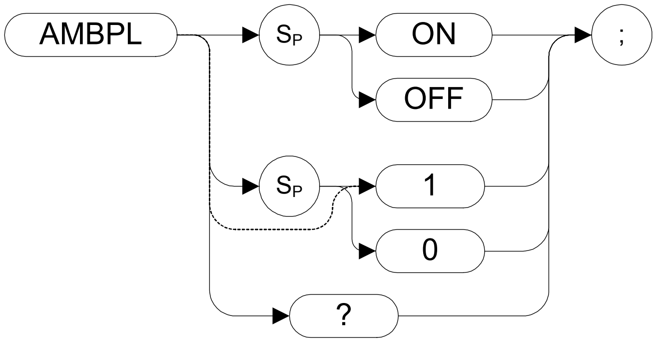
AMBPL
(A minus B) plus Display Line into A

Syntax

8566 and 8568 Remote Language



8560 Series and 8590 Series Remote Language



Description

The AMBPL command does a point-by-point subtraction of Trace B from Trace A, and then adds the display line point values to the difference. The results are sent to Trace A.

NOTE On the legacy analyzers, the AMBPL command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until AMBPL is switched off.

This is not the case with Option 266 - Code Compatibility. The AMBPL command is performed once only, using the trace data available at the time of execution.

NOTE

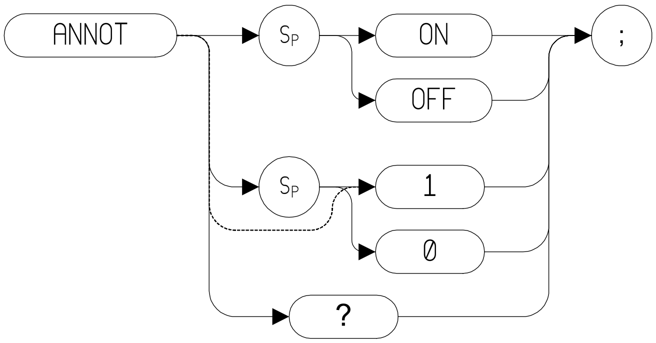
The query command AMBPL? returns different responses depending on the language being used.

8560 Series	Query response is either 1 or 0, indicating ON or OFF state.
8566A	Query response is either ON or OFF.
8566B	Query response is either ON or OFF.
8568A	Query response is either ON or OFF.
8568B	Query response is either ON or OFF.
8590 Series	Query response is either ON or OFF.

Programming Commands

ANNOT
Annotation

Syntax



Preset State: ANNOT ON

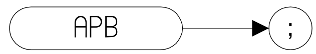
Description

The ANNOT command turns on or off all annotation on the spectrum analyzer display. Softkey labels are not affected by this command and remain displayed.

NOTE The functions of the command ANNOT are identical to the KSo command (page 215) and KSp command (page 216). Note also that these two alternative commands, KSo and KSp, are only valid when the remote language is either HP8566A, HP8566B, HP8568A, or HP8568B.

APB
Trace A Plus Trace B to A

Syntax



Description

The APB command does a point-by-point addition of Trace A and Trace B, and sends the results to Trace A. Thus, APB can restore the original trace after an AMB (page 112) or a C2 (page 135) command has been executed.

NOTE The functions of the command APB are identical to the KSc command (page 193). Note also that the alternative command, KSc, is only valid when the remote language is either HP8566A, HP8566B, HP8568A, or HP8568B.

NOTE On the legacy analyzers, the AMB command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until AMB is switched off.

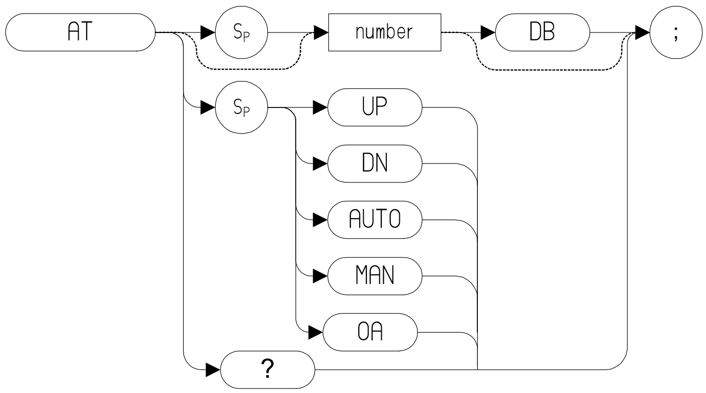
This is not the case with Option 266 - Code Compatibility. The AMB command is performed once only, using the trace data available at the time of execution.

Programming Commands

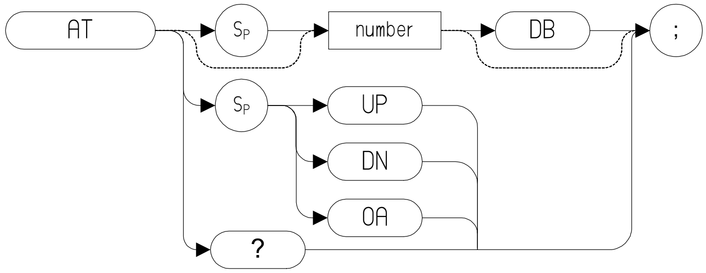
AT
Input Attenuation

Syntax

8560 Series Remote Language



8566 and 8568 Remote Language



8590 Series Remote Language

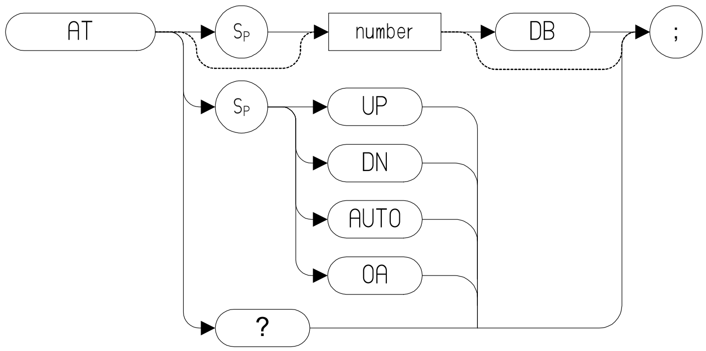


Table 4-2

Item	Description/Default	Range
Number	Any real number or integer. If the value you enter is not a valid value for the analyzer you are using, it will switch automatically to the closest valid setting. Default units are dB.	0 to 70 dB specified absolutely and 10 to 70 dB in 10 dB steps

Preset State: 10 dB

Step Increment: 10 dB

Description

Specifies the RF input attenuation.

Although any attenuation level from 0 dB to 70 dB in PSA series analyzers can be specified using absolute values, you can never set attenuation below 10 dB using the DOWN steps. This is a safety feature to prevent inadvertent setting of attenuation to a level that could damage the analyzer.

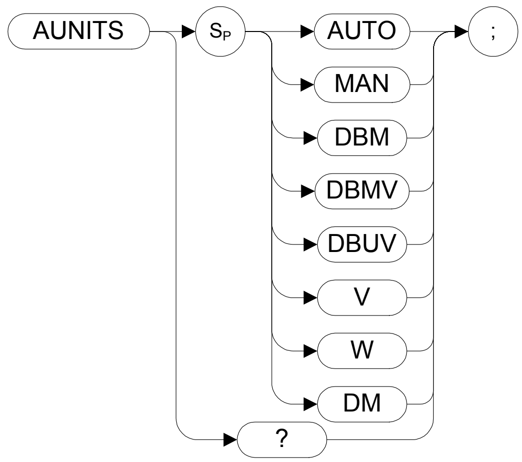
CAUTION Signal levels above +30 dBm will damage the spectrum analyzer.

NOTE You cannot step down below 10 dB. To set levels below 10 dB, you must specify the attenuation absolutely. For example, to set attenuation to 0 dB, you must use the command **AT 0DB**.

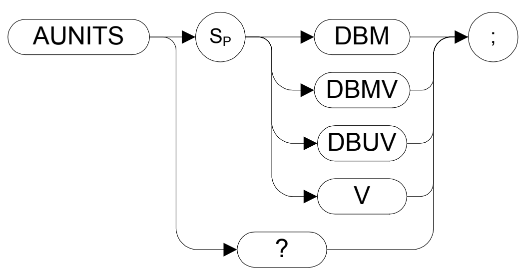
AUNITS
Absolute Amplitude Units

Syntax

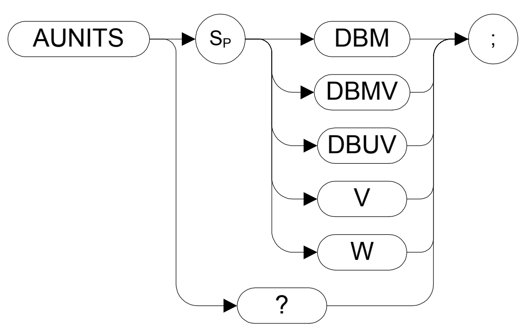
8560 Series Remote Language



8566 and 8568 Remote Language



8590 Series Remote Language



Description

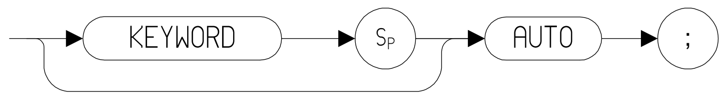
Specifies the amplitude readout units for the reference level, the marker, and the display line.

NOTE If your selected remote language is any of the 8560 Series and you use either the AUTO or the MAN parameter, a warning will be displayed informing you that the command is not supported with either of these parameters.

NOTE The functions of the command AUNITS are identical to the commands KSA (page 188), KSB (page 190), KSC (page 192), and KSD (page 194). Note also that these four alternative commands, KSA, KSB, KSC, and KSD are only valid when the remote language is either HP8566A, HP8566B, HP8568A, or HP8568B.

AUTO
Auto Couple

Syntax



Description

The AUTO command couples the active functions automatically. Sending the command HD; AUTO will cause all functions to be auto coupled.

NOTE On the legacy analyzers, if the currently active function *is not* represented by one of the keywords listed below when the command AUTO is executed, all functions are auto coupled. If the active function *is* represented by one of the keywords below, only that function is auto coupled.

This does not happen with Option 266 Programming Code Compatibility Suite on the PSA Series analyzers because they do not recognize active functions.

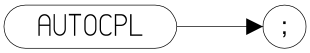
Keywords Used in the Command

AT	Couples attenuation to the reference level.
DL	Turns the display line off but does not change the value of the line.
MKA	Turns the marker off.
MKD	Turns the delta marker off. It does not turn the current marker off.
MKFCR	Deactivates the use of user-supplied counter resolution value, but the value remains unchanged.
MKN	Turns the marker off.
RB	Couples the resolution bandwidth to the frequency span.
SRCPSTP	Sets the source power step to 0 (zero).
SRCPSWP	Turns power sweep off.
SCRPWR	Turns source power off.
SS	Couples the step size to the frequency span.

ST	Couples the sweep time to the frequency span.
TH	Turns the display of the threshold off, but does not change its value or prevent its usage in peak searching.
VAVG	Stops averaging.
VB	Couples the video bandwidth to the resolution bandwidth.
VBR	Sets the video to bandwidth ratio to 0.3.

AUTOCPL
Auto Coupled

Syntax

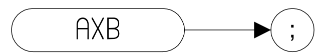


Description

Sets video bandwidth, resolution bandwidth, input attenuation, sweep time and center frequency step-size to coupled mode.

AXB
Exchange Trace A and Trace B

Syntax



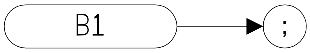
Description

This command exchanges Trace A and Trace B, point by point.

NOTE The functions of the command AXB are identical to the EX command (page 171) and to the XCH TRA,TRB command (page 371).

B1 *[one]*
Clear Write for Trace B

Syntax



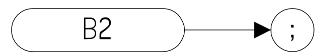
Description

The B1 command sets Trace B to clear write. That is, it continuously displays any signal present at the spectrum analyzer input. The B1 command initially clears Trace B, setting all elements to zero. The sweep trigger then signals the start of the sweep, and Trace B is continually updated as the sweep progresses. Subsequent sweeps send new amplitude information to the display addresses.

NOTE The functions of the command B1 are identical to the CLRW TRB command (page 145).

B2 *[two]*
Maximum Hold for Trace B

Syntax



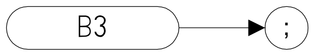
Description

The B2 command updates each trace element with the maximum level detected while the trace is active.

NOTE The functions of the command B2 are identical to the MXMH TRB command (page 287).

B3 *[three]* View Mode for Trace B

Syntax



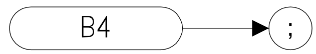
Description

The B3 command displays Trace B and then stops the sweep if no other traces are active. Trace B does not get updated.

NOTE The functions of the command B3 are identical to the VIEW TRB command (page 369).

B4 *[four]*
Blank Trace B

Syntax



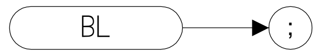
Description

The B4 command blanks Trace B and stops the sweep if no other traces are active. Trace B is not updated.

NOTE The functions of the command B4 are identical to the BLANK TRB command (page 130).

BL
Trace B minus Display Line to Trace B

Syntax



Description

The BL command subtracts the display line from Trace B and sends the results to Trace B.

NOTE The command BL is calculated differently depending on the language being used.

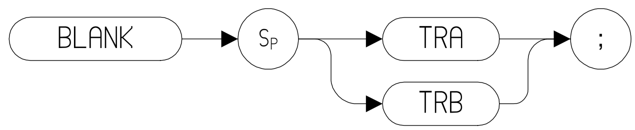
8560 Series	The calculation is performed in units of dBm.
8566A	The calculation is performed in display units.
8566B	The calculation is performed in display units.
8568A	The calculation is performed in display units.
8568B	The calculation is performed in display units.
8590 Series	The calculation is performed in display units.

NOTE The functions of the command BL are identical to the BML command (page 131).

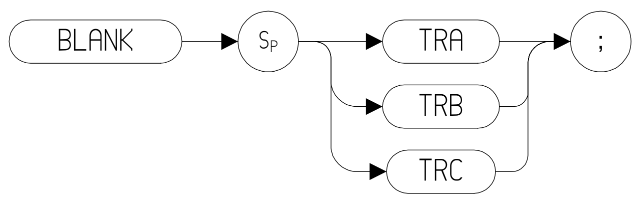
BLANK
Blank Trace

Syntax

8560 Series Remote Language



8566, 8568, and 8590 Series Remote Language



Preset State: BLANK TRB, BLANK TRC

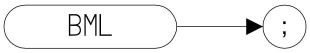
Description

Blanks Trace 1, trace 2, or trace 3, and stops taking new data into the specified trace. TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

NOTE The functions of the command BLANK are identical to the A4 command (page 92), the B4 command (page 128), and KSk command (page 206).

BML
Trace B Minus Display Line

Syntax



Description

The BML command subtracts the display line from trace B (point by point), and sends the difference to trace B. Trace B corresponds to Trace 2.

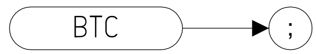
NOTE Remote language 8560 - the BML command is performed in dBm units.

Remote languages 8566A, HP8566B, HP8568A, 8568B, and the 8590 Series - the BML command is performed in display units.

NOTE The functions of the command BML are identical to the BL command (page 129).

BTC
Transfer Trace B to Trace C

Syntax



Description

The BTC command transfers Trace B data to Trace C

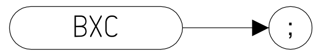
NOTE Trace C cannot be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data transferred from Trace B to Trace C, you must follow the four step process below.

- Select single sweep mode (S2 or SNGLS command)
- Select the desired analyzer settings
- Take one complete sweep
- Transfer the data

NOTE The functions of the command BTC are identical to the KSl command (page 208).

BXC
Exchange Trace B and Trace C

Syntax



Description

The BXC command exchanges Trace B data with Trace C data.

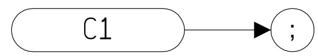
NOTE Trace C must not be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data exchanged between Trace B and Trace C, you must follow the four step process below.

- Select single sweep mode (S2 or SNGLS command)
- Select the desired analyzer settings
- Take one complete sweep
- Exchange the data

NOTE The functions of the command BXC are identical to the KSi command (page 203) and to the XCH TRB,TRC command (page 371).

C1 *[one]*
Set A Minus B Mode Off

Syntax



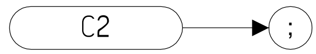
Description

The C1 command turns the A Minus B mode off. That is, it switches off the functionality that was switched on by the C2 command (page 135) or by the AMB ON command (page 112).

NOTE The functions of the command C1 are identical to the AMB OFF command (page 112).

C2 *[two]*
A Minus B Into A

Syntax



Description

The C2 command subtracts the points in Trace B from the corresponding points in Trace A, and sends the results to Trace A. Thus, if your input signal remains unchanged, C2 can restore the original trace after an APB command (page 116) or a KSc (page 193) command has been executed.

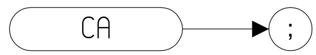
NOTE The functions of the command C2 are identical to the AMB ON command (page 112).

NOTE On the legacy analyzers, the C2 command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until C2 is switched off by issuing the C1 command.

This is not the case with Option 266 - Programming Code Compatibility. The C2 command is performed once only, using the trace data available at the time of execution.

CA
Couple Attenuation

Syntax



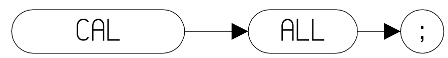
Description

During normal operation, the spectrum analyzer’s input attenuation is coupled to the reference level. This coupling keeps the mixer input at a level such that a continuous wave signal displayed at the reference level is at or below -10 dBm (or the value specified in the ML command.)

The CA command sets the threshold to -10 dBm (or to the value specified by the ML command (page 283) or the KS, command (page 186)). The counterpart to the CA command is the AT command (page 117), which allows levels less than the threshold value at the mixer input.

CAL
Calibration

Syntax

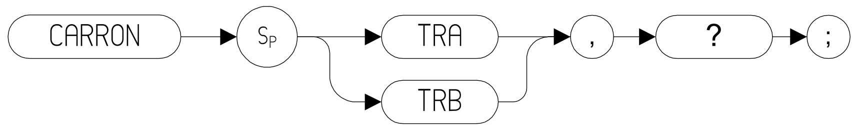


Description

Calibrates the logarithmic and step gain amplifiers, the attenuator and the amplitude and frequency of the resolution bandwidth filters.

CARRON
Carrier On Power

Syntax



Description

Measures the average power of the carrier during the portion of time when it is on and within 20dB of its peak level.

CF
Center Frequency

Syntax

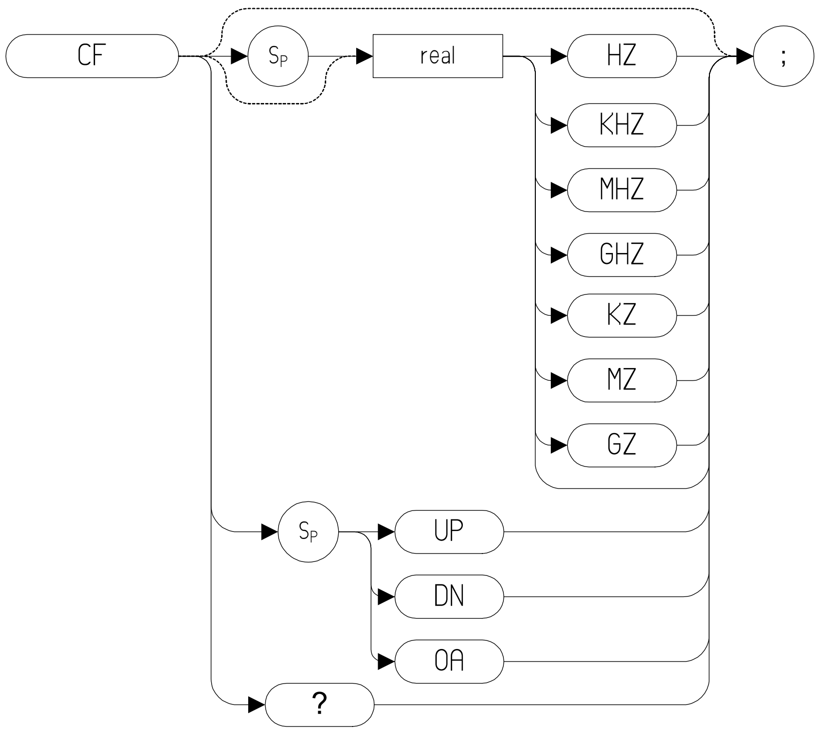


Table 4-3

Item	Description/Default	Range
REAL	Any real or integer number. Default unit is HZ.	Frequency range of the spectrum analyzer

Description

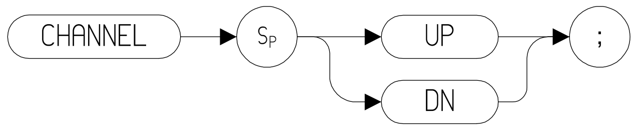
The CF command specifies the value of the center frequency.

The step size depends on whether the frequency has been coupled to the span width using the CS command (page 151). When coupled, the step size is 10% of the span, or one major graticule division; when uncoupled, the step size is determined by the SS command (page 336).

NOTE Although the spectrum analyzer allows entry of frequencies not in the specified frequency range, using frequencies outside the frequency span of the spectrum analyzer is not recommended and is not warranted to meet specifications.

CHANNEL
Channel Selection

Syntax



Description

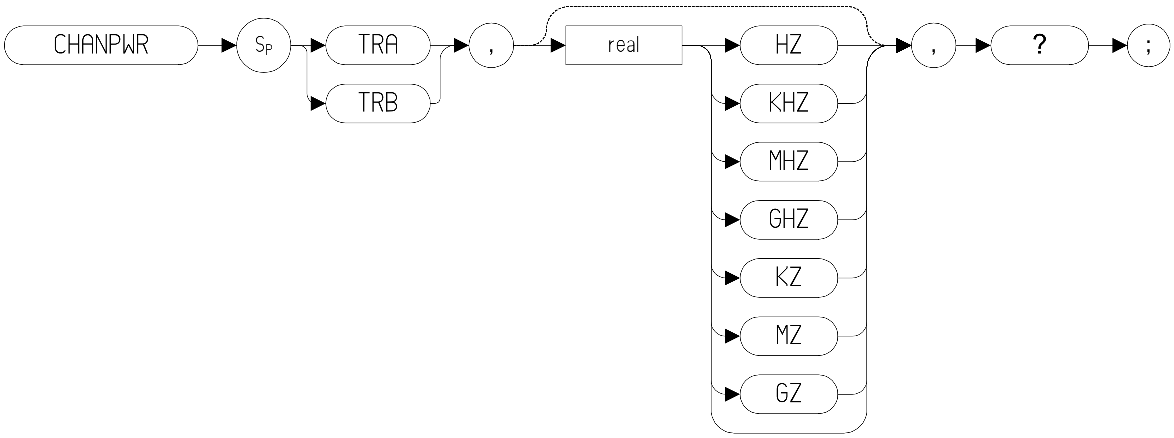
Increments or decrements the spectrum analyzer center frequency by one channel spacing.

NOTE The channel spacing value is set using the ACPSP command (page 108).

Programming Commands

CHANPWR
Channel Power

Syntax



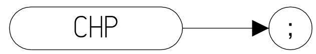
Description

Measures the power within the specified channel bandwidth.

NOTE If no channel bandwidth is specified in the command, the channel bandwidth is set using the CHPWRBR command (page 143).

CHP
Channel Power

Syntax



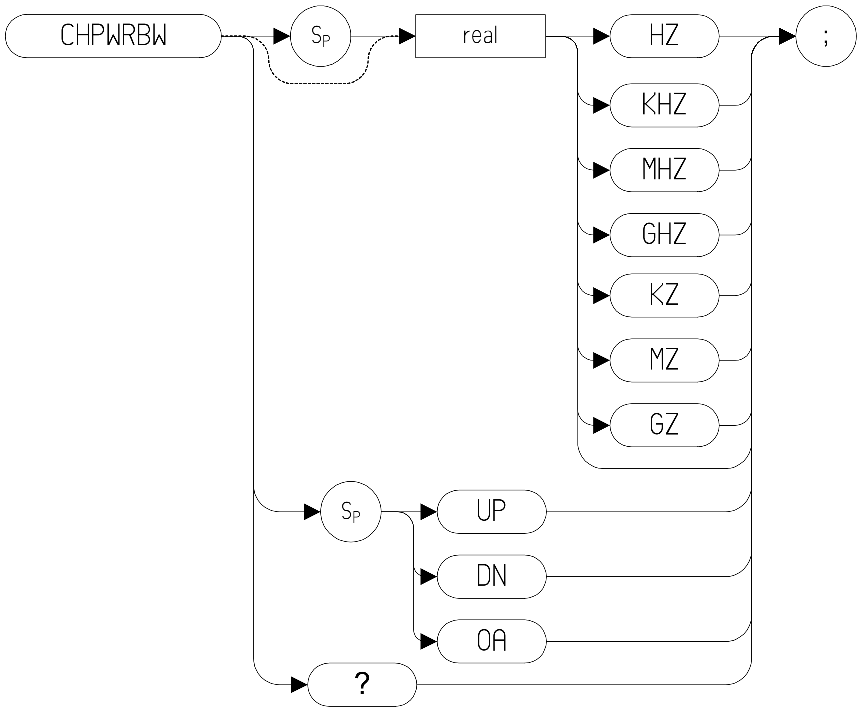
Description

The CHP command performs the channel power measurement.

NOTE The channel bandwidth is set with the ACPBW command (page 98). Channel spacing is set with the ACPSP command (page 108).

CHPWRBW
Channel Power Bandwidth

Syntax



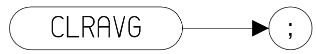
Description

Queries or sets the current value of the channel power bandwidth. Channel power can be measured with the CHANPWR command (page 141).

Programming Commands

CLRAVG
Clear Average

Syntax



Description

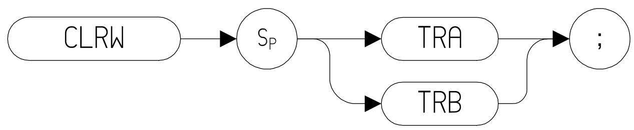
The command restarts the VAVG command by resetting the number of averaged sweeps to one. The video averaging routine resets the number of sweeps, but does not stop video averaging. Use “VAVG OFF;” to stop video averaging.

CLRW
Clear Write

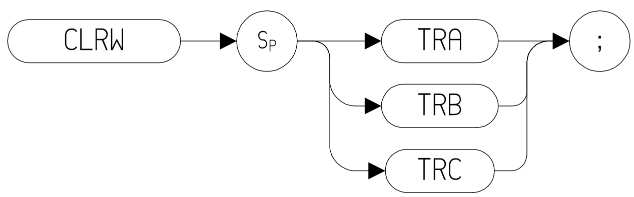
Clears the specified trace and enables trace data acquisition.

Syntax

8560 Series Remote Language



8566, 8568, and 8590 Series Remote Language



Preset State: CLRW TRA

Description

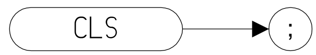
The CLRW command places the indicated trace in clear-write mode. Data acquisition begins at the next sweep. (See the TS command (page 362) for more information about data acquisition.)

TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

NOTE The functions of the command CLRW are identical to the A1 command (page 89) and B1 command (page 125).

CLS
Clear Status Byte

Syntax

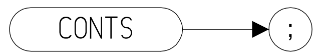


Description

Clears all the status bits from the status byte.

CONTS
Continuous Sweep

Syntax



Preset State: CONTS

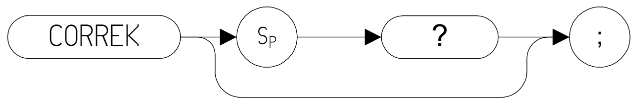
Description

The CONTS command sets the spectrum analyzer to continuous sweep mode. In the continuous sweep mode, the spectrum analyzer takes its next sweep as soon as possible after the current sweep (as long as the trigger conditions are met). A sweep may temporarily be interrupted by data entries made over the remote interface or from the front panel.

NOTE The functions of the command CONTS are identical to the S1 command (page 320).

CORREK
Correction Factors On

Syntax

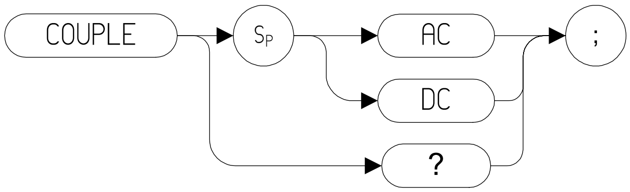


Description

The CORREK command queries the state of the analyzer frequency corrections. It returns a “1” if the correction factors are on, a “0” if they are off.

COUPLE
Input Coupling

Syntax



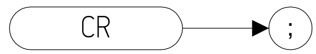
Description

The COUPLE command selects AC or DC coupling.

NOTE PSA models E4446A, E4447A, and E4448A do not allow AC coupling.

CR
Couple Resolution Bandwidth

Syntax



Description

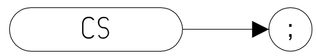
The CR command couples the resolution bandwidth to the video bandwidth and to the sweep time.

The counterpart to the CR command is the RB command (page 309) which breaks the coupling. Use the CR command to re-establish coupling after executing an RB command.

NOTE CR uses the coupling settings from the PSA analyzer. These may differ from the settings that you would have seen on the legacy analyzer being emulated here.

CS
Couple Frequency Step Size

Syntax



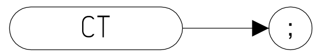
Description

The CS command couples the center frequency step size to the span width so that the step size equals 10% of the span width, or one major graticule division.

The counterpart to the CS command is the SS command (page 336) which breaks the coupling. Use the CS command to re-establish coupling after an SS command has been executed.

CT
Couple Sweep Time

Syntax



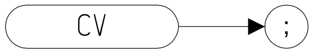
Description

The CT command couples the sweep time to the span, resolution bandwidth and video bandwidth.

The counterpart to the CT command is the ST command (page 338) which breaks the coupling. Use the CT command to re-establish coupling after an ST command has been executed.

CV
Couple Video Bandwidth

Syntax



Description

The CV command couples the video bandwidth to the resolution bandwidth.

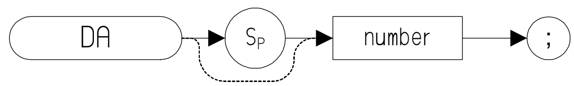
The counterpart to the CV command is the VB command (page 365) which breaks the coupling. Use the CV command to re-establish coupling after executing a VB command.

NOTE CV uses the coupling settings from the PSA analyzer. These may differ from the settings that you would have seen on the legacy analyzer being emulated here.

Programming Commands

DA
Display Address

Syntax



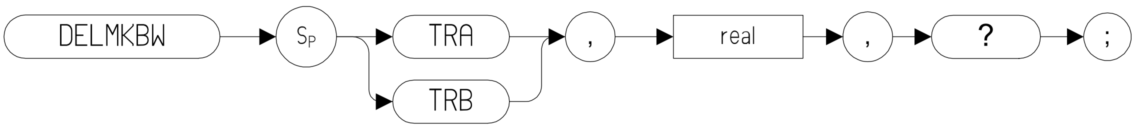
Description

The DA command returns the contents of the given display address to the controller

NOTE This command only supports the use of the DA 1, DA 1025, and DA 3073; these display addresses contain the trace data and are equivalent to using the commands TRA? (page 355), TRB? (page 356), TRC? (page 357), TA (page 348) and TB (page 349).

DELMKBW
Occupied Power Bandwidth Within Delta Marker

Syntax



Description

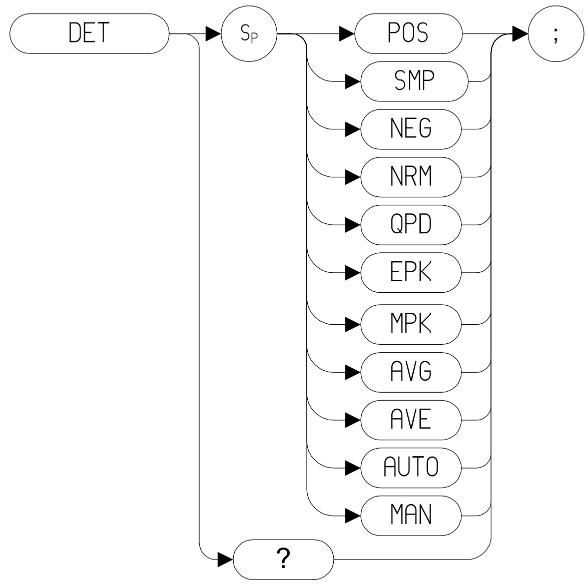
Calculates the OBW with respect to the power between the displayed delta markers. The power between the displayed markers is then used as the reference, rather than using the total power in the frequency span as is done in the PWRBW (page 301) command.

NOTE If the DELMKBW command is used when no marker is active, a delta marker is activated at the center frequency, and the returned bandwidth is 0. If the active marker is a normal marker when the DELMKBW command is used, the marker type is changed to delta, and the returned bandwidth is 0.

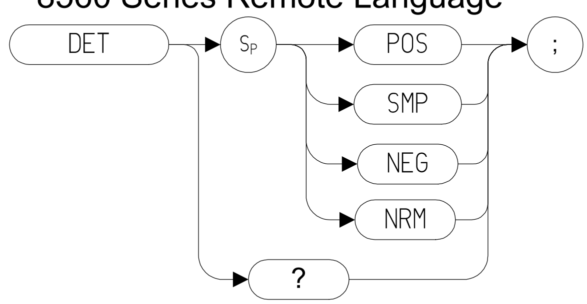
DET
Detection Mode

Syntax

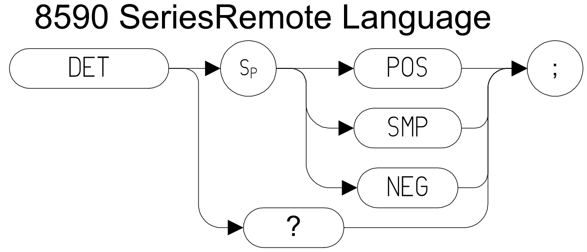
8566 and 8568 Remote Language



8560 Series Remote Language



8590 SeriesRemote Language



Preset State: DET NRM

Description

The DET command selects the type of spectrum analyzer detection (positive-peak, negative peak, sample, normal, and so on).

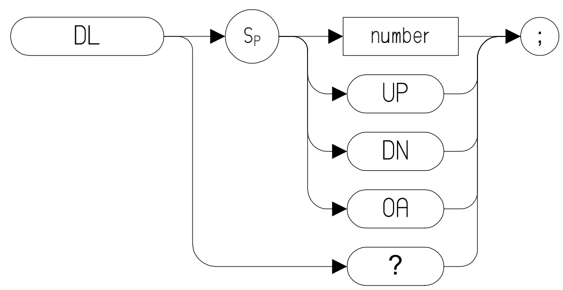
POS	enables positive-peak detection, which displays the maximum video signal detected over a number of instantaneous samples for a particular frequency.
SMP	enables sample detection, which uses the instantaneous video signal value. Video averaging and noise-level markers, when activated, activate sample detection automatically.
NEG	enables negative peak detection in sweep times of less than or equal to 200 ms.
NRM	enables the *'rosenfell'* detection algorithm that selectively chooses between positive and negative values.
QPD	enables quasi-peak detection for EMC measurements.
EPK	enables EMI peak detection for EMC measurements.
MPK	enables MIL peak detection to meet military specifications when making EMC measurements.
AVG	enables EMI average detection for EMC measurements.
AVE	enables average peak detection (non-EMC measurements).
AUTO	sets the detector function selection to auto.
MAN	sets the detector function selection to manual.

NOTE The functions of the DET command are identical to the KSa command (page 189), the KSb command (page 191), the KSd command (page 195), the KSe command (page 197), the Q0 command (page 303), and the Q1 command (page 304).

DL
Display Line

Syntax

8566 and 8568 Remote Language



8590 Series and 8590 Series Remote Language

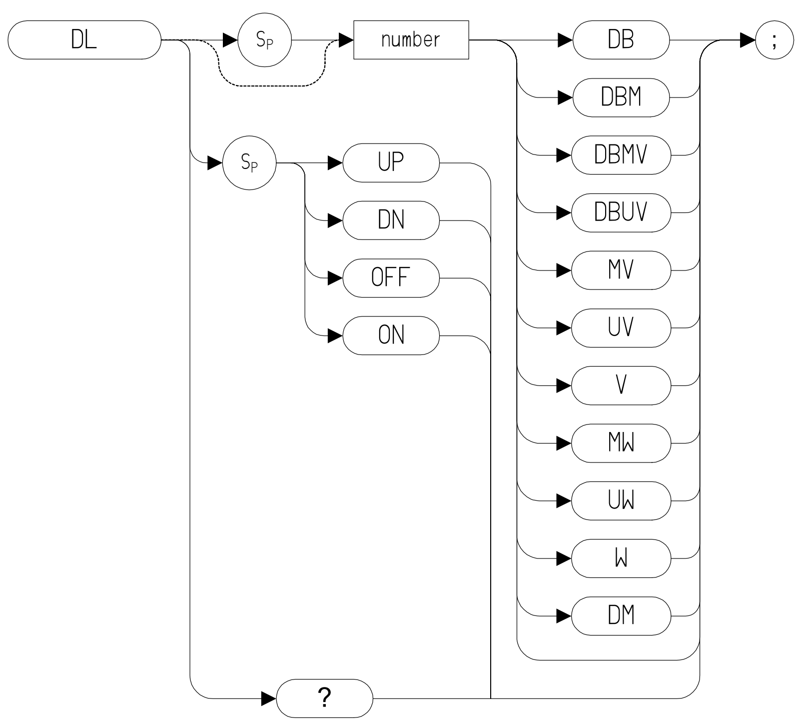


Table 4-4

Item	Description/Default	Range
NUMBER	Any real or integer number. Default units are dBm.	Dependent on the reference level

Preset State: DL OFF

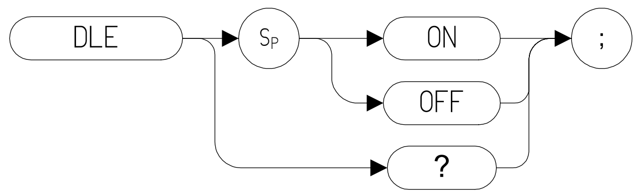
Step Increment: 1 major graticule division

Description

Defines the level of the display line and displays it on the spectrum analyzer screen.

DLE
Display Line Enable

Syntax



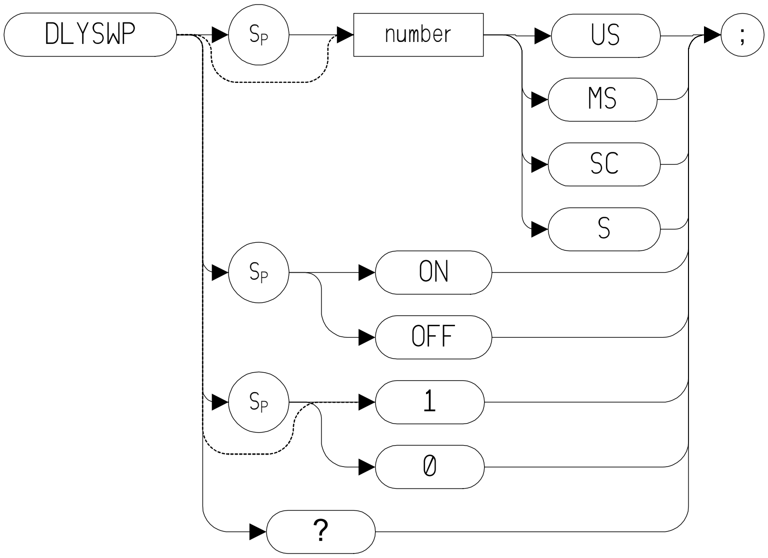
Description

The DLE command enables or disables the display line.

Programming Commands

DLYSWP
Delay Sweep

Syntax



Description

Delays the start of the sweep until the specified time after the trigger event has elapsed.

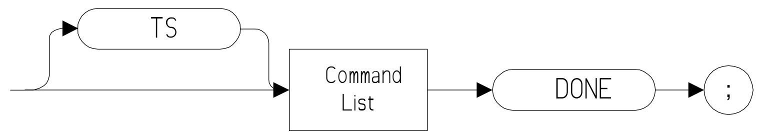
NOTE A query response of 0 indicates that DLYSWP is switched off.

Programming Commands

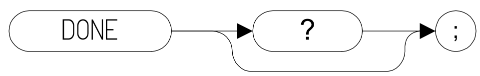
DONE
Done

Syntax

8566 and 8568 Remote Language



8590 Series and 8590 Series



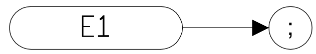
Description

Allows you to determine when the spectrum analyzer has parsed a list of spectrum analyzer commands and has executed all commands prior to and including DONE. The DONE command returns a value of “1” when all commands in a command string or command list have been completed.

If a take sweep (TS command (page 362)) precedes the command list, the TS command acts as a synchronizing function since the command list execution begins after the sweep has been completed.

E1*[one]*
Peak Marker

Syntax



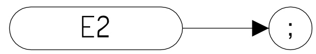
Description

The E1 command positions the marker at the signal peak.

NOTE The functions of the E1 command are identical to MKPK (no secondary keyword) and MKPK HI (page 270).

E2 *[two]*
Marker to Center Frequency

Syntax



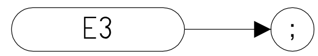
Description

The E2 command positions the marker on the screen at the center frequency position.

NOTE The functions of the E2 command are identical to the MKCF command (page 258).

E3 *[three]*
Delta Marker Step Size

Syntax



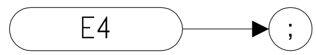
Description

The E3 command establishes the center frequency step size as being the frequency difference between the delta marker and the active marker.

NOTE The functions of the E3 command are identical to the MKSS command (page 277).

E4 *[four]*
Marker to Reference Level

Syntax



Description

The E4 command moves the active marker to the reference level.

NOTE The functions of the E4 command are identical to the MKRL command (page 275).

EDITDONE
End of Limit Line Edits

Syntax

Description

The EDITDONE command is used at the completion of limit-line editing within the EDITLIML command (page 168).

EDITLIML
Edit Limit Line

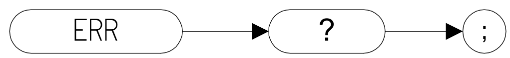
Syntax

Description

The EDITLIML command turns the currently active limit line off, and puts the analyzer into limit-line edit mode.

ERR
Error

Syntax

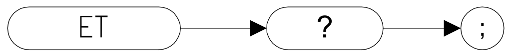


Description

The ERR command returns an integer list of error codes to the controller.

ET
Elapsed Time

Syntax

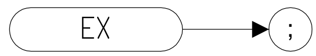


Description

The ET command returns to the controller the elapsed time (in hours) of analyzer operation.

EX
Exchange Trace A and Trace B

Syntax



Description

This command exchanges Trace A and Trace B, point by point.

NOTE The functions of the EX command are identical to the AXB command (page 124) and to the XCH TRA,TRB command (page 371).

FA
Start Frequency

Syntax

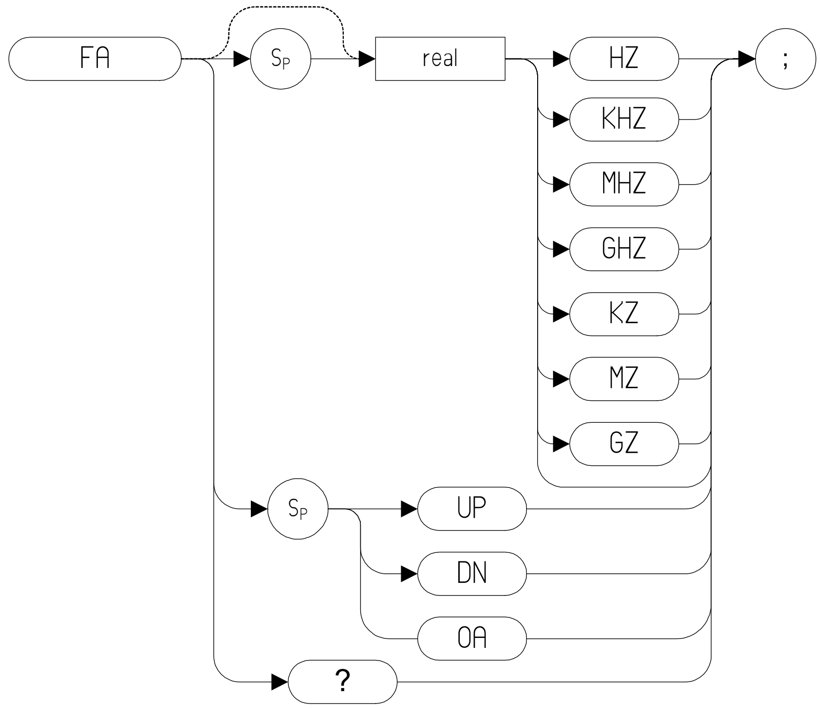


Table 4-5

Item	Description/Default	Range
REAL	Any real or integer number. Default unit is Hz.	Frequency range of the spectrum analyzer

Step Increment: Frequency span divided by 10

Description

The FA command specifies the start frequency value. The start frequency is equal to the center frequency minus (the span divided by two) (FA = CF – SP/2). Changing the start frequency changes the center frequency and span.

NOTE The OA parameter only returns the current value to the controller. It does not set the active function to the start frequency.

FB
Stop Frequency

Syntax

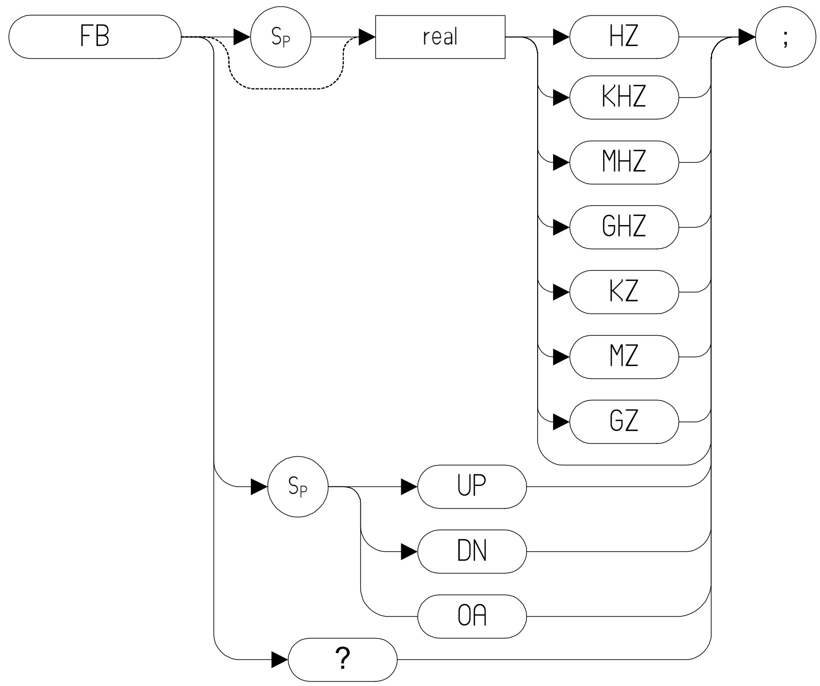


Table 4-6

Item	Description/Default	Range
REAL	Any real or integer number. Default unit is Hz.	Frequency range of the spectrum analyzer

Step Increment: Frequency span divided by 10

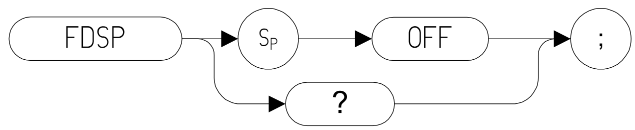
Description

The FB command specifies the stop frequency value. The stop frequency is equal to the center frequency plus the span divided by two (FB = CF + SP/2). Changing the stop frequency changes the center frequency and span.

NOTE The OA parameter only returns the current value to the controller. It does not set the active function to the stop frequency.

FDSP
Frequency Display Off

Syntax



Description

The FDSP command turns the frequency annotation OFF.

NOTE It is not possible enable or disable the frequency annotation alone, leaving other annotation unaffected. Thus, the FDSP command behaves in the same way as ANNOT (page 115) If the FDSP command has been used to disable the frequency annotation, sending the ANNOT ON command will not re-enable the display annotation. The display annotation will only be displayed by sending the IP (page 185) command.

FOFFSET
Frequency Offset

Syntax

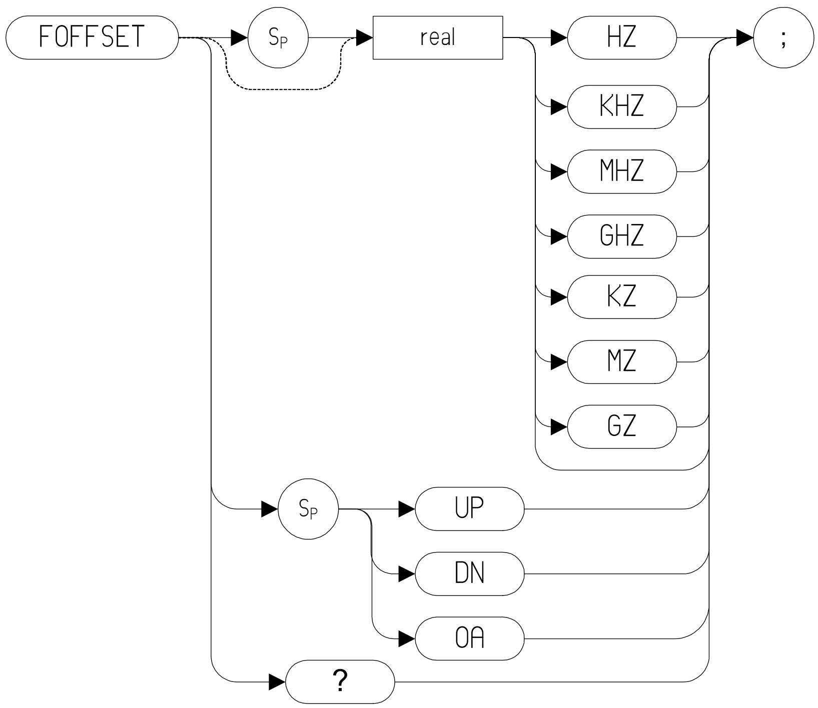


Table 4-7

Item	Description/Default	Range
REAL	Any real or integer number. Default unit is Hz.	

Preset State: 0 Hz

Description

The FOFFSET command selects a value that offsets the frequency scale for all absolute frequency readouts (for example, center frequency). Relative values such as span and marker delta are not offset.

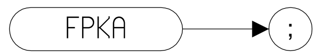
When an offset is in effect, it is displayed beneath the bottom graticule line on the spectrum analyzer screen.

Execute “FOFFSET 0;” or “IP;” to turn off the offset.

NOTE The functions of the FOFFSET command are identical to the KSV command (page 218).

FPKA
Fast Preselector Peak

Syntax



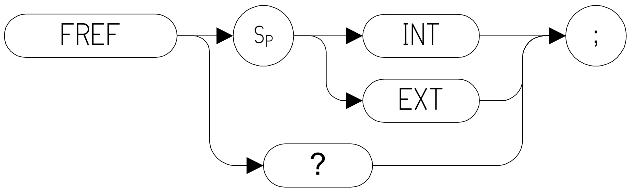
Description

The FPKA command automatically adjusts the preselector frequency to yield the greatest signal level at the active marker. It returns the amplitude of the active marker.

NOTE The FPKA command is only available when the analyzer’s upper frequency limit is greater than 3 GHz. The command is not supported in analyzers with an upper frequency limit of 3 GHz or less, and will return an error message when used.

FREF
Frequency Reference

Syntax

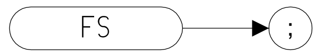


Description

The FREF command specifies whether an external source or an internal source is being used.

FS
Full Span

Syntax



Description

The FS command sets the frequency span of the spectrum analyzer to full span. Resolution bandwidth, video bandwidth, and sweep time are all set to auto-coupled.

NOTE The functions of the FS command are identical to the LF command (page 223).

NOTE Whenever the frequency range of the analyzer you are using does not match the remote language's own range, the span will be limited by the capabilities of the analyzer. The tables on the following pages list the frequency ranges for all the supported remote languages when running on any of Agilent's PSA Series of analyzers.

Table 4-8 PSA Series - Frequency Ranges Set by the FS Command

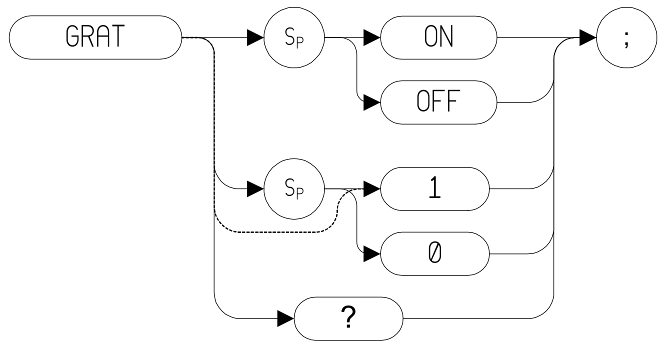
	E4440A	E4443A	E4445A	E4446A	E4447A	E4448A
Remote Language	**Frequency Range**	**Frequency Range**	**Frequency Range**	**Frequency Range**	**Frequency Range**	**Frequency Range**
8560E	0 Hz - 2.9 GHz	0 Hz- 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz
8561E	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz
8562E	0 Hz - 13.2 GHz	0 Hz - 6.7 GHz	0 Hz - 13.2 GHz	0 Hz - 13.2 GHz	0 Hz - 13.2 GHz	0 Hz - 13.2 GHz
8563E	0 Hz - 26.5 GHz	0 Hz - 6.7 GHz	0 Hz - 13.2 GHz	0 Hz -26.5 GHz	0 Hz -26.5 GHz	0 Hz - 26.5 GHz
8564E	0 Hz - 26.5 GHz	0 Hz - 6.7 GHz	0 Hz - 13.2 GHz	0 Hz - 40.0 GHz	0 Hz - 40.0 GHz	0 Hz - 40.0 GHz
8565E	0 Hz - 26.5 GHz	0 Hz - 6.7 GHz	0 Hz - 13.2 GHz	0 Hz - 44.0 GHz	0 Hz - 42.98 GHz	0 Hz - 50.0 GHz
8566A	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz
8566B	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz
8568A	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz
8568B	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz
8590L	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz
8591E	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz	0 Hz - 1.8 GHz
8592L[a]	2.75 GHz - 22.0 GHz	2.75 GHz - 6.7 GHz	2.75 GHz - 13.2 GHz	2.75 GHz - 22.0 GHz	2.75 GHz - 22.0 GHz	2.75 GHz - 22.0 GHz
8593E[a]	2.75 GHz - 22.0 GHz	2.75 GHz - 6.7 GHz	2.75 GHz - 13.2 GHz	2.75 GHz - 22.0 GHz	2.75 GHz - 22.0 GHz	2.75 GHz - 22.0 GHz
8594E	0 Hz - 1.5 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz
8595E	0 Hz - 1.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz
8596E[a]	0 Hz - 1.5 GHz	0 Hz - 6.7 GHz	0 Hz - 12.8 GHz	0 Hz - 12.8 GHz	0 Hz - 12.8 GHz	0 Hz - 12.8 GHz

a. The command HNLOCK (Harmonic Lock) is not supported in Option 266. Thus, the different frequency spans associated with the various harmonic bands are also not supported.

Programming Commands

GRAT
Graticule

Syntax



Preset State: GRAT ON

Description

Turns the graticule on or off.

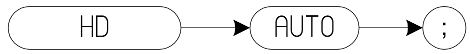
NOTE The functions of the GRAT command are identical to the KSm command (page 211) and the KSn command (page 213).

NOTE The query command GRAT? returns different responses depending on the language being used.

8560 Series	Query response is either 1 or 0, indicating ON or OFF state.
8566A	Query response is either ON or OFF.
8566B	Query response is either ON or OFF.
8568A	Query response is either ON or OFF.
8568B	Query response is either ON or OFF.
8590 Series	Query response is either ON or OFF.

HD
Hold Data Entry

Syntax



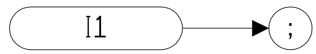
Description

Disables data entry via the spectrum analyzer numeric keypad, knob, or step keys. The active function readout is blanked, and any active function is deactivated.

NOTE This command will only be supported when followed by the parameter AUTO (page 121). All functions will then be auto-coupled.

I1 *[one]*
Set RF Coupling to DC

Syntax



Description

The I1 *[one]* command sets the RF coupling to DC if your analyzer is capable of being switched. If your analyzer cannot be switched to DC coupling, the command will have no effect but an error message will not be generated.

Whether or not your analyzer can be AC coupled, DC coupled, or both depends on both the analyzer’s model number, and on whether or not Option UKB (Low Frequency Extension) has been installed. The tables below list the frequency specifications for all PSA analyzers for both DC and AC coupling.

Table 4-9 8568A/B Analyzer Frequency Coupling Specifications

	DC Coupled Range		AC Coupled Range	
Analyzer Model	**Min. Freq.**	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
8568A/B	100 Hz	1.5 GHz	100 kHz	1.5 GHz

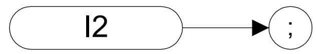
Table 4-10 PSA Series Analyzer Frequency Coupling Specifications

	DC Coupled Range		AC Coupled Range	
Analyzer Model (PSA series)	**Min. Freq.**	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
E4440A	3 Hz	26.5 GHz	10 MHz	26.5 GHz
E4443A	3 Hz	6.7 GHz	10 MHz	6.7 GHz
E4445A	3 Hz	13.2 GHz	10 MHz	13.2 GHz
E4446A	3 Hz	44 GHz	N/A	N/A
E4447A	3 Hz	42.98 GHz	N/A	N/A
E4448A	3 Hz	50 GHz	N/A	N/A

NOTE The PSA Series analyzers only have a single RF input port.

I2 *[two]*
Set RF Coupling to AC

Syntax



Description

The I2 *[two]* command sets the RF coupling to AC if your analyzer is capable of being switched. If your analyzer cannot be switched to AC coupling, the command will have no effect but an error message will not be generated.

Whether or not your analyzer can be AC coupled, DC coupled, or both depends on both the analyzer's model number, and on whether or not Option UKB (Low Frequency Extension) has been installed. The tables below list the frequency specifications for both DC and AC coupling.

Table 4-11 8568A/B Analyzer Frequency Coupling Specifications

	DC Coupled Range		AC Coupled Range	
Analyzer Model	**Min. Freq.**	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
8568A/B	100 Hz	1.5 GHz	100 kHz	1.5 GHz

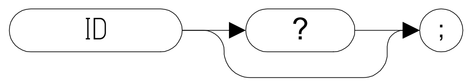
Table 4-12 PSA Series Analyzer Frequency Coupling Specifications

	DC Coupled Range		AC Coupled Range	
Analyzer Model (PSA series)	**Min. Freq.**	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
E4440A	3 Hz	26.5 GHz	10 MHz	26.5 GHz
E4443A	3 Hz	6.7 GHz	10 MHz	6.7 GHz
E4445A	3 Hz	13.2 GHz	10 MHz	13.2 GHz
E4446A	3 Hz	44 GHz	N/A	N/A
E4447A	3 Hz	42.98 GHz	N/A	N/A
E4448A	3 Hz	50 GHz	N/A	N/A

NOTE The PSA Series analyzers only have a single RF input port.

ID
Identify

Syntax



Description

The ID command returns the current model number of the spectrum analyzer to the controller.

If you are in SA mode, the response value is determined by your remote language selection. If you have a legacy language selected, the model number of the emulated instrument will be returned (for example, “HP8563E”). If you have SCPI selected, the model number of you PSA will be returned (for example, “E4440”).

If you are in any other mode, the response value will be the model number of your PSA regardless of the remote language selection.

The remote language is configured using the front-panel menu selection (**System**, **Config I/O**, **Configure Remote Lang**) and can also be set using the SCPI command SYSTem:LANGuage.

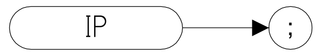
For more information see:

“Configuring Option 266 on PSA Analyzers” on page 37

“Running Software that Requires SCPI Commands” on page 45

IP
Instrument Preset

Syntax



Description

Performs an instrument preset, setting the analyzer back to its factory settings.

Instrument preset automatically occurs when you turn on the spectrum analyzer. IP is a good starting point for many measurement processes. When IP is executed remotely, the spectrum analyzer does not necessarily execute a complete sweep, however. You should execute a take sweep (TS) to ensure that the trace data is valid after an IP.

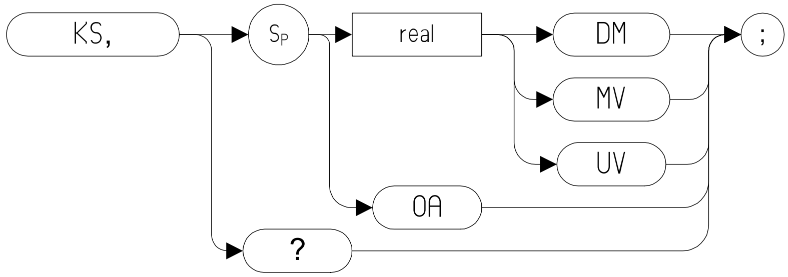
NOTE The functions of the IP command are identical to the KST command (page 217).

NOTE If the external amplifier gain has been set, executing an IP command will not reset this value. This is to protect the analyzer.

Programming Commands

KS, Mixer Level

Syntax



Description

The KS, command specifies the maximum signal level that is applied to the input mixer for a signal that is equal to or below the reference level.

The effective mixer level is equal to the reference level minus the input attenuator setting. When KS, is activated, the effective mixer level can be set from -10 dBm to -70 dBm in 10 dB steps.

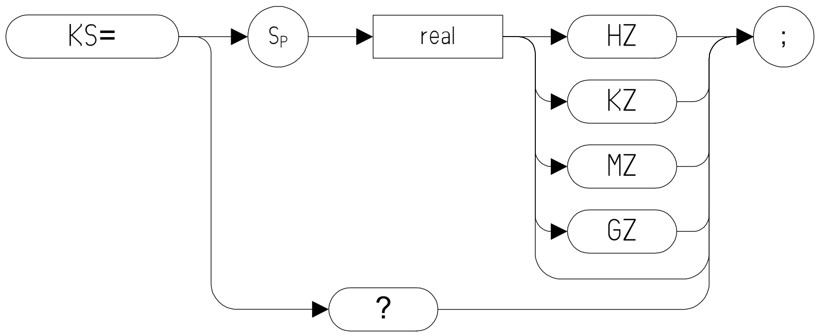
As the reference level is changed, the coupled input attenuator automatically changes to limit the maximum signal at the mixer input to your specified setting for signals less than or equal to the reference level.

NOTE If the external amplifier gain has been set, executing an IP command will not reset this value. This is to protect the analyzer.

NOTE The functions of the KS, command are identical to the ML command (page 283).

KS=
Marker Counter Resolution

Syntax



NOTE The marker counter can be specified in time units when operating in the time domain.

Description

Specifies the resolution of the marker frequency counter.

NOTE The functions of the KS= command are identical to the MKFCR command (page 263).

NOTE On PSA analyzers, setting the marker frequency resolution will cause the Gate Time to change. The Gate Time is calculated using the following formula:

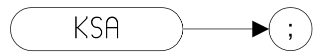
$$\text{Gate Time} = \frac{1}{\text{Resolution Value}}$$

For restrictions on the Gate Time, refer to the PSA *User's and Programmer's Reference, Volume 1*.

NOTE This command is only supported in the 8568 remote language. The same KS= command has a different function (selects the factory preselector setting) in the 8566 language, and is not supported.

KSA
Amplitude in dBm

Syntax



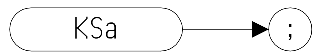
Description

The KSA command sets the amplitude readout (reference level, marker, display line and threshold) to dBm units.

NOTE The functions of the KSA command are identical to the AUNITS DBM command (page 119).

KSa
Normal Detection

Syntax



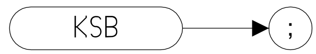
Description

The KSa command selects normal input detection. That is, it enables the *‘rosenfell’* detection algorithm that selectively chooses between positive and negative values.

NOTE The functions of the KSa command are identical to the DET NRM command (page 156).

KSB
Amplitude in dBmV

Syntax



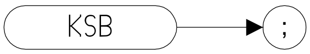
Description

The KSB command sets the amplitude readout (reference level, marker, display line and threshold) to dBmV units.

NOTE The functions of the KSB command are identical to the AUNITS DBMV command (page 119).

KSb
Positive Peak Detection

Syntax



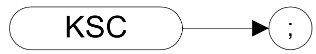
Description

The KSb command enables positive peak input detection for displaying trace information. Trace elements are only updated when the detected signal level is greater than the previous signal level.

NOTE The functions of the KSb command are identical to the DET POS command (page 156).

KSC
Amplitude in dBuV

Syntax



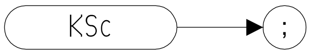
Description

The KSC command sets the amplitude readout (reference level, marker, display line and threshold) to dBuV units.

NOTE The functions of the KSC command are identical to the AUNITS DBUV command (page 119).

KSc
A Plus B to A

Syntax



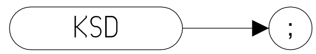
Description

The KSc command does a point-by-point addition of Trace A and Trace B, and sends the results to Trace A. Thus, if your input signal remains unchanged, KSc can restore the original trace after an AMB or a C2 command has been executed.

NOTE The functions of the command KSc are identical to the APB command (page 116).

KSD
Amplitude in Volts

Syntax



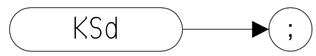
Description

The KSD command sets the amplitude readout (reference level, marker, display line and threshold) to voltage units.

NOTE The functions of the KSD command are identical to the AUNITS V command (page 119).

KSd
Negative Peak Detection

Syntax



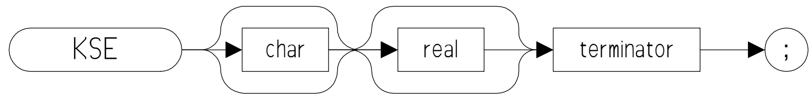
Description

The KSd command selects negative-peak input detection for displaying trace information. Each trace element is updated with the minimum value detected during the sweep.

NOTE The functions of the command KSd are identical to the DET NEG command (page 156).

KSE
Title Mode

Syntax



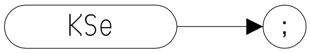
Description

The KSE command activates the title mode, writing a message to the top line of the display.

NOTE The only characters that Option 266 will accept as a terminator are the '@' character and the carriage return.

KSe
Sample Detection

Syntax



Description

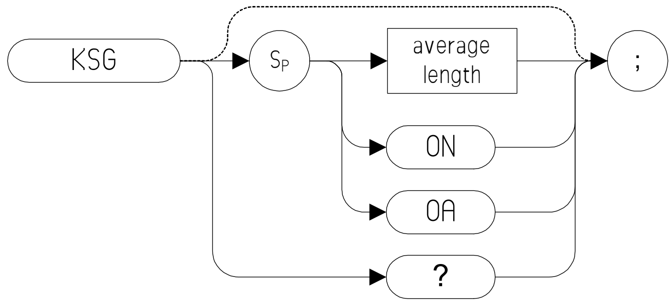
The KSe command selects sample input detection for displaying trace information.

NOTE The functions of the command KSe are identical to the DET SMP command (page 156).

Programming Commands

KSG
Video Averaging On

Syntax



Description

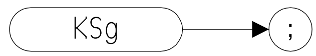
The KSG command enables video averaging. The averaged trace is displayed in Trace A.

If video averaging is off when either KSG? or KSG OA is sent to the instrument, video averaging is turned on and the current average count is returned to the controller.

NOTE The functions of the KSG command are identical to the VAVG ON command (page 363).

KSg
Display Off

Syntax



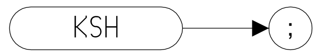
Description

The KSg command turns the analyzer's display Off.

NOTE On the legacy spectrum analyzers, this command turned the CRT beam power off to avoid unnecessary wear on the CRT. Although this command is supported, displays used on the PSA Series analyzers have a much longer life than the CRTs used in the legacy spectrum analyzers.

KSH
Video Averaging Off

Syntax



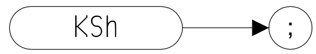
Description

The KSH command switches video averaging Off.

NOTE The functions of the KSH command are identical to the VAVG OFF command (page 363).

KSh
Display On

Syntax



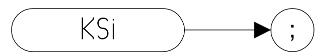
Description

The KSh command turns the analyzer’s display On.

NOTE On the early models of spectrum analyzers, CRT beam power was often switched Off to prevent wear of the CRT. This command (KSh) was used to turn the CRT beam power on again. Although this command is supported, displays used on the PSA Series analyzers have a much longer life than the CRTs used in the legacy spectrum analyzers.

KSI
Extend Analyzer Reference Level

Syntax

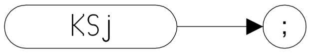


Description

The KSI command was used in the legacy analyzers to extend the analyzer reference level range. As the PSA analyzer already has a minimum reference level of –170 dBm and a maximum reference level of +30 dBm, this command has no effect in Option 266 Programming Code Compatibility Suite. Issuing this command will not generate an error in Option 266 Programming Code Compatibility Suite.

KSi
Exchange Trace B and Trace C

Syntax



Description

The KSi command exchanges Trace B data with Trace C data.

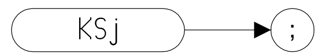
NOTE Trace C cannot be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data exchanged between Trace B and Trace C, you must follow the four step process below.

- Select single sweep mode (S2 (page 321) or SNGLS command (page 332))
- Select the desired analyzer settings
- Take one complete sweep using the TS command (page 362)
- Exchange the data

NOTE The functions of the command KSi are identical to the BXC command (page 133) and the XCH TRB,TRC command (page 371).

KSj
View Trace C

Syntax



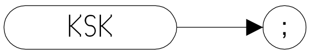
Description

The KSj command displays Trace C.

NOTE The functions of the command KSj are identical to the VIEW TRC command (page 369).

KSK
Marker to Next Peak

Syntax



Description

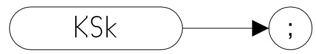
If there is a marker on the screen, the KSK command moves this marker to the next signal peak of lower amplitude.

NOTE The functions of the KSK command are similar to the MKPK NH command (page 270), except that KSK does not take into account the marker peak threshold value or the marker peak excursion value. For more details on marker peak threshold, see the MKPT command (page 271) and the TH command (page 351). For more details on marker peak excursion, see the MKPX command (page 272).

Programming Commands

KSk
Blank Trace C

Syntax



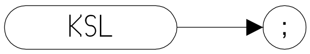
Description

The KSj command blanks Trace C.

NOTE The functions of the command KSk are identical to the BLANK TRC command (page 130))

KSL
Marker Noise Off

Syntax



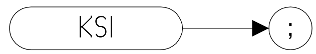
Description

The KSL command disables the noise density function which displays the RMS noise density at the marker. KSL does not blank the marker.

NOTE The functions of the KSL command are identical to the MKNOISE OFF command (page 266).

KSl
Transfer Trace B to Trace C

Syntax



Description

The KSl command transfers Trace B data to Trace C

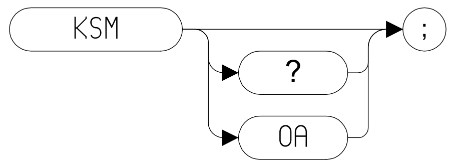
NOTE Trace C cannot be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data transferred from Trace B to Trace C, you must follow the four step process below.

- Select single sweep mode (S2 (page 321) or SNGLS command (page 332))
- Select the desired analyzer settings
- Take one complete sweep using the TS command (page 362)
- Transfer the data

NOTE The functions of the command KSl are identical to the BTC command (page 132).

KSM
Marker Noise On

Syntax



Description

The KSM command displays the noise density at the marker. The noise density is normalized to a 1Hz bandwidth.

NOTE The functions of the KSM command are identical to the MKNOISE ON command (page 266).

NOTE Some differences in marker noise may be seen between the legacy analyzers and the PSA Series analyzers due to the greater dynamic range of the PSA Series.

NOTE *All legacy analyzer languages:* If either the M3 command or the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

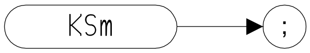
8566, 8568 and 8590 Series only: If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with that displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change in either the delta marker state or the marker noise state from the front panel.

8560 Series only: If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

NOTE The nominal noise bandwidth to RBW ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.

KSm
Graticule Off

Syntax



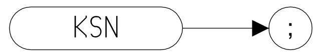
Description

The KSm command blanks the graticule on the analyzer display.

NOTE The functions of the command KSm are identical to the GRAT OFF command (page 180).

KSN
Marker Minimum

Syntax



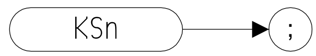
Description

The KSN command moves the marker to the minimum value detected.

NOTE The functions of the KSN command are identical to the MKMIN command (page 264).

KSn
Graticule On

Syntax



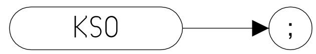
Description

The KSn command turns on the graticule on the analyzer display.

NOTE The functions of the command KSn are identical to the GRAT ON command (page 180).

KSO
Marker Span

Syntax



Description

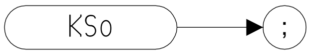
The KSO command operates only when the delta marker is On (see MKD (page 259) or M3 (page 242)). When the delta marker is on and the KSO command is executed, the left marker specifies the start frequency, and the right marker specifies the stop frequency. If the delta marker is off, the command does nothing.

NOTE If the active marker is not a delta marker, there is no change in its position.

NOTE The functions of the KSO command are identical to the MKSP command (page 276).

KSo
Annotation Off

Syntax



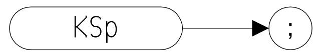
Description

The KSo command blanks the annotation on the analyzer display.

NOTE The functions of the command KSo are identical to the ANNOT OFF command (page 115).

KSp
Annotation On

Syntax



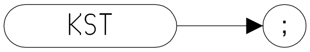
Description

The KSp command activates the annotation on the analyzer display.

NOTE The functions of the command KSp are identical to the ANNOT ON command (page 115).

KST
Fast Preset

Syntax



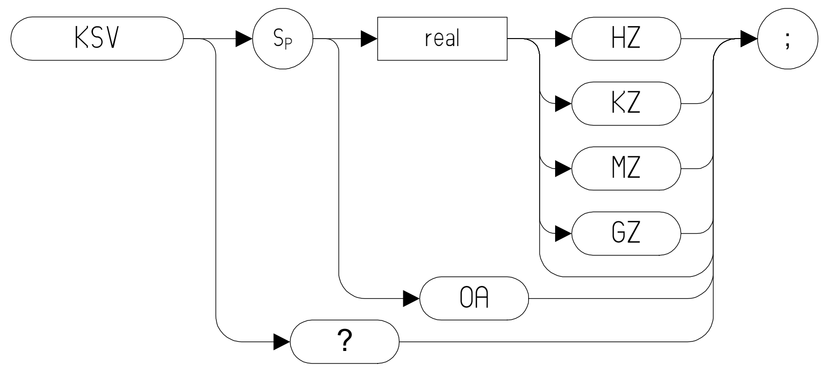
Description

Performs an instrument preset, setting the analyzer back to its factory settings.

NOTE There is no fast preset for the PSA series analyzers. Instead, the Code Compatibility software performs an instrument preset (IP) when the KST command is issued. The functions of the command KST are therefore identical to the IP command (page 185).

KSV
Frequency Offset

Syntax



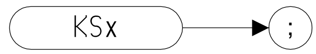
Description

The KSV command allows you to specify a value that offsets the frequency scale for all absolute frequency readouts, for example, center frequency. Relative values, for example, span and delta marker, are not offset.

NOTE The functions of the KSV command are identical to the FOFFSET command (page 175).

KSx
External Trigger

Syntax



Description

The KSx command activates the normal external trigger mode. When the KSx command is executed, the RF input signal is only displayed when the external trigger level exceeds the trigger threshold level.

NOTE If an 8566A/B or an 8568A/B analyzer is in zero span and the sweep time is less than 20 msec, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

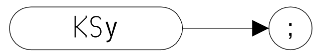
Equally, if any of the 8560-E Series of analyzers, that is the 8560E, 8561E, 8563E, 8564E and the 8565E, are in zero span and with a sweep time of less than 50 msec, and they do not have Option 007 - Fast Digitized Time Domain installed, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

In Option 266, all traces are displayed continuously, so all traces are therefore free of flicker.

NOTE The functions of the command KSx are identical to the TM EXT command (page 354).

KSy
Video Trigger

Syntax



Description

The KSy command activates the normal video trigger mode. When the KSy command is executed, the RF input signal is only displayed when the video trigger signal, which is internally triggered off the input signal, exceeds the trigger threshold level.

NOTE If an 8566A/B or an 8568A/B analyzer is in zero span and the sweep time is less than 20 msec, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

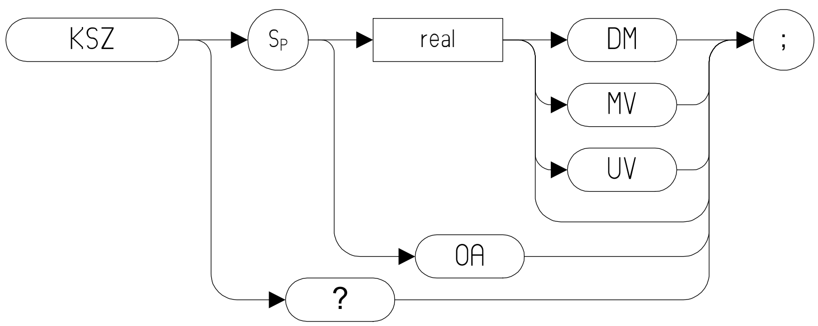
Equally, if any of the 8560-E Series of analyzers, that is the 8560E, 8561E, 8563E, 8564E and the 8565E, are in zero span and with a sweep time of less than 50 msec, and they do not have Option 007 - Fast Digitized Time Domain installed, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

In Option 266, all traces are displayed continuously, so all traces are therefore free of flicker.

NOTE The functions of the command KSy are identical to the TM VID command (page 354) and to the T4 command (page 347).

KSZ
Reference Level Offset

Syntax



Description

The KSZ command offsets all amplitude readouts on the display but without affecting the trace.

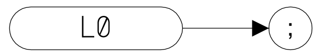
Once activated, the KSZ command displays the amplitude offset on the left side of the screen.

Entering KSZ 0 or presetting the spectrum analyzer eliminates an amplitude offset.

NOTE The functions of the KSZ command are identical to the ROFFSET command (page 318).

L0 *[zero]*
Display Line Off

Syntax



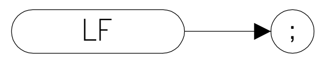
Description

The L0 *[zero]* command disables the display line.

NOTE The functions of the L0 *[zero]* command are identical to the DLE OFF command (page 160).

LF
Low Frequency Preset

Syntax



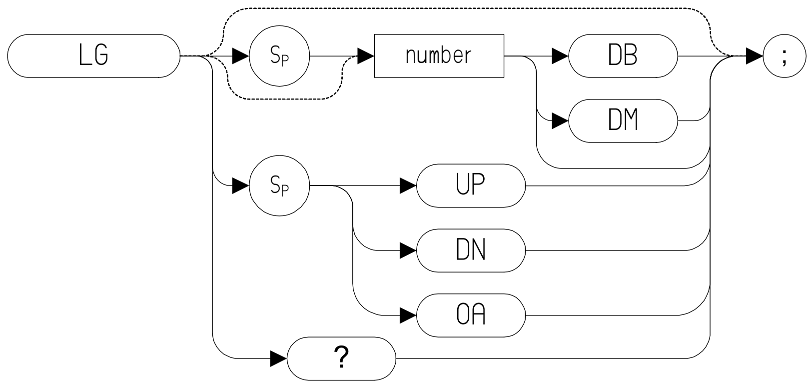
Description

Performs a low frequency preset. That is, it selects a Start Frequency of 0 Hz and a Stop Frequency of 2.5 GHz, a Reference Level of 0dBm, and sets all coupled functions to automatic.

NOTE If you are using an E4401B or E4411B analyzer, the Stop Frequency will be clipped to the limits of the analyzer, that is 1.5 GHz.

LG
Logarithmic Scale

Syntax



Description

Specifies the amplitude (vertical graticule divisions) as logarithmic units, without changing the reference level. The integer ranges vary between the different remote languages. The following table lists the ranges for each remote language.

Table 4-13

Remote Language	Integer Range using the LG Command
8560E/EC	1, 2, 5, and 10
8561E/EC	1, 2, 5, and 10
8562E/EC	1, 2, 5, and 10
8563E/EC	1, 2, 5, and 10
8564E/EC	1, 2, 5, and 10
8565E/EC	1, 2, 5, and 10
8566A	1, 2, 5, and 10
8566B	1, 2, 5, and 10
8568A	1, 2, 5, and 10
8568B	1, 2, 5, and 10
8590L	0.1 dB to 20.0 dB
8591E	0.1 dB to 20.0 dB

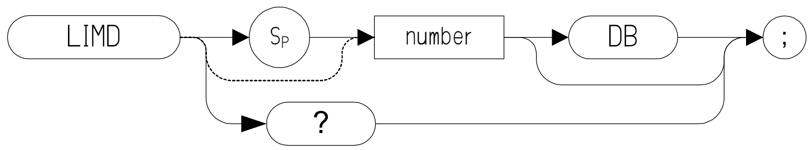
Table 4-13

Remote Language	Integer Range using the LG Command
8592L	0.1 dB to 20.0 dB
8593E	0.1 dB to 20.0 dB
8594E	0.1 dB to 20.0 dB
8594L	0.1 dB to 20.0 dB
8595E	0.1 dB to 20.0 dB
8596E	0.1 dB to 20.0 dB

Programming Commands

LIMD
Limit Line Delta Value

Syntax



Description

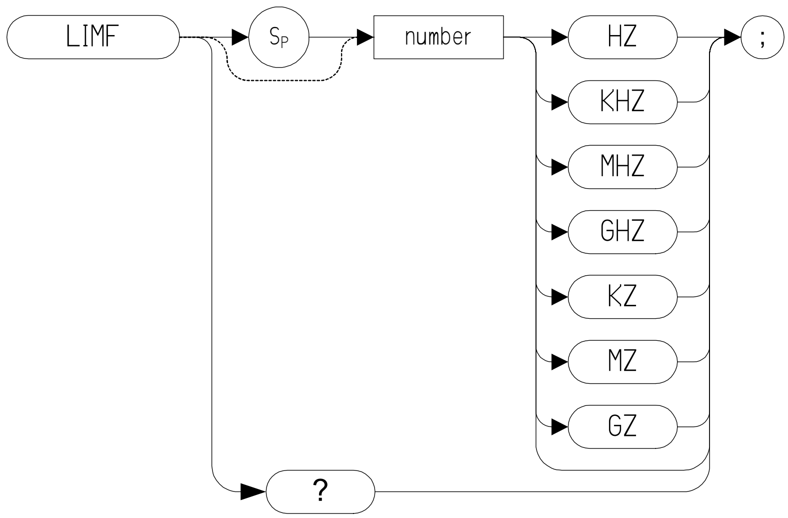
The LIMD command is used to enter the delta value for the amplitude of a limit line segment.

NOTE The response to the query command LIMD? is the delta value for the segment currently selected with the SEDI command (page 326).

Programming Commands

LIMF
Limit Line Frequency Value

Syntax



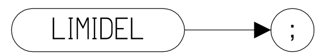
Description

The LIMF command is used to enter a frequency value for a limit-line segment.

NOTE The response to the query command LIMF? is the delta value for the segment currently selected with the SEDI command (page 326).

LIMIDEL
Delete Limit Line Table

Syntax

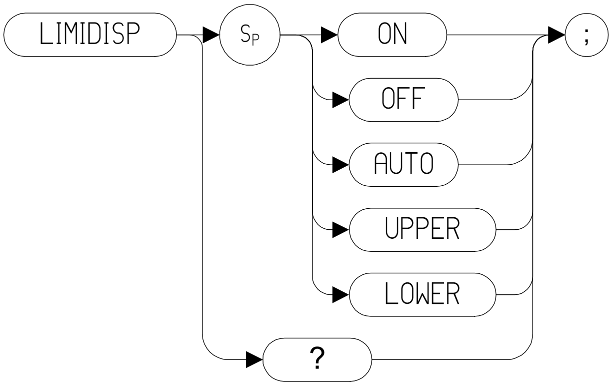


Description

The LIMIDEL command deletes all upper and lower segments in the current limit-line table.

LIMIDISP
Limit Line Display

Syntax

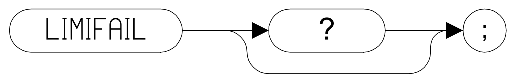


Description

Controls the display of the limit line (or limit lines).

LIMIFAIL
Limits Failed

Syntax



Description

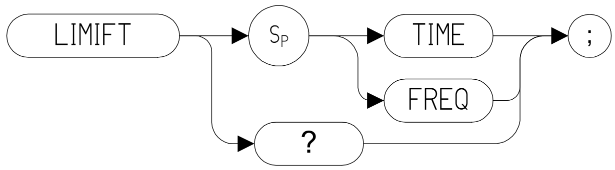
The LIMIFAIL command returns a number between 0 and 3 which specifies whether the active trace passed or failed the upper and lower limit line tests. The meanings of the returned numbers are shown below.

Table 4-14 Results of the LIMIFAIL Command

Result	Meaning
0	The active trace passed both the upper and the lower limit tests.
1	The active trace failed the lower limit test.
2	The active trace failed the upper limit test.
3	The active trace failed both the upper and the lower limit tests.

LIMIFT
Select Frequency or Time Limit Line

Syntax



Description

The LIMIFT command determines how the limit-line segments are defined. They can be defined according to frequency, or according to the sweep time setting of the spectrum analyzer.

LIMIPURGE
Delete Current Limit Line

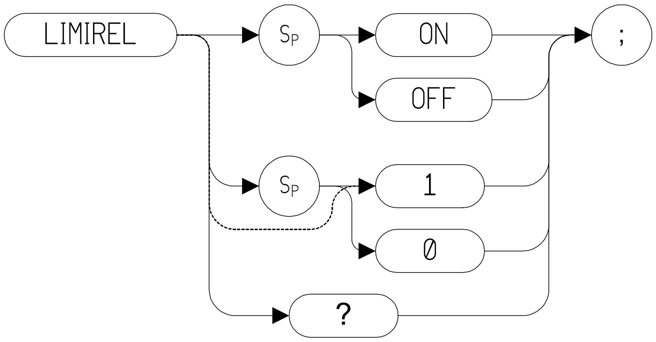
Syntax

Description

The LIMIPURGE command deletes the current limit line.

LIMIREL
Relative Limit Lines

Syntax

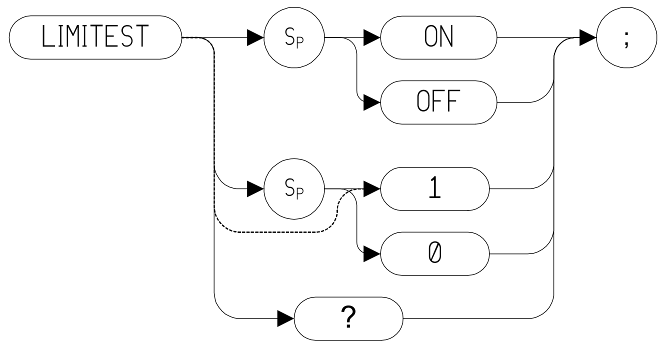


Description

Specifies whether the current limit lines are fixed or relative.

LIMITEST
Enable Limit Line Testing

Syntax

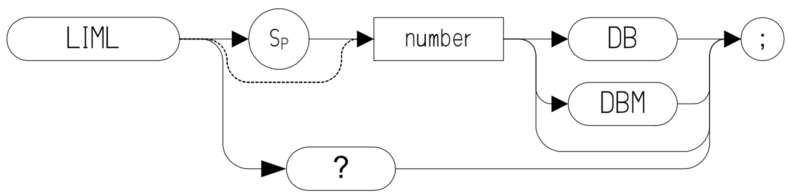


Description

The LIMITEST command compares trace A with the current limit line data.

LIML
Lower-Limit Amplitude

Syntax



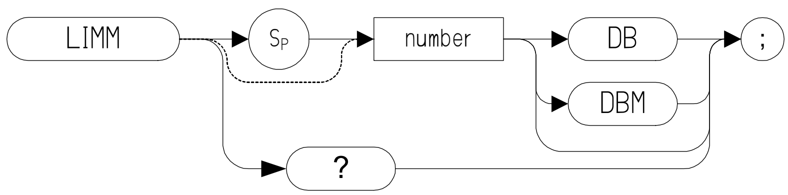
Description

The LIML command is used within the SEDI command (page 326) to assign the lower-limit amplitude value to a limit-line segment.

Programming Commands

LIMM
Limit Middle-Amplitude

Syntax

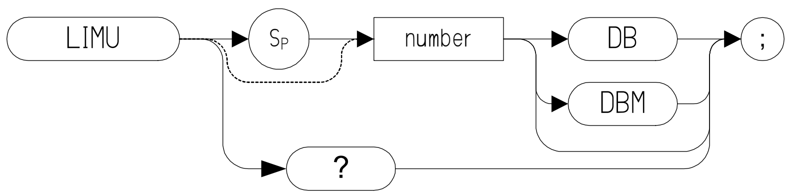


Description

The LIMM command is used within the SEDI command (page 326) to assign the middle amplitude value to a limit-line segment.

LIMU
Upper-Limit Amplitude

Syntax

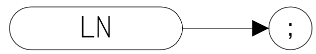


Description

The LIMU command is used within the SEDI command (page 326) to assign the upper-limit amplitude value to a limit-line segment.

LN
Linear Scale

Syntax

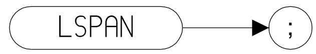


Description

Scales the amplitude (vertical graticule divisions) proportional to the input voltage, without changing the reference level. The bottom line of the graticule represents 0 volts.

LSPAN
Previous Span

Syntax

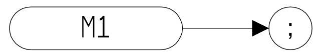


Description

The LSPAN command changes the spectrum analyzer's span to the previous span setting.

M1 *[one]*
Marker Off

Syntax



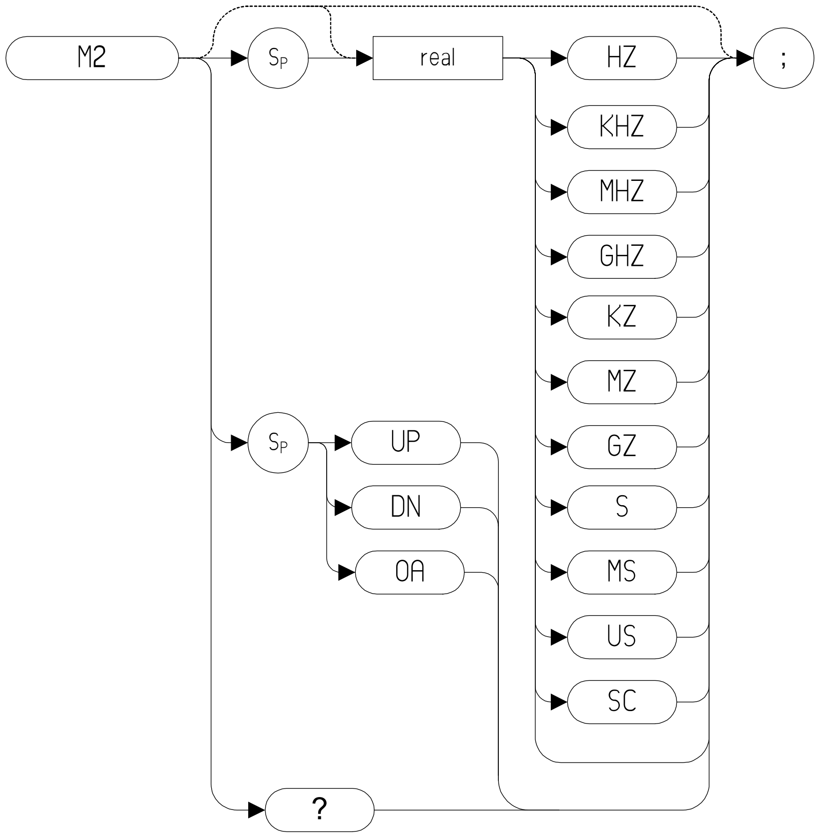
Description

The M1 *[one]* command blanks any markers showing on the display.

NOTE The functions of the M1 *[one]* command are identical to the MKOFF ALL command (page 268).

M2 *[two]* Marker Normal

Syntax



Description

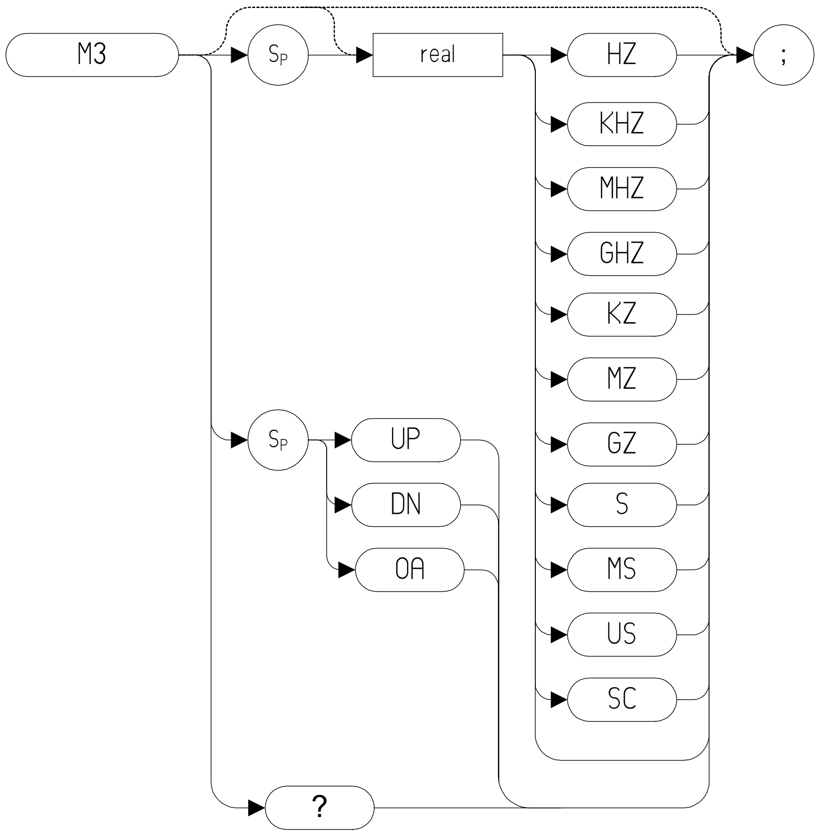
The M2 *[two]* command moves the active marker to the marker frequency. If the active marker type is not currently normal (for example, it is delta or peak), the M2 command will change it to a normal marker.

NOTE The functions of the M2 command are identical to the MKN command (page 265).

NOTE Model numbers 8566, 8588, and the 8590 Series only: If the active marker has not been declared with MKACT, a normal marker is turned on and this active marker is assumed to be marker number 1 *[one]*.

M3 *[three]*
Delta Marker

Syntax



Description

The M3 *[three]* command computes the frequency and amplitude difference between the active marker and the delta (or difference) marker.

If a delta marker is not displayed on the screen, the M3 command places one at the specified frequency or on the right hand edge of the display. If an active marker is not displayed on the screen, the M3 command places an active marker at the center of the screen.

NOTE The active marker is the number 1 marker unless otherwise specified by the MKACT command (page 256).

NOTE *All legacy analyzer languages:* If the M3 command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

8566, 8568 and 8590 Series only: If the M3 command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with that displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change in either the delta marker state or the marker noise state from the front panel.

8560 Series only: If the M3 command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

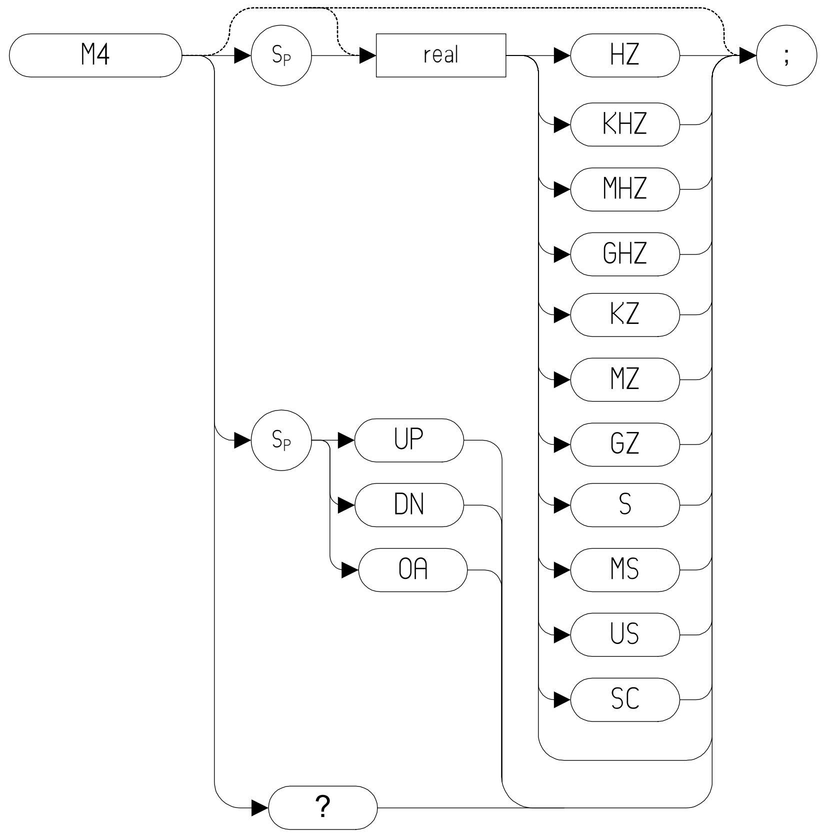
NOTE The nominal ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.

NOTE The functions of the M3 command are identical to the MKD command (page 259).

Programming Commands

M4 *[four]*
Marker Zoom

Syntax



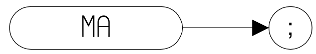
Description

The M4 *[four]* command, when specifying either the UP or DN parameter, increases or decreases the frequency span by one step. When specifying a numeric value, the M4 command moves the markers horizontal (X) position to the specified position in frequency or time.

NOTE The OA option only returns the current value to the controller; it does not set the active function to the active marker.

MA
Marker Amplitude Output

Syntax



Description

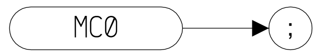
The MA command returns the amplitude level of the active marker if the marker is on the screen. If both the active marker and the delta marker are displayed, the MA command returns the amplitude difference between the two markers.

NOTE The format of the returned data when using the MKA command is dependent on the currently set trace data format (refer to TDF, MDS, O1, O2, O3, or O4) when the selected remote language is either 8566 or 8590. When the selected remote language is 8560, the marker amplitude is always returned as an ASCII value (TDF P).

NOTE The functions of the MA command are identical to the MKA command (page 255).

MC0 *[zero]*
Marker Frequency Counter Off

Syntax



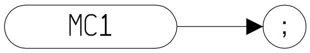
Description

The MC0 *[zero]* command turns the marker frequency counter off.

NOTE The functions of the MC0 *[zero]* command are identical to the MKFC OFF command (page 262).

MC1 *[one]*
Marker Frequency Counter On

Syntax



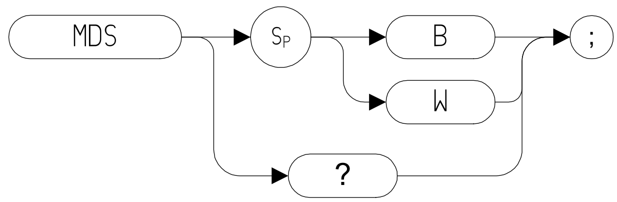
Description

The MC1 *[one]* command turns the marker frequency counter on.

NOTE The functions of the MC1 *[one]* command are identical to the MKFC ON command (page 262).

MDS
Measurement Data Size

Syntax



Description

The MDS command formats binary data in one of the following formats:

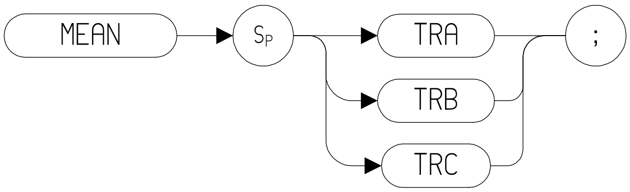
B selects a data size of one 8-bit byte.

W selects a data size of one word, which is two 8-bit bytes.

If no keyword is specified in the command, the default value of W is assumed.

MEAN
Trace Mean

Syntax



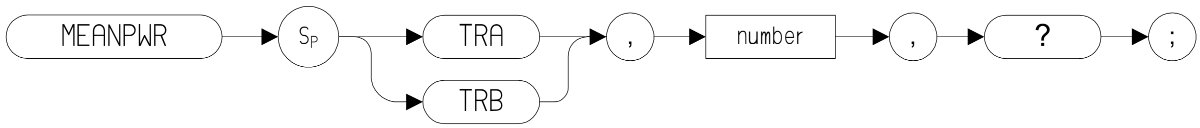
Description

Returns the mean value of the specified trace in display units.

NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

MEANPWR
Mean Power measurement

Syntax



Description

The MEANPWR command measures the average power of the carrier during that portion of the time when it is on. The on state is defined as the time when the signal is within a selected number of dB of its peak level. The range of amplitudes that is defined as the on state can be set with the command. The amplitude range is set relative to the peak value of the signal.

NOTE The MEANPWR command is similar to the CARRON command (page 138), except that the CARRON command defines 'on' as that time when the signal is within 20dB of its peak level.

MEASOFF
Measurement Off

Syntax

Description

Turns the current measurement off if the current measurement is ACP (page 93) or CHP (page 142).

NOTE If ACPPAR (page 105) is set to automatic, the MEASOFF command returns the following settings back to their pre-measurement states:

- Frequency span
- Resolution bandwidth
- Video bandwidth
- Center frequency step size
- Sweep time
- Detector mode
- Amplitude scale

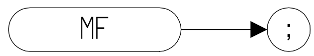
It does not do any of the following:

- Change the values of ACPSP or ACPBW
- Restore trace elements
- Restore trigger mode
- Restore Amplitude units
- Restore any trace math functions

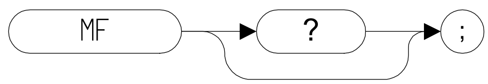
MF
Marker Frequency Output

Syntax

8566 and 8568 Remote Language



8560 Series and 8590 Series Remote Language



Description

Returns the frequency (or time) of the on-screen active marker. If both an active marker and the delta marker are on the screen, the frequency difference is returned.

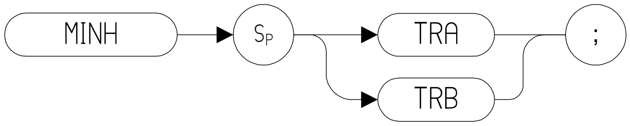
NOTE

8566 and 8568 only: If the active marker has marker frequency count set to *On* when using the MF? command, the marker frequency count value is returned to the controller.

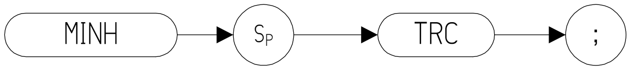
MINH
Minimum Hold

Syntax

8560 Series Remote Language



8590 Series Remote Language

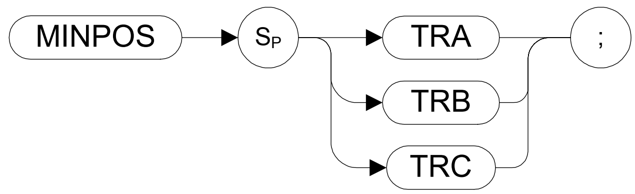


Description

The MINH command updates the chosen trace with the minimum signal level detected at each trace-data point from subsequent sweeps.

MINPOS
Minimum X Position

Syntax



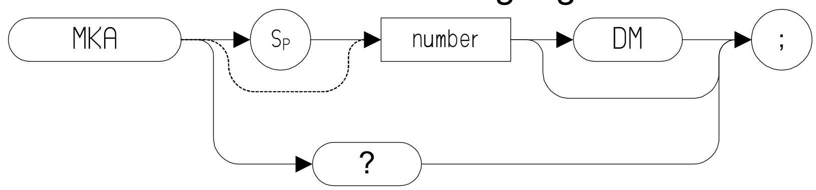
Description

The MINPOS command returns the *X* co-ordinate value that corresponds to the minimum amplitude of the specified trace.

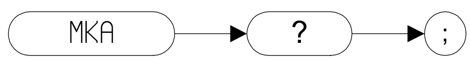
MKA
Marker Amplitude

Syntax

8566 and 8568 Remote Language



8560 Series and 8590 Series Remote Language



Description

8566 and 8568: Specifies the amplitude of the active marker in dBm when the active marker is the fixed or amplitude type (refer to the MKTYPE command).

8560 and 8590: Returns the amplitude of the active marker. For further details, refer to the MA command.

NOTE The format of the returned data when using the MKA command is dependent on the currently set trace data format (refer to TDF, MDS, O1, O2, O3, or O4) when the selected remote language is either 8566 or 8590. When the selected remote language is 8560, the marker amplitude is always returned as an ASCII value (TDF P).

NOTE The functions of the MKA command are identical to the MA command (page 245).

NOTE In the 8566, 8568, and in the 8590 Series analyzers, the MKA command can be used with a numeric argument that places the marker at the specified amplitude on the screen. For the 8566 and 8568, the MKA command will only accept a value in PSA Series analyzers with firmware Rev. A.08.08 or later. In Option 266 Programming Code Compatibility, MKA is a query only command. That is, the command will not accept arguments of any type, and can only be used in the form MKA?.

Programming Commands

MKACT
Activate Marker

Syntax

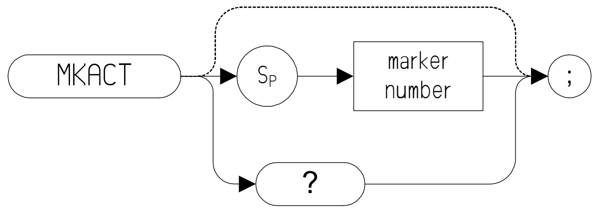


Table 4-15

Item	Description/Default	Range
Marker Number	Any valid integer. Default value is 1.	1 to 4

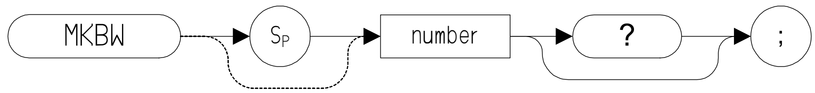
Description

MKACT specifies the active marker. There can be four different markers, but only one marker can be active at any time.

Programming Commands

MKBW
Marker Bandwidth

Syntax

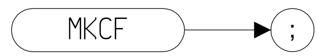


Description

Returns the bandwidth at the specified power level relative to an on-screen marker (if present) or the signal peak (if no on-screen marker is present).

MKCF
Marker to Center Frequency

Syntax



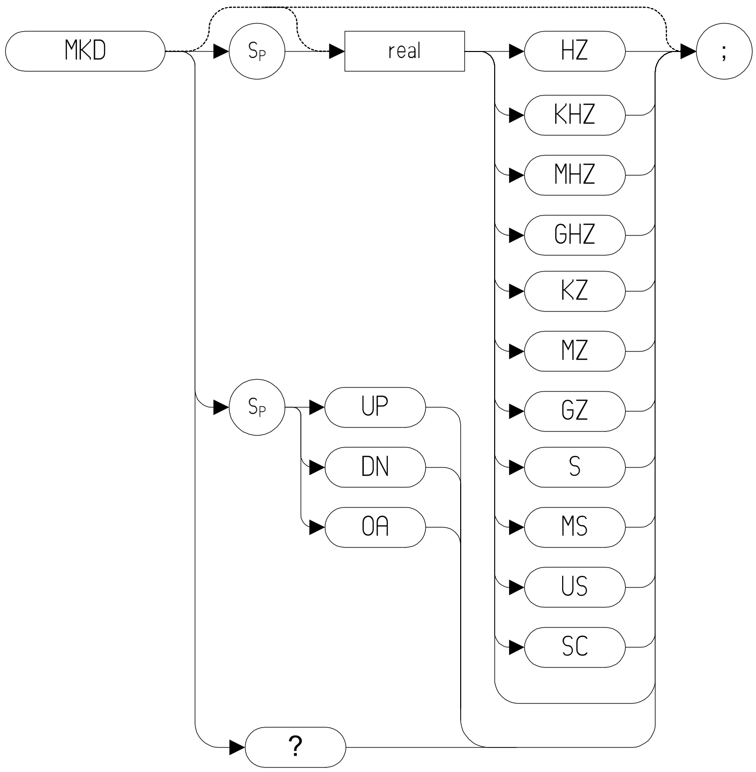
Description

Sets the center frequency equal to the marker frequency and moves the marker to the center of the screen.

NOTE The functions of the MKCF command are identical to the E2 command (page 164).

MKD
Marker Delta

Syntax



Step Increment: by 1/10 of the frequency span

Description

The MKD command computes the frequency and amplitude difference of the active marker and the delta marker. These values are displayed in the screen.

If a delta marker is not displayed on the screen, the MKD command places one at the specified frequency or on the right hand edge of the display. If an active marker is not displayed on the screen, the MKD command places an active marker at the center of the screen.

NOTE The active marker is the number 1 marker unless otherwise specified by the MKACT command (page 256).

NOTE

All legacy analyzer languages: If the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

8566, 8568 and 8590 Series only: If the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with that displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change in either the delta marker state or the marker noise state from the front panel.

8560 Series only: If the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

NOTE

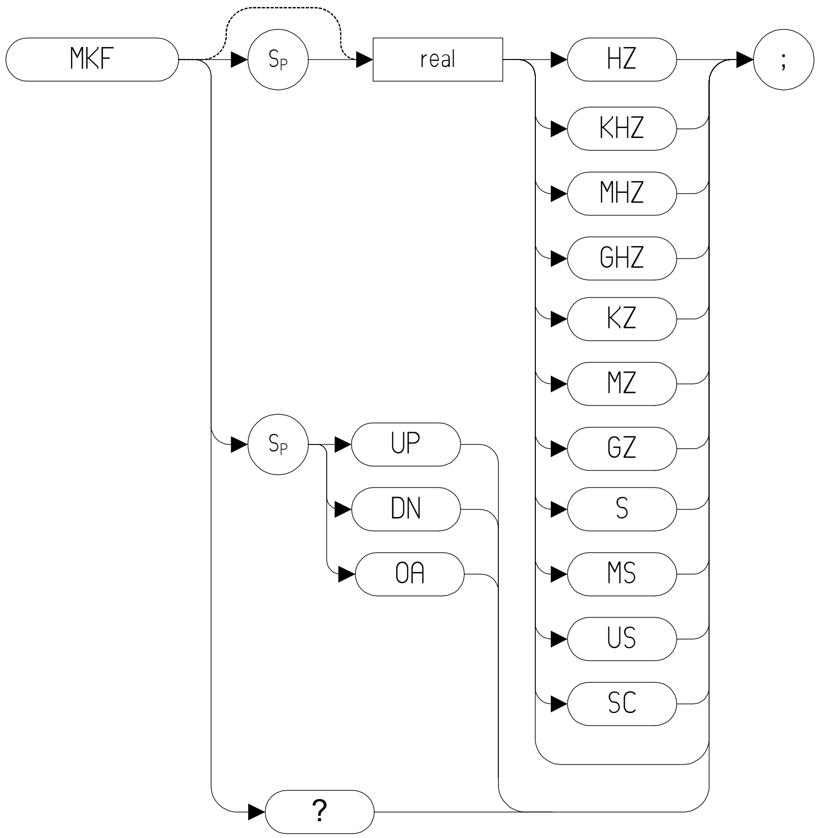
The nominal ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.

NOTE

The functions of the MKD command are identical to the M3 command (page 242).

MKF Marker Frequency

Syntax



Description

Specifies the frequency value of the active marker.

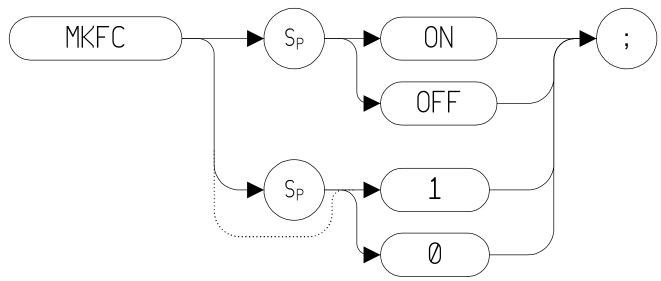
NOTE With the 8560 Series languages, the data is always returned in ASCII format.

WIth all other languages, the format of the returned data is determined by the TDF (Trace Data Format) (page 350) command and, if TDF B (binary data format) has been selected, by the MDS command (page 248).

8566 and 8568 only: If the active marker has marker frequency count set to *On* when using the MKF? command, the marker frequency count value is returned to the controller.

MKFC
Marker Counter

Syntax



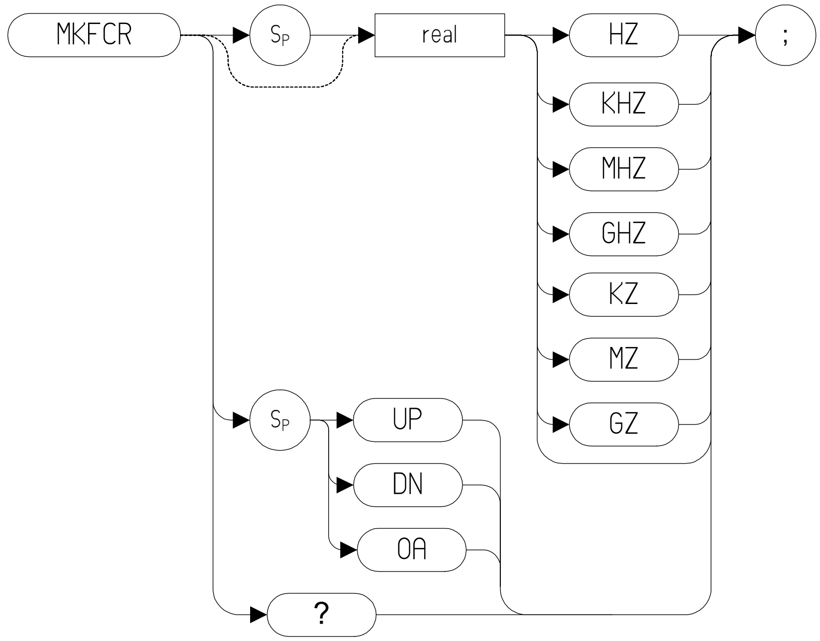
Description

Turns on or off the marker frequency counter. The resolution of the frequency marker counter is determined by the MKFCR command (page 263).

NOTE The functions of the MKFC command are identical to the MC0 *[zero]* command (page 246) and MC1 *[one]* command (page 247).

MKFCR
Marker Counter Resolution

Syntax



NOTE The marker counter can be specified in time units when operating in the time domain

Description

Sets the resolution of the marker frequency counter. The marker counter value is always given either in Hertz or in seconds depending on whether the analyzer is operating in the frequency domain or the time domain.

NOTE On PSA analyzers, setting the marker frequency resolution will cause the Gate Time to change. The Gate Time is calculated using the following formula:

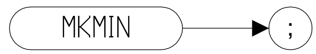
$$\text{Gate Time} = \frac{1}{\text{Resolution Value}}$$

For restrictions on the Gate Time, refer to the PSA *User's and Programmer's Reference, Volume 1*.

NOTE The functions of the MKFCR command are identical to the KS= command (page 187).

MKMIN
Marker Minimum

Syntax



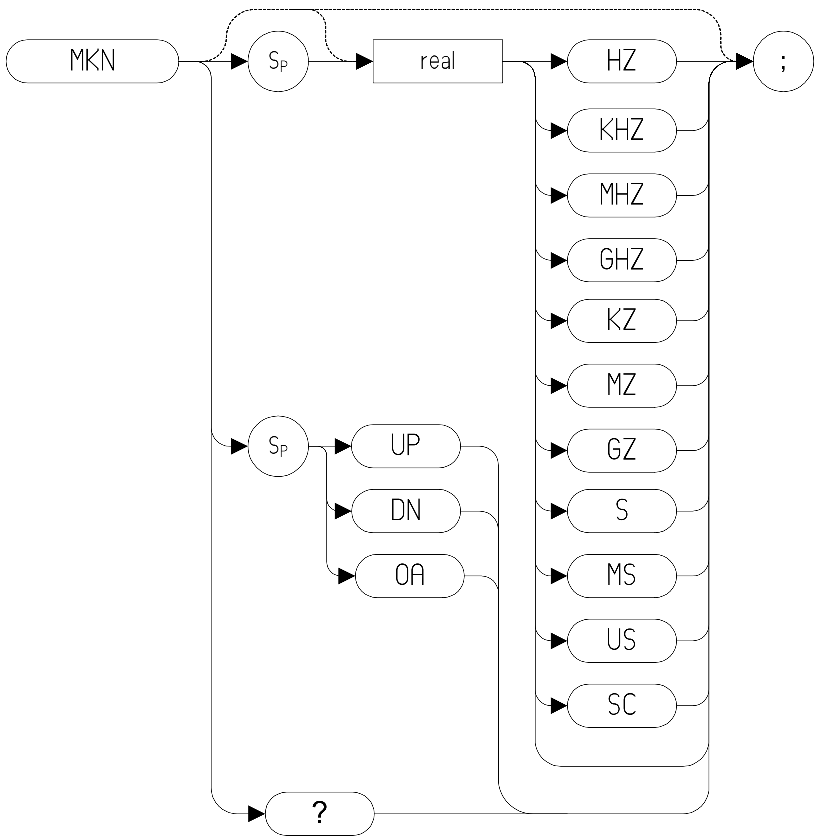
Description

Moves the active marker to the minimum value detected.

NOTE The functions of the MKMIN command are identical to the KSN command (page 212).

MKN
Marker Normal

Syntax



Step Increment: by 1/10 of the frequency span.

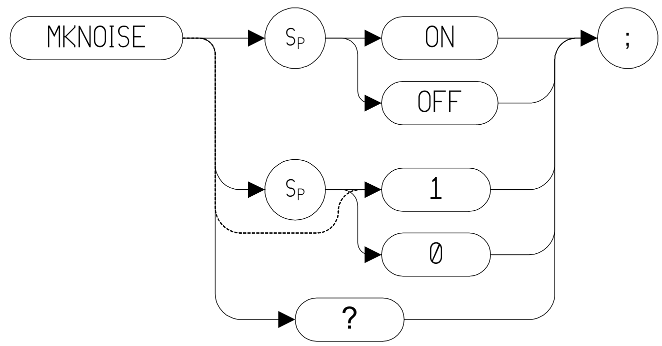
Description

The MKN command moves the active marker to the specified frequency. If the active marker has not been declared with MKACT, a normal marker is turned on and this active marker is assumed to be 1. If the active marker type is not currently normal (for example, it is delta or peak), the MKN command will change it to a normal marker.

NOTE The functions of the MKN command are identical to the M2 *[two]* command (page 241).

MKNOISE
Marker Noise

Syntax



Description

Displays the average RMS noise density at the marker.

NOTE The functions of the MKNOISE command are identical to the KSM command (page 209) and the KSL command (page 207).

NOTE Some differences in marker noise may be seen between the legacy analyzers and the PSA Series analyzers due to the greater dynamic range of the PSA Series.

NOTE *All legacy analyzer languages:* If either the M3 command or the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

8566, 8568 and 8590 Series only: If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with those displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change in either the delta marker state or the marker noise state from the front panel.

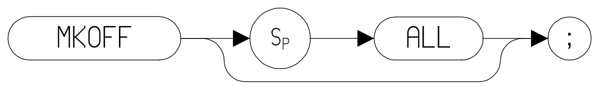
8560 Series only: If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

NOTE The nominal ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.

Programming Commands

MKOFF
Marker Off

Syntax



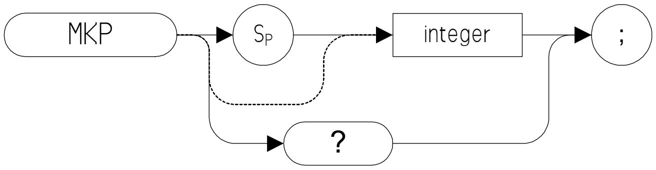
Description

Turns off either the active marker or all the markers. If the ALL parameter is omitted, only the active marker is turned off.

Programming Commands

MKP
Marker Position

Syntax

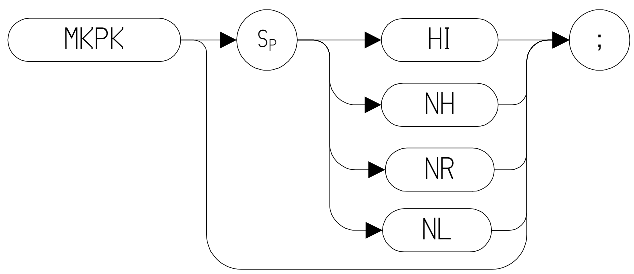


Description

Places the active marker at the specified *X* co-ordinate.

MKPK
Marker Peak

Syntax



Description

Executing MKPK HI, or simply MKPK (no secondary keyword), positions the active marker at the highest signal detected. If an active marker is on the screen, the MKPK parameters move the marker as follows:

HI (highest) moves the active marker to the highest peak.

NH (next highest) moves the active marker to the next signal peak of lower amplitude.

NR (next right) moves the active marker to the next signal peak to the right of the current marker.

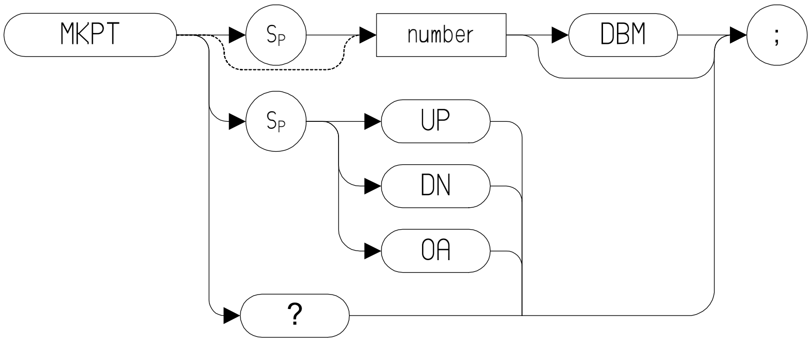
NL (next left) moves the active marker to the next signal peak to the left of the current marker.

NOTE The functions of the MKPK command (no secondary keyword) and the MKPK HI command are identical to the E1 commands: (page 163).

NOTE The functions of the MKPK NH command are similar to the KSK command (page 205), except that KSK does not take in to account the marker peak excursion or marker peak threshold values. For more details on marker peak excursion, see the MKPX command (page 272).

MKPT
Marker Threshold

Syntax



Description

The MKPT command sets the minimum amplitude level from which a peak on the trace can be detected.

NOTE The default values and the range settings on Option 266 Programming Code Compatibility are different than on the legacy analyzers. The following table shows the differences.

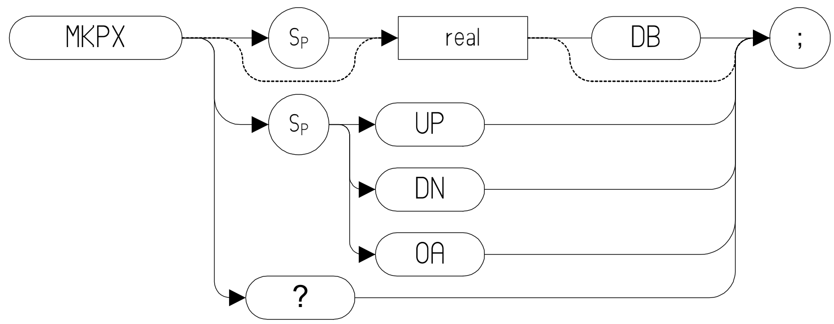
Table 4-16 Range Settings and Default Values with the MKPT Command

Remote Language	Default Setting on Original Analyzer	Default Setting on PSA analyzers	Valid Range on Legacy Analyzer	Valid Range on PSA analyzers
8560E/EC Series analyzers	−130 dBm	−100 dBm	–200 dBm to 30 dBm	Ref Level to (Ref Level - (10 × Scale per Division))

Programming Commands

MKPX
Marker Peak Excursion

Syntax



Preset State: 6 dB.

Step Increment: by 1 dB.

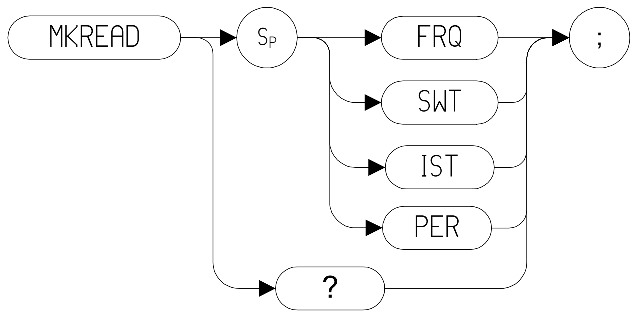
Description

Specifies the minimum signal excursion for the spectrum analyzer's internal peak identification routine.

The default value is 6 dB. In this case, any signal with an excursion of less than 6 dB on either side of the marker would not be identified. Thus, if an MKPK NH command were to be executed on such a signal, the analyzer would not place a marker on this signal peak.

MKREAD
Marker Readout

Syntax



Description

Selects the type of active trace information displayed by the spectrum analyzer marker readout.

The MKREAD command can select the following types of active trace information:

FRQ frequency

SWT sweep time

IST inverse sweep time

PER period

NOTE The Inverse Sweep Time (IST) readout is only available when using a delta marker in zero span.

The results of the data depend on the MKREAD parameter and the frequency span, and whether the marker delta function is used.

Table 4-17

MKREAD Type	Non-Zero Span	Non-Zero Span Delta	Zero Span	Zero Span Delta
FRQ	Reads frequency	Reads delta frequency	N/A	N/A
SWT	Reads time since the start of sweep	Reads delta time between end points	Waveform measurements of detected modulation	Waveform measurements of detected modulation

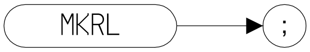
Table 4-17

MKREAD Type	Non-Zero Span	Non-Zero Span Delta	Zero Span	Zero Span Delta
IST	N/A	N/A	N/A	Computes frequency corresponding to delta of markers. Performs $1/(T_1 - T_2)$
PER	Period of frequency	(Pulse measurement) delta time	N/A	N/A

NOTE FFT (Fast Fourier Transform) is not available in the Programming Code Compatibility Suite option.

MKRL
Marker to Reference Level

Syntax



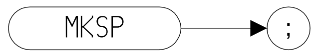
Description

The MKRL command moves the active marker to the reference level.

NOTE The functions of the MKRL command are identical to the E4 command (page 166).

MKSP
Marker to Span

Syntax



Description

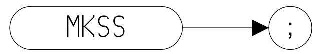
The MKSP command operates only when the delta marker is On (see MKD (page 259) or M3 (page 242)). When the delta marker is On and MKSP is executed, the delta marker and active marker determine the start and stop frequencies. The left marker specifies the start frequency, and the right marker specifies the stop frequency. If marker delta is Off, there is no operation.

NOTE If the active marker is not a delta marker, there is no change in its position.

NOTE The functions of the MKSP command are identical to the KSO command (page 214).

MKSS
Marker to Step Size

Syntax



Description

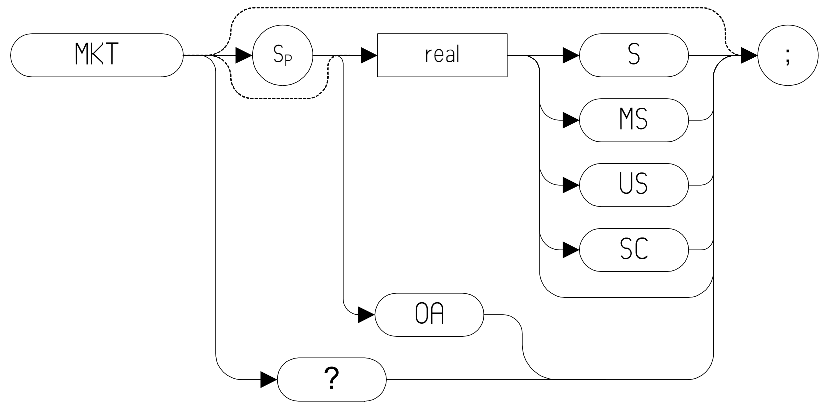
Sets the center-frequency step-size equal to the marker frequency. If the analyzer is in the delta mode, the step size is set to the frequency difference between the active and the delta marker.

NOTE When the marker is a delta marker, the functions of the MKSS command are identical to the E3 command (page 165).

Programming Commands

MKT
Marker Time

Syntax



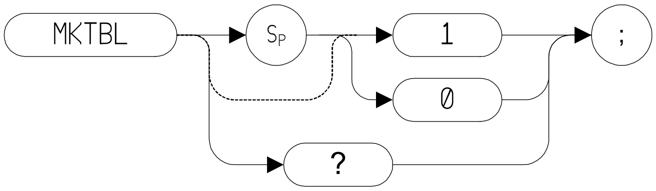
Description

Places a marker at a position that corresponds to a specified point in time during the sweep.

NOTE The default unit of time is seconds (‘S’ or ‘SC’).

MKTBL
Marker Table

Syntax



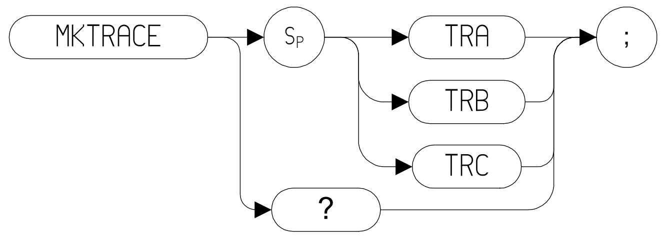
Description

The MKTBL command turns the display of the marker table on or off.

Programming Commands

MKTRACE
Marker Trace

Syntax



NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

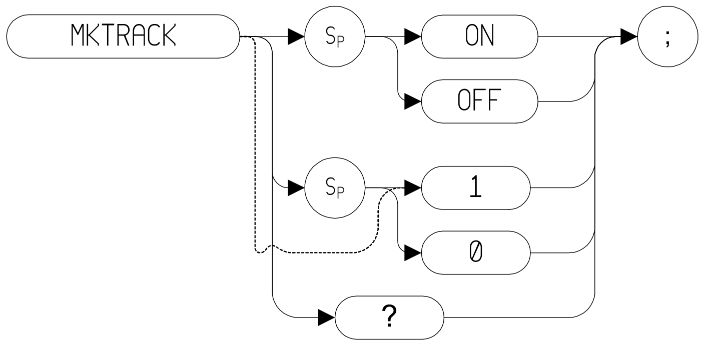
Description

Moves the active marker to the corresponding position in Trace 1, Trace 2, or Trace 3.

NOTE If the marker is moved to an inactive trace, the marker will move to the top of the screen on a PSA analyzer.

MKTRACK
Marker Track

Syntax



Description

Moves the signal on which the active marker is located to the center of the spectrum analyzer display and keeps the signal peak at center screen.

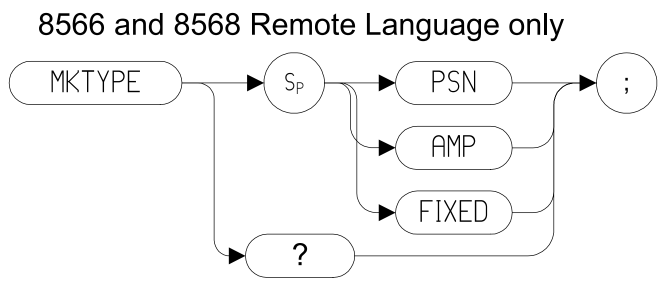
To keep a drifting signal at center screen, place the active marker on the desired signal before turning on MKTRACK.

NOTE The functions of the MKTRACK command are identical to the MT0 *[zero]* command (page 285) and the MT1 *[one]* command (page 286).

Programming Commands

MKTYPE
Marker Type

Syntax



Description

Specifies the type of marker.

MKTYPE PSN allows the marker to be positioned horizontally in display units (default). Use the MKP and MKF commands to position the marker.

MKTYPE AMP allows the marker to be positioned according to amplitude. Use the MKA command to position the marker.

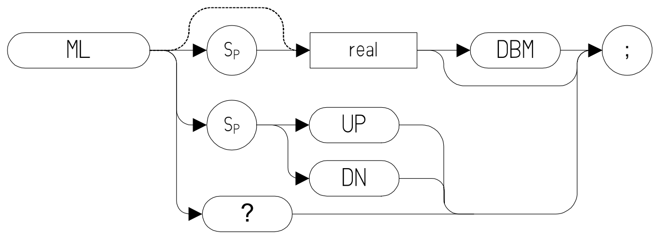
MKTYPE FIXED allows a marker to be placed at any fixed point on the display. Use the MKP, MKF, and MKA commands to position the marker.

NOTE Marker type can only be set for an active marker. The marker type is reset to PSN when the marker is turned off (using the MKOFF command) or the instrument is preset.

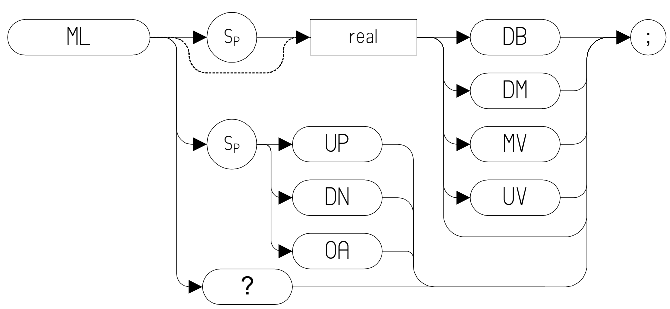
ML
Mixer Level

Syntax

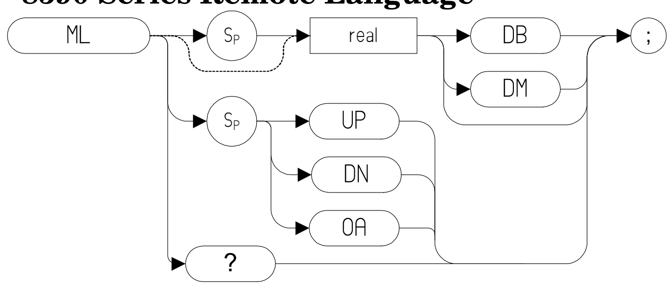
8560 Series Remote Language



8566 and 8568 Remote Language



8590 Series Remote Language



Description

The ML command specifies the maximum signal level that is applied to the input mixer for a signal that is equal to or below the reference level.

The effective mixer level is equal to the reference level minus the input attenuator setting.

NOTE If an external amplifier gain value is set, the mixer level is determined using the following equation:

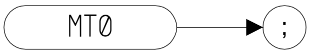
Mixer Level = Ref. Level - Attenuation + Ext. Amplifier Gain

The external amplifier gain is not preset by doing an IP command in case the analyzer is measuring a large signal. This is to protect the analyzer from damage from a large signal. For a helpful suggestion, see Chapter 3 , “Hints and Tips,” on page 81.

NOTE The functions of the ML command are identical to the KS, command (page 186).

MT0 *[zero]* Marker Track Off

Syntax



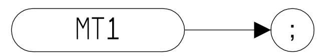
Description

The MT0 *[zero]* command disables the marker tracking mode.

NOTE The functions of the MT0 *[zero]* command are identical to the MKTRACK OFF command (page 281).

MT1 *[one]* Marker Track On

Syntax



Description

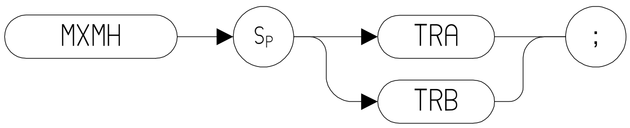
Moves the signal on which the active marker is located to the center of the spectrum analyzer display and keeps the signal peak at center screen.

To keep a drifting signal at center screen, place the active marker on the desired signal before issuing an MT1 *[one]* command.

NOTE The functions of the MT1 command are identical to the MKTRACK ON command (page 281).

MXMH
Maximum Hold

Syntax



NOTE TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

Description

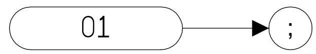
Updates each trace element with the maximum level detected.

MXMH updates the specified trace (either Trace A or Trace B) with a new value from a detector only if the new value is larger than the previous trace data value.

NOTE The functions of the MXMH command are identical to the A2 command (page 90)and B2 command (page 126).

O1 *[one]* Format - Display Units

Syntax

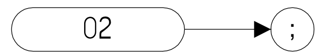


Description

The O1 *[one]* command transmits trace amplitude and position information as decimal values in display units.

O2 *[two]*
Format - Two 8-Bit Bytes

Syntax

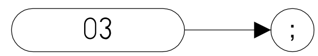


Description

The O2 *[two]* command transmits trace amplitude and position information as two 8-bit binary numbers, or one instruction word.

O3 *[three]*
Format - Real Amplitude Units

Syntax

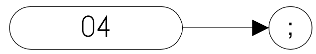


Description

The O3 *[three]* command transmits trace vertical axis information only, in measurement units of Hz, dBm, dB, volts or seconds.

O4 *[four]*
Format - One 8-Bit Byte

Syntax

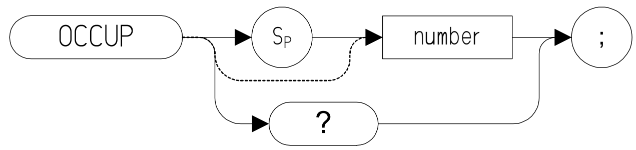


Description

The O4 *[four]* command transmits trace amplitude information only as a binary number.

OCCUP
Percent Occupied Power Bandwidth

Syntax

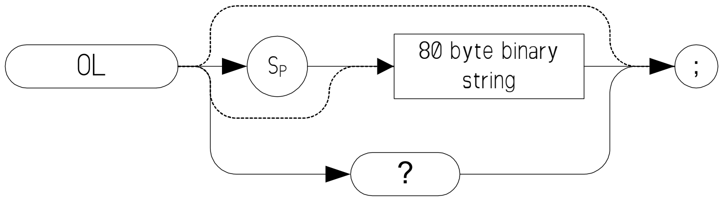


Description

The OCCUP command is used to query the current value of the percent occupied power. This value is set by the DELMKBW (page 155) and the PWRBW command (page 301) command. The OCCUP command can also be used to set the percent occupied power.

OL
Output Learn String

Syntax



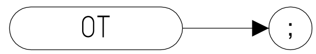
Description

The OL command transmits information to the controller that describes the state of the analyzer when the OL command is executed. This information is called the “learn string.” The learn string can be sent from the controller memory back to the analyzer to restore the analyzer to its original state.

NOTE The OL command is not completely supported, due to differences between the PSA series, ESA series, and 8566/8568.This command is only supported on the PSA series of analyzers with firmware Rev. A.08.02 or later.

OT
Output Trace Annotations

Syntax



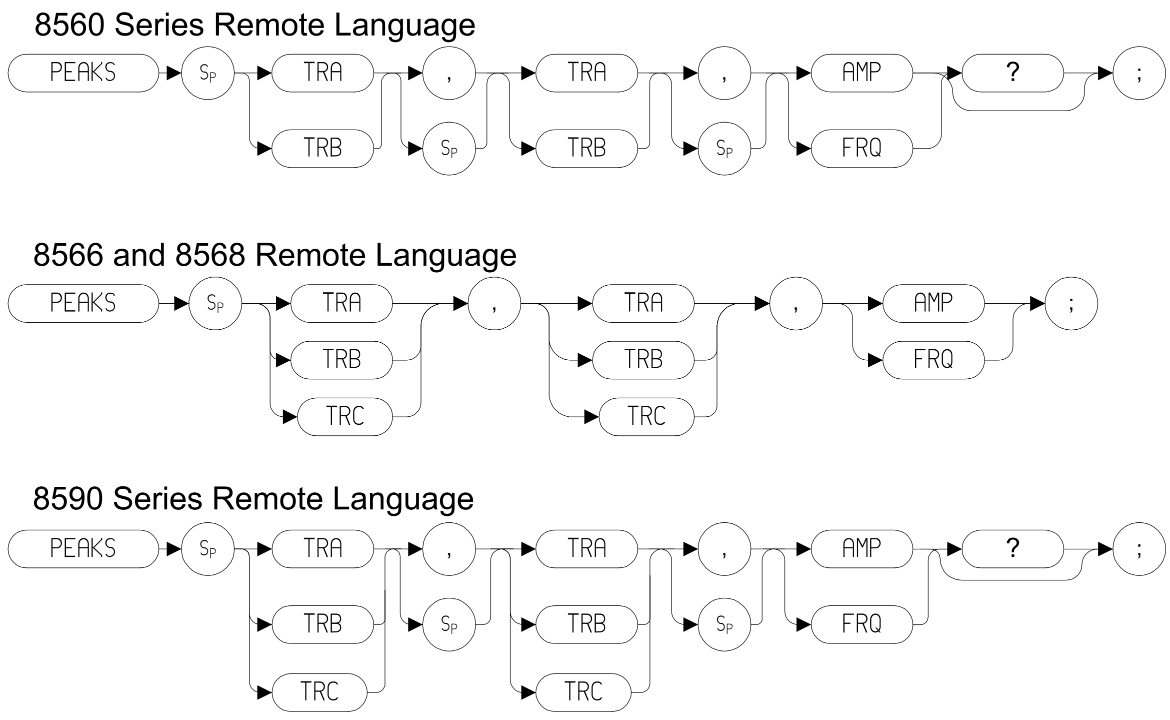
Description

The OT command sends 32 character-strings to the controller. Each character-string can be up to 64 characters long.

NOTE The 'data invalid indicator' status report given in string 27 of the returned text is only supported on PSA.

PEAKS
Peaks

Syntax



Prerequisite Commands: TS when using trace data

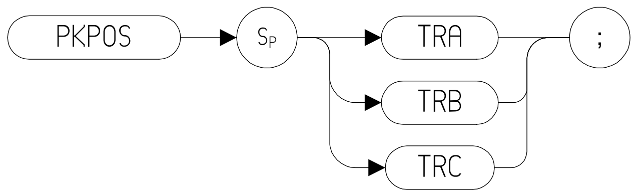
Description

The PEAKS command sorts the signal peaks in the source trace by frequency or amplitude, and sends the sorted results to the destination trace.

Programming Commands

PKPOS
Peak Position

Syntax



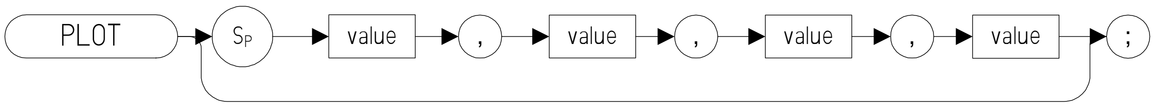
NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Description

The PKPOS command returns the *X* co-ordinate value of the maximum peak in the specified trace.

PLOT
Plot

Syntax



Description

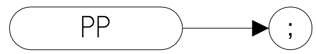
The PLOT command allows you transfer trace data, graticule and annotation information to a printer using a parallel port.

NOTE The legacy analyzers transferred data directly to a plotter via the GPIB connection. The PLOT command now transfers data to a printer, and prints the entire screen. For instructions on connecting your analyzer to a printer, see the *PSA User's and Programmer's Reference*, *Volume 1*.

Although the PLOT command will read in plotter dimension values, these will be ignored.

PP
Preselector Peak

Syntax



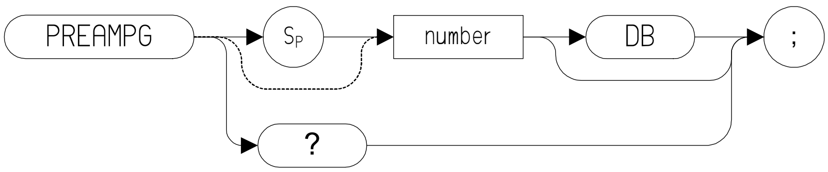
Description

The PP command optimizes preselector tracking to peak the amplitude of a signal at the active marker. If a marker is not on the screen, PP places a marker at the highest signal level, and optimizes preselector tracking at that frequency.

NOTE This command is only supported when the analyzer's maximum frequency limit is greater than 3 GHz. If the command is issued on an analyzer with a maximum frequency limit of 3 GHz or less, an error message will be generated stating that the command is not supported.

PREAMPG
External Preamplifier Gain

Syntax



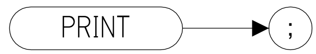
Description

Subtracts a positive or negative preamplifier gain value from the displayed signal. The preamplifier gain is removed by entering a value of 0.

NOTE An Instrument Preset (using the IP command (page 185)) does not reset the preamplifier gain to 0.

PRINT
Print

Syntax



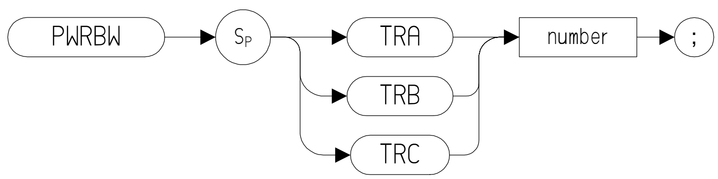
Description

Transfers trace data, graticule and annotation of the analyzer screen directly to a printer via a parallel port.

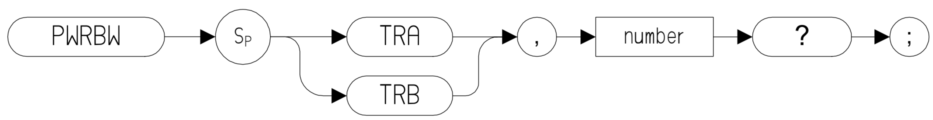
PWRBW
Power Bandwidth

Syntax

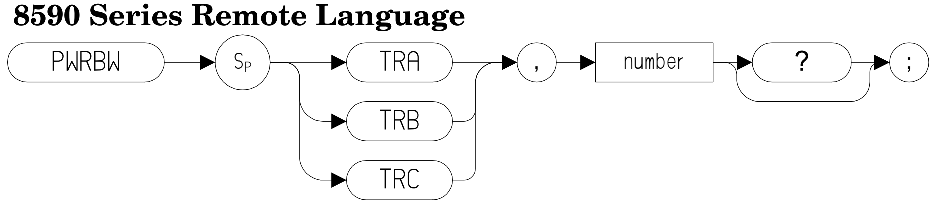
8560 Series Remote Language



8566 and 8568 Remote Language



8590 Series Remote Language



Description

Computes the combined power of all signal responses in the specified trace, and returns the bandwidth of the specified percentage of total power. The number in the command is a percentage value, that is, it has a range of 0 to 100.

NOTE If the percent total power is 100%, the power bandwidth equals the frequency span.

NOTE On the 8566A/B analyzer, this command stops the trace. That is not the case with this Option 266 Programming Code Compatibility.

PWRUPTIME
Power Up Time

Syntax

Description

Returns the number of milliseconds that have elapsed since the spectrum analyzer was turned on.

Q0 *[zero]*
EMI Peak Detection

Syntax

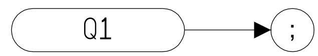
Description

Sets the detector function to EMI detection. This is the same as Peak detection but uses CISPR related bandwidths.

NOTE	DET? will return EPK after execution of the Q0 command.

Q1 *[one]*
Quasi-Peak Detection

Syntax



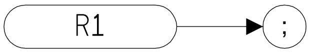
Description

Sets the detector function to Quasi-Peak detection. This is a fast-rise, slow-fall detector used to make CISPR compliant EMI measurements.

NOTE DET? will return QPD after execution of the Q1 command.

R1 *[one]*
Illegal Command SRQ

Syntax

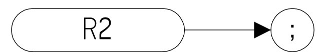


Description

The R1 *[one]* command deactivates all analyzer service requests (SRQs) except SRQ140, the illegal-command service request.

R2 *[two]* End-of-Sweep SRQ

Syntax

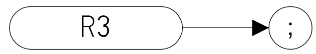


Description

The R2 *[two]* command activates the end-of-sweep and illegal-command service requests.

R3 *[three]*
Hardware Broken SRQ

Syntax

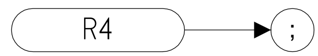


Description

The R3 *[three]* command activates the hardware-broken and illegal-command service requests.

R4 *[four]* Units-Key-Pressed SRQ

Syntax



Description

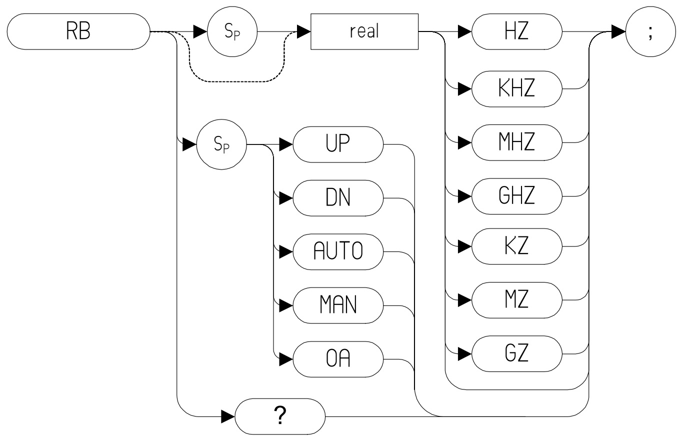
The R4 *[four]* command activate the units-key-pressed and illegal-command SRQs.

NOTE PSA analyzers cannot replicate the units-key-pressed service request since no front panel interaction is supported.

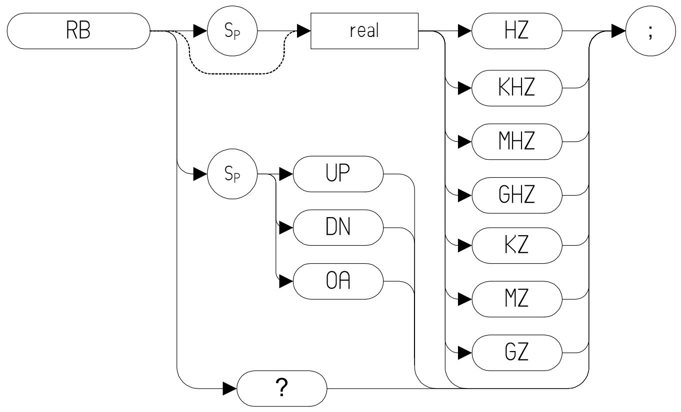
RB
Resolution Bandwidth

Syntax

8560 Series Remote Language



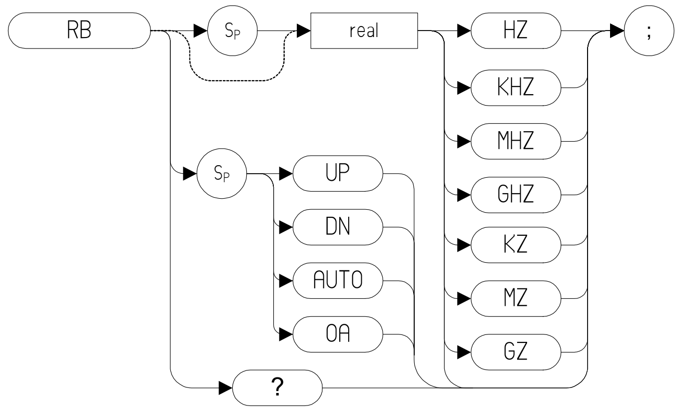
8566 and 8568 Remote Language



Preset State for all languages: 3 MHz, auto coupled.

Step Increment for all languages: In a 1, 3, 10 series.

8590 Series Remote Language



Preset State for all languages: 3 MHz, auto coupled.

Step Increment for all languages: In a 1, 3, 10 series.

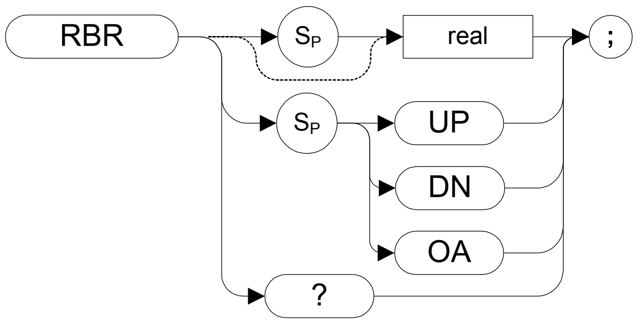
Description

The RB command specifies the resolution bandwidth. Available bandwidths are 10 Hz, 30 Hz, 300 Hz, 1 kHz, 3kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, and 3 MHz. The resolution bandwidths, video bandwidths, and sweep time are normally coupled. Executing RB decouples them. Execute CR (page 150) to reestablish coupling.

NOTE Default values on PSA analyzers may vary from the legacy analyzers. Refer to the PSA *User's and Programmer's Reference, Volume 1* to find out any restrictions that may apply.

RBR
Resolution Bandwidth Ratio

Syntax

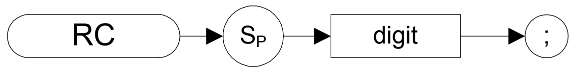


Description

This command is only supported in PSA Series analyzers. It sets the span to resolution bandwidth ratio. Allows you to set the Span/RBW ratio to 1/<value>, where <value> is sent by the user.

RC
Recall State

Syntax



Description

Recalls analyzer state data from the specified state register in the analyzer's memory.

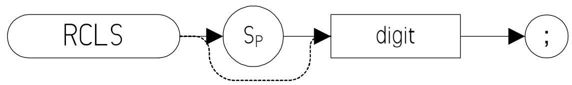
Registers one through six are reserved for the user, and contain instrument states (such as front panel configuration) saved with the SAVES command (page 323) or the SV command (page 343).

NOTE Recalling the Preset state (RC 7) is only supported in Option 266 Programming Code Compatibility Suite if **Save Reg 7 (Preset only)** is switched **On** in the Preferences menu (see page 1-39). Only the Preset state can be recalled. The previous state can not be recalled. With the **Save Reg 7 (Preset only)** turned **Off**, the measurement performance of the analyzer will be faster than when it is turned **On**.

NOTE The functions of the RC command are identical to the RCLS command (page 313).

RCLS
Recall State

Syntax



Description

Recalls analyzer state data from the specified state register in the analyzer’s memory.

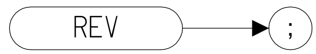
Registers one through six are reserved for the user, and contain instrument states (such as front panel configuration) saved with the SAVES command (page 323) or the SV command (page 343).

NOTE The functions of the RCLS command are identical to the RC command (page 312).

NOTE Recalling the Preset state (RCLS 7) is only supported in Option 266 Programming Code Compatibility Suite if **Save Reg 7 (Preset only)** is switched **On** in the Preferences menu (see page 1-39). Only the Preset state can be recalled. The previous state can not be recalled.

REV
Revision

Syntax



Description

The REV command returns the firmware revision number.

NOTE In PSA analyzers, this command returns the build date of Option 266 that you have installed in your analyzer. The date is returned in YYWW format where YY is the number of years since 1950, and WW is week number within that year (often referred to as “Work Week”).

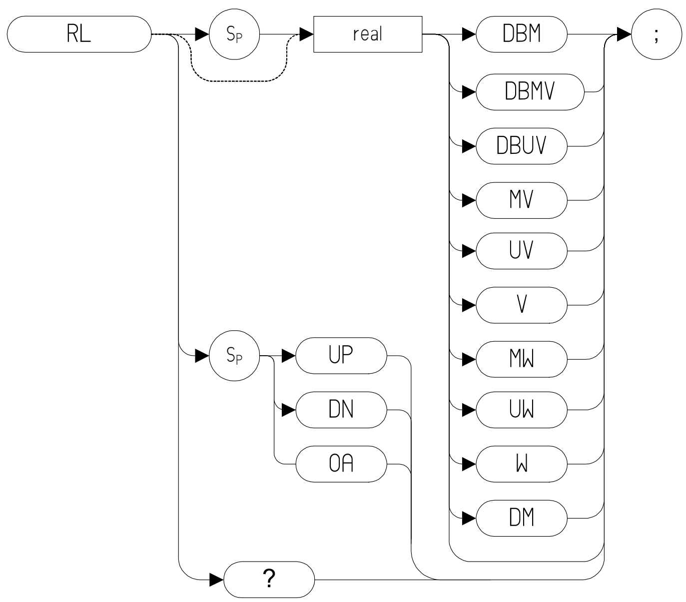
As an example, if your Option 266 Programming Code Compatibility firmware was built on May 23 2004, the number 5421 would be returned. The year 2004 is 54 years after 1950, and May 23 is the 21st week of the year, hence 5421.

Programming Commands

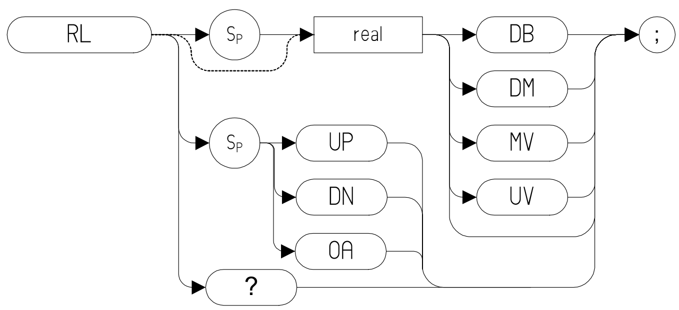
RL
Reference Level

Syntax

8560 Series Remote Language



8566, 8568, and 8590 Series Remote Language



Description

Specifies the amplitude level of the top graticule line on the display. This represents the reference level.

CAUTION	Signal levels above +30 dBm will damage the spectrum analyzer. For a helpful suggestion on this subject, see Chapter 3 , “Hints and Tips,” on page 81.

NOTE The 8590 Series of analyzers have a maximum value of 60 dBm for the reference level. The range of reference levels for the PSA Series of analyzers depends on the other settings shown below:

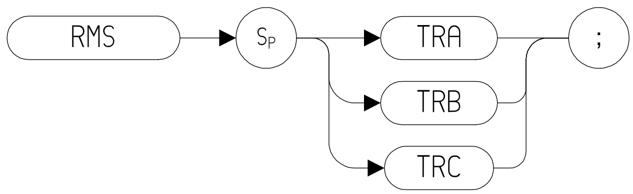
- –170 dBm to +30 dBm with 0 dB reference level offset.
- –160 dBm to +40 dBm with 10 dB reference level offset.
- –180 dBm to +20 dBm with 10 dB external amplifier gain.
- –170 dBm to 0 dBm with preamp on (Option 1DS).

NOTE If the display line is on, changing the reference level does not adjust the position of the display line.

RMS
Root Mean Square Value

Returns the root mean square value of the trace in measurement units.

Syntax



Prerequisite Commands: TS when using trace data.

NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

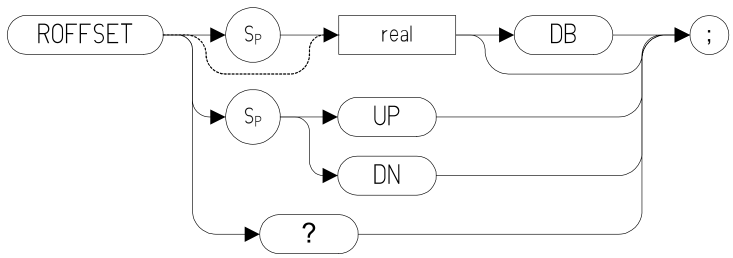
Description

Returns the RMS value of the trace in display units.

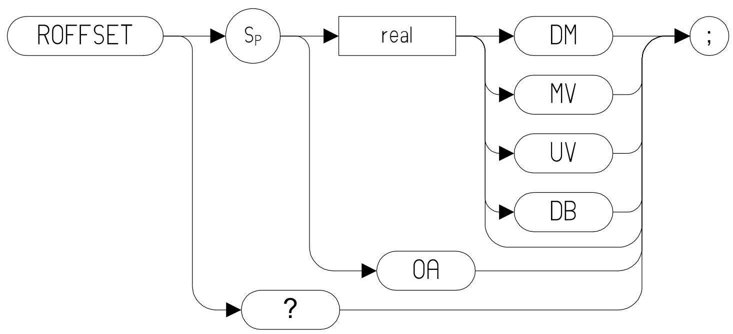
ROFFSET
Reference Level Offset

Syntax

8560 Series and 8590 Series Remote Language



8566 Remote Language



Description

Offsets all amplitude readouts without affecting the trace.

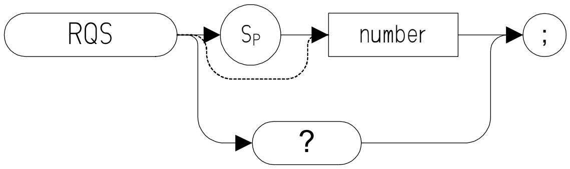
Once activated, the ROFFSET command displays the amplitude offset on the left side of the screen.

Entering ROFFSET 0 or presetting the spectrum analyzer eliminates an amplitude offset.

NOTE The functions of the ROFFSET command are identical to the KSZ command (page 221).

RQS
Service Request Mask

Syntax



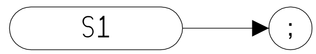
Description

Sets a bit mask for service requests.

NOTE Some differences may be noticed in the value returned by the RQS query when compared with the value set. This is because Option 266 on PSA analyzers does not support the use of bit-1 of the status byte. Bit-1 of the status byte is always set to Off.

S1*[one]*
Continuous Sweep

Syntax



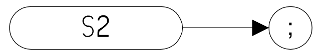
Description

The S1 command sets the spectrum analyzer to continuous sweep mode. In the continuous sweep mode, the spectrum analyzer takes its next sweep as soon as possible after the current sweep (as long as the trigger conditions are met). A sweep may temporarily be interrupted by data entries made over the remote interface.

NOTE The functions of the command S1 are identical to the CONTS command (page 147).

S2 *[two]*
Single Sweep

Syntax



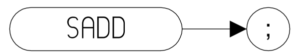
Description

The S2 command sets the analyzer to single sweep mode. Each subsequent time that the command S2 is sent, one sweep is started if the trigger conditions are met.

NOTE The functions of the S2 command are similar to the SNGLS command (page 332).

SADD
Add Limit Line Segment

Syntax

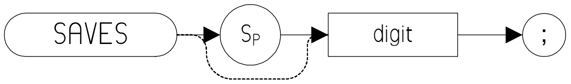


Description

The SADD command is used to add a limit-line segment to the current limit line.

SAVES
Save State

Syntax



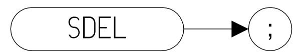
Description

Saves the current state of the spectrum analyzer in any of the registers one through six.

NOTE The functions of the SAVES command are identical to the SV command (page 343).

SDEL
Delete Limit Line Segment

Syntax

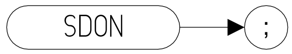


Description

The SDEL command deletes the limit-line segment specified with the SEDI command (page 326).

SDON
Terminate Limit Line Segment

Syntax

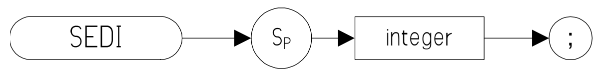


Description

The SDON command is used to terminate the SEDI command (page 326).

SEDI
Activate Limit Line Segment

Syntax



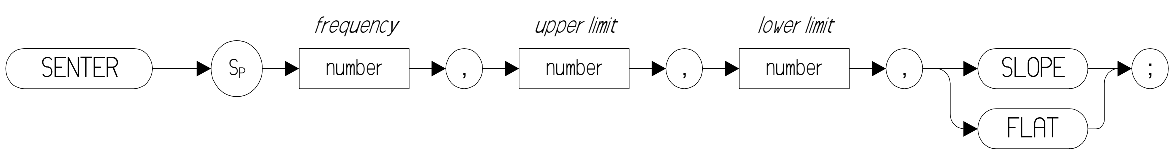
Description

The SEDI command activates the limit-line segment you identify by its segment number in the limit-line table.

NOTE The maximum number of limit line points that can be specified on a PSA Series analyzer is 200.

SENTER
Segment Entry for Frequency Limit Lines

Syntax



Description

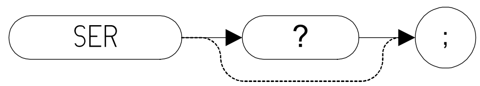
The SENTER command is used to create a complete limit-line segment.

NOTE Although the parameters SLOPE and FLAT are accepted in the command, they are ignored and have no effect.

Programming Commands

SER
Serial Number

Syntax



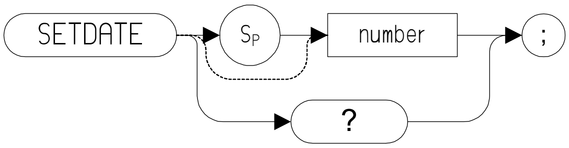
Description

The SER command returns the analyzer serial number to the controller.

Programming Commands

SETDATE
Set Date

Syntax

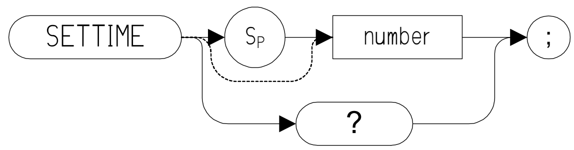


Description

The SETDATE command sets the date of the real-time clock of the spectrum analyzer. The date takes the form YYMMDD (Year, Month, Day)

SETTIME
Set Time

Syntax

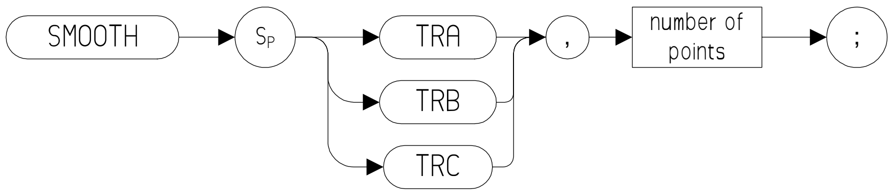


Description

The SETTIME command sets the date of the real-time clock of the spectrum analyzer. The time takes the form HHMMSS (Hour, Minute, Second)

SMOOTH
Smooth Trace

Syntax



Prerequisite Commands: TS when using trace data.

NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Description

Smooths the trace according to the number of points specified for the running average.

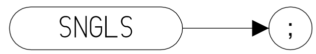
Each point value is replaced with the average of the values (in measurement units) of the given number of points centered on it. Increasing the number of points increases smoothing at the cost of decreasing resolution. If the number of points is an even number, then the number of points is increased by one.

Smoothing decreases at the endpoints.

NOTE Some differences may be noticed between the smoothed trace in the legacy analyzers and the smoothed trace using the same signal in PSA analyzers.

SNGLS
Single Sweep

Syntax



Description

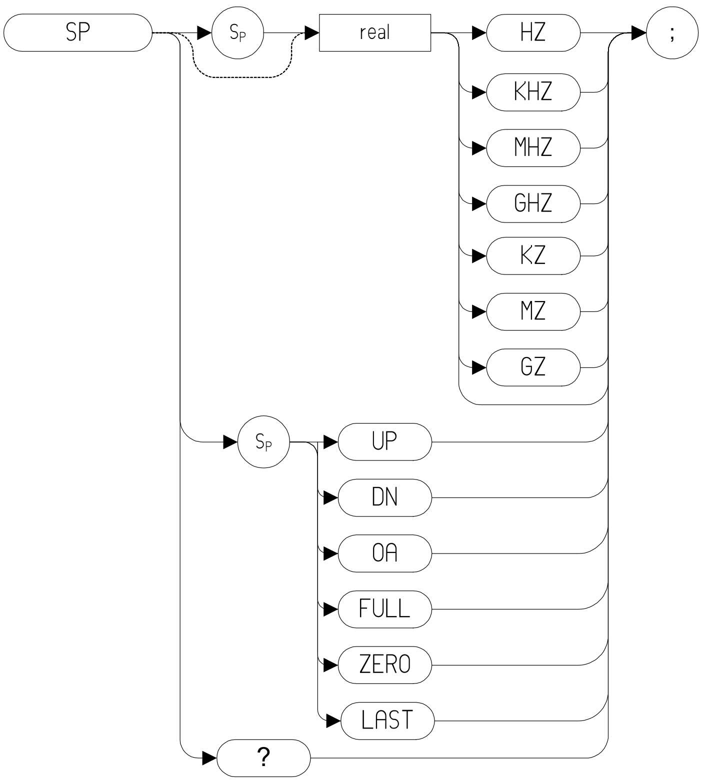
Sets the spectrum analyzer to single-sweep mode. Each time TS (take sweep) is sent, one sweep taken as long as the trigger conditions are met.

NOTE The functions of the SNGLS command are identical to the S2 command (page 321).

SP
Frequency Span

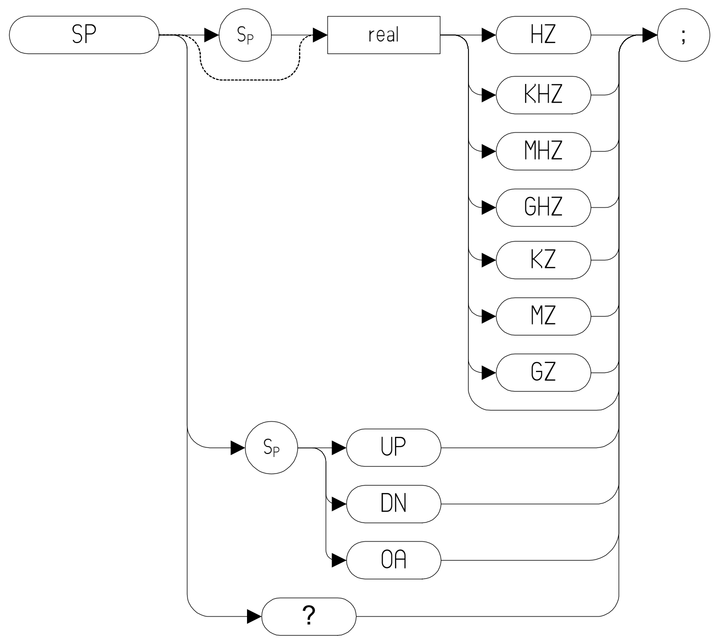
Syntax

8560 Series Remote Language



Step Increment: 1, 2, 5, 10 sequence (up to the stop frequency of the spectrum analyzer)

8566, 8568, and 8590 Series Remote Language



Step Increment: 1, 2, 5, 10 sequence (up to the stop frequency of the spectrum analyzer)

Description

Changes the total displayed frequency range symmetrically about the center frequency.

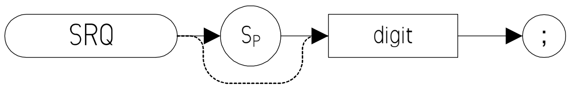
If resolution and video bandwidths are coupled to the span width, the bandwidths change with the span width to provide a predetermined level of resolution and noise averaging. Likewise, the sweep time changes to maintain a calibrated display, if coupled. All of these functions are normally coupled, unless RB (page 309), VB (page 365), or ST (page 338) have been executed.

NOTE Option 266 Programming Code Compatibility does not mimic the exact coupling behavior of the legacy analyzers. Refer to your PSA *User's and Programmer's Reference, Volume 1* for the values used.

Programming Commands

SRQ
User-Defined SRQ

Syntax



Description

The SRQ command sends a service request to the controller when the SRQ operand fits the mask supplied with the RQS command.

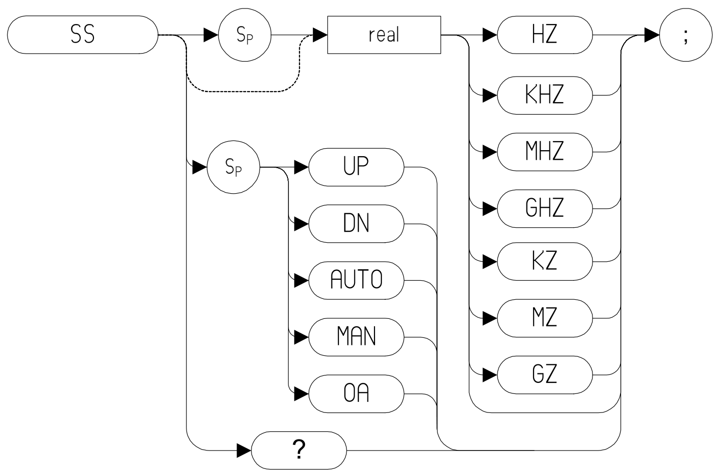
NOTE Option 266 Programming Code Compatibility does not support the setting of bit 1 (units-key-pressed) of the status byte. Bit-1 of the status byte is always set to Off

Programming Commands

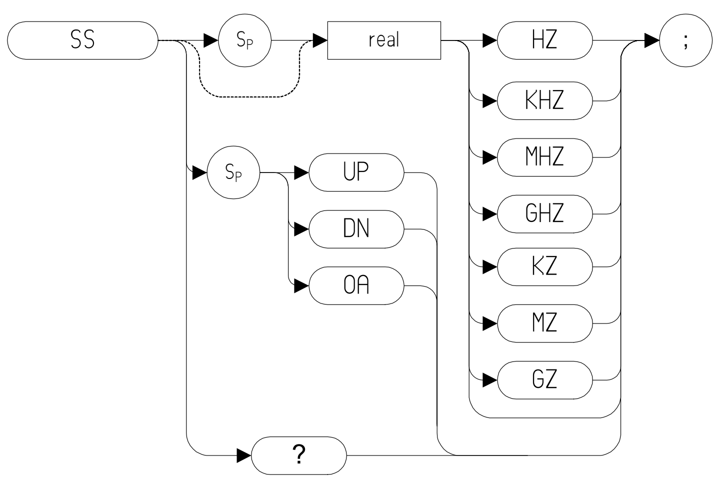
SS
Center Frequency Step Size

Syntax

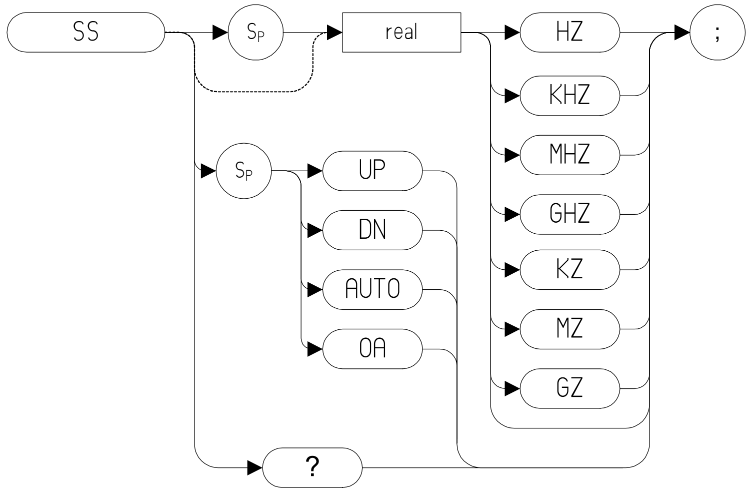
8560 Series Remote Language



8566 and 8568 Remote Language



8590 Series Remote Language



Description

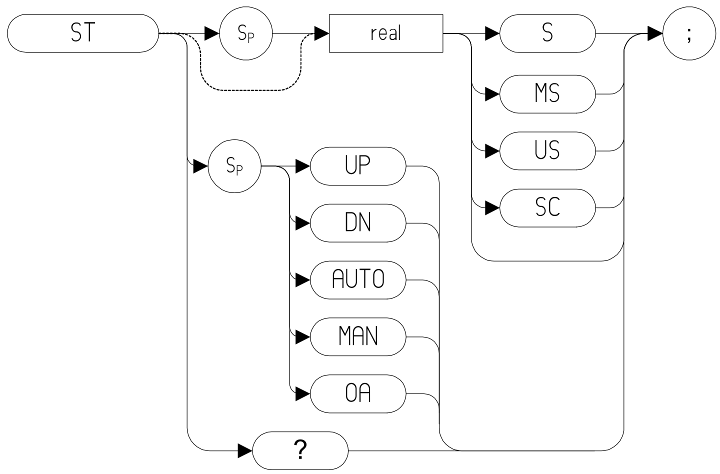
The SS command specifies center frequency step size.

Programming Commands

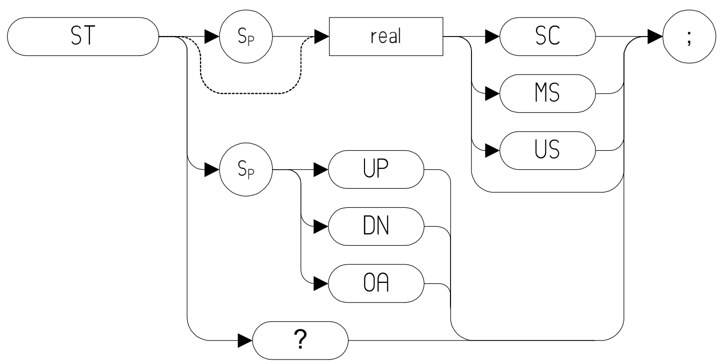
ST
Sweep Time

Syntax

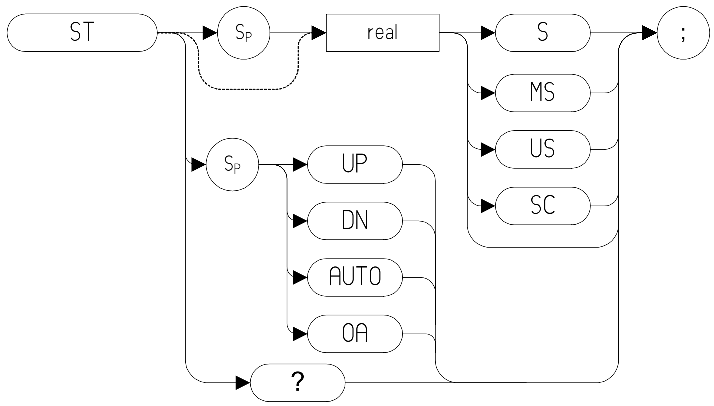
8560 Series Remote Language



8566 and 8568 Remote Language



8590 Series Remote Language



Description

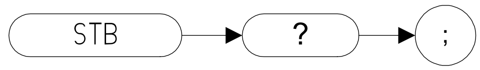
The ST command specifies the time in which the analyzer sweeps the displayed frequency or time span.

NOTE The OA option in the ST command behaves in the same manner as the ST? command in that it returns the current value to the controller. However, the OA option does not set the active function to Sweep Time.

Programming Commands

STB
Status Byte Query

Syntax

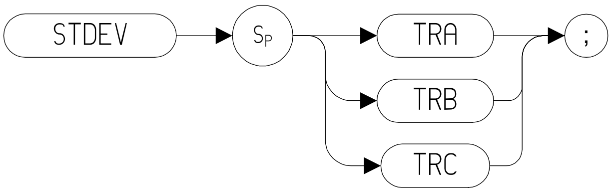


Description

The STB command returns to the controller the decimal equivalent of the bits set in the status byte (see the RQS (page 319) and SRQ (page 335) commands). STB is equivalent to a serial poll. The RQS and associated bits are cleared in the same way that a serial poll would clear them.

STDEV
Standard Deviation of Trace Amplitudes

Syntax



Prerequisite Commands: TS when using trace data

NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

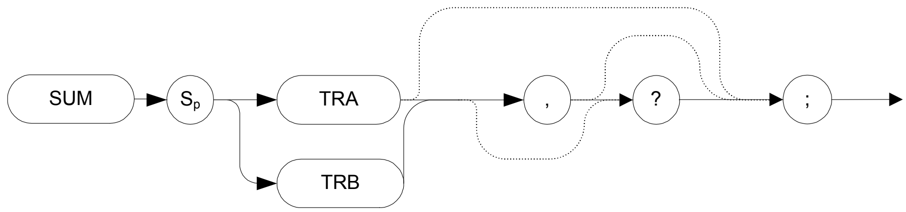
Description

Returns the standard deviation of the trace amplitude in display units.

Programming Commands

SUM

Syntax



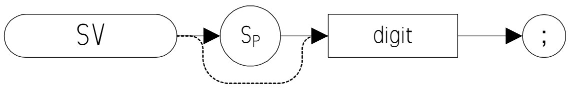
Description

Returns the sum of all the trace values to the controller.

NOTE The 856x series of analyzers returns display units, range (0-610)*601 points or if Trace Data Format (TDF) is set to M, it returns ASCII.

SV
Save State

Syntax



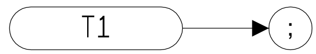
Description

Saves the current state of the spectrum analyzer in any of the registers one through six.

NOTE The functions of the SV command are identical to the SAVES command (page 323).

T1 *[one]*
Free Run Trigger

Syntax



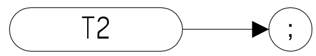
Description

The T1 *[one]* command sets the analyzer sweep to free run trigger mode.

NOTE The functions of the T1 *[one]* command are identical to the TM FREE command (page 354).

T2 *[two]*
Line Trigger

Syntax



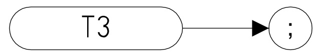
Description

The T2 *[two]* command sets the analyzer sweep to line trigger mode.

NOTE The functions of the T2 *[two]* command are identical to the TM LINE command (page 354).

T3 *[three]*
External Trigger

Syntax



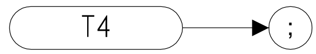
Description

The T3 *[three]* command sets the analyzer sweep to external trigger mode.

NOTE The functions of the T3 *[three]* command are identical to the TM EXT command (page 354).

T4 *[four]*
Video Trigger

Syntax



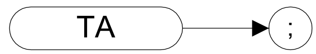
Description

The T4 *[four]* command sets the analyzer sweep to video trigger mode.

NOTE The functions of the T4 *[four]* command are identical to the TM VID command (page 354).

TA
Trace A

Syntax



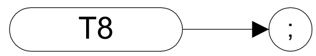
Description

Returns trace A amplitude values from the analyzer to the controller.

The display unit values are transferred in sequential order (from left to right) as seen on the screen. Display unit values can be transferred to the controller in any one of the four output formats as determined by the O1 *[one]* (page 288), O2 *[two]* (page 289), O3 *[three]* (page 290) and O4 *[four]* commands (page 291). The format of the returned data is also affected by the TDF (Trace Data Format) (page 350) command and, if TDF B (binary data format) has been selected, by the MDS command (page 248).

TB
Trace B

Syntax



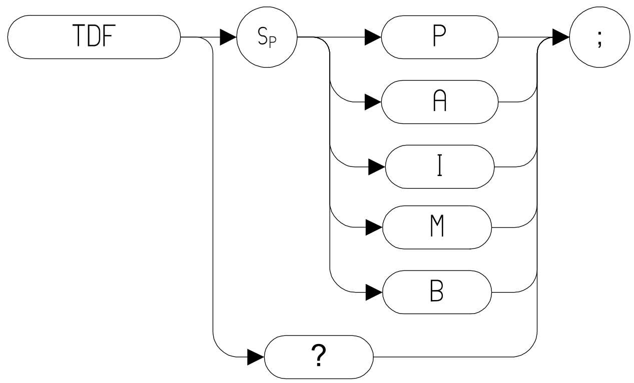
Description

Returns trace B amplitude values from the analyzer to the controller.

The display unit values are transferred in sequential order (from left to right) as seen on the screen. Display unit values can be transferred to the controller in any one of the four output formats as determined by the O1 *[one]* (page 288), O2 *[two]* (page 289), O3 *[three]* (page 290) and O4 *[four]* commands (page 291). The format of the returned data is also affected by the TDF (Trace Data Format) (page 350) command and, if TDF B (binary data format) has been selected, by the MDS command (page 248).

TDF
Trace Data Format

Syntax



Description

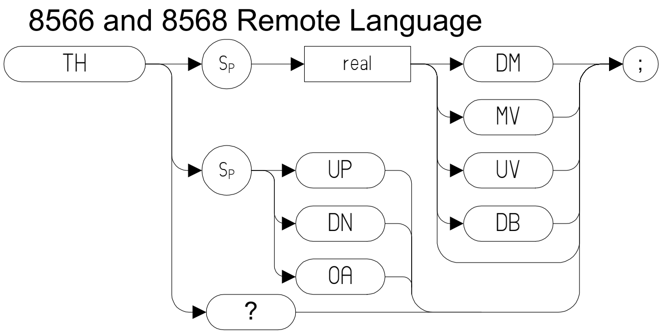
Formats trace information for return to the controller.

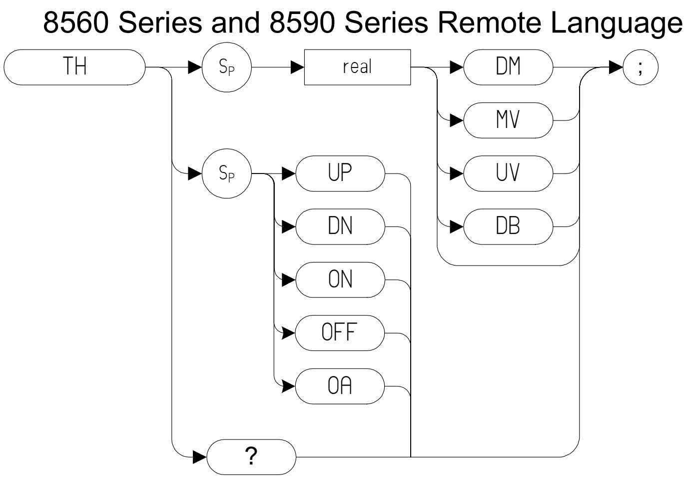
The different trace data formats are as follows:

- Specifying M enables the 01 format and returns values in display units, from 0 to 1001.
- Specifying P enables the 03 format and returns absolute measurement values, such as dBm or Hz.
- Specifying A returns data as an A-block data field. The MDS command determines whether data comprises one or two 8-bit bytes. (See MDS (page 248))
- Specifying I returns data as an I-block data field. The MDS command determines whether data comprises one or two 8-bit bytes. (See MDS (page 248))
- Specifying B enables the 02 or 04 format. The MDS command determines whether data comprises one or two 8-bit bytes

TH
Threshold

Syntax





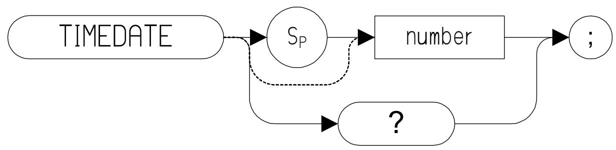
Description

The TH command blanks signal responses below the threshold level, similar to a base line clipper. The threshold level is nine major divisions below the reference level, unless otherwise specified. The UP and DN commands move the threshold 10 dB.

NOTE The legacy analyzers all blank the display of everything below the threshold level, but this is not the case with PSA analyzers. Using the PEAKS (page 295) and MKPK (page 270) commands causes any values below the threshold level to be disregarded, even though the full trace will still be displayed. The 8560 Series supported the MKPT command in addition to the TH command. In PSA analyzers, both the TH and the MKPT commands will set the Marker Peak Threshold level; so if both commands are used in a single program, incompatibility issues may be experienced.

TIMEDATE
Time Date

Syntax

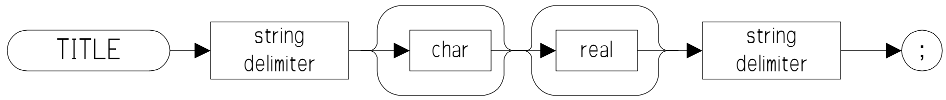


Description

Sets the date and time of the real-time clock of the spectrum analyzer. The number takes the form YYMMDDHHMMSS (Year, Month, Day, Hour, Minute, Second).

TITLE
Title

Syntax



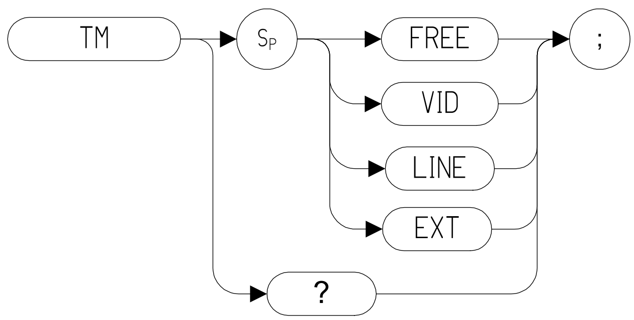
Description

The TITLE command activates the screen title mode, enabling you to enter your own title for the screen. Valid string delimiters which must be used to start and terminate the title are shown below.

- !
- “
- $
- %
- &
- ‘
- /
- :
- =
- \
- ~
- @

TM
Trigger Mode

Syntax



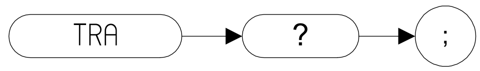
Description

Selects a trigger mode: free, line, video, or external.

NOTE The functions of the TM command are identical to the T1 (page 344), T2 (page 345), T3 (page 346) and T4 (page 347) commands.

TRA
Trace Data Input and Output

Syntax

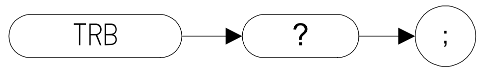


Description

The TRA command transfers Trace A amplitude values from the analyzer to the controller. The format depends on the trace data format selected. See the TDF command (page 350) for details on formatting.

TRB
Trace Data Input and Output

Syntax

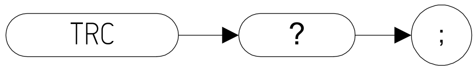


Description

The TRB command transfers Trace B amplitude values from the analyzer to the controller. The format depends on the trace data format selected. See the TDF command (page 350) for details on formatting.

TRC
Trace Data Input and Output

Syntax

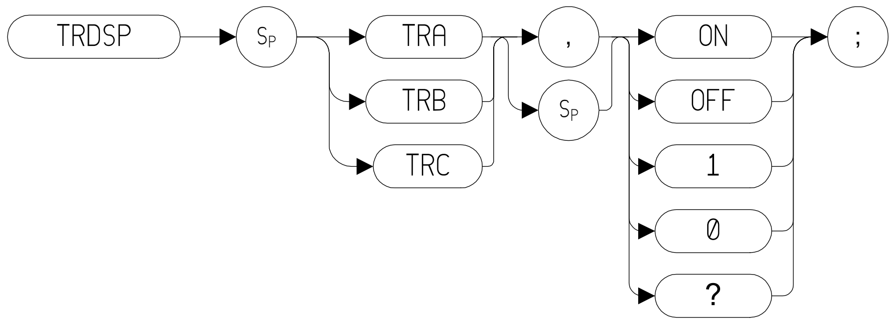


Description

The TRC command transfers Trace Amplitude values from the analyzer to the controller. The format depends on the trace data format selected. See the TDF command (page 350) for details on formatting.

TRDSP
Trace Display

Syntax

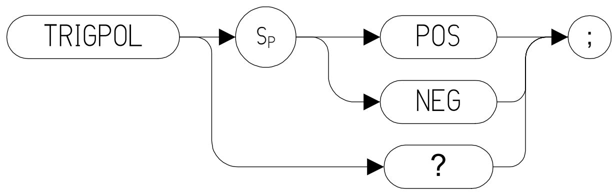


Description

The TRDSP command turns the display of the specified trace on or off.

TRIGPOL
Trigger Polarity

Syntax

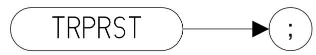


Description

Selects the edge (positive or negative) of the trigger input that causes the trigger event. TRIGPOL is available in all trigger modes.

TRPRST
Trace Preset

Syntax



Description

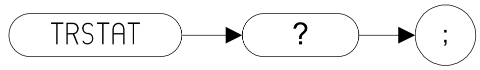
Sets the trace operations to their preset values.

NOTE Option 266 Language Code Compatibility does not do the following stages of TRPRST as they are not supported:

- ANLGPLUS OFF
- DISPOSE ONEOS
- DISPOSE ONSWP
- DISPOSE TRMATH
- EM

TRSTAT
Trace State

Syntax



Description

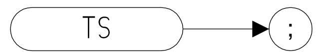
The TRSTAT command returns trace states to the controller. Valid trace states are Clear-write, Off, View, Maximum Hold, and Blank.

Table 4-18 Possible Trace States

Trace State Description	Trace State Data Returned
Clear-write	CLRW
View	VIEW
Blank	BLANK
Off	No data is returned
Maximum Hold	MXMH

TS
Take Sweep

Syntax



Description

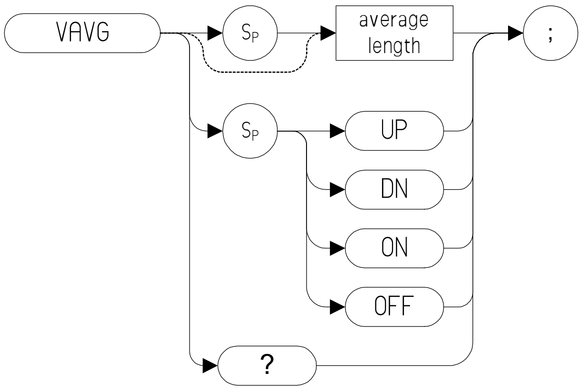
Starts and completes one full sweep before the next command is executed.

A take sweep is required for each sweep in the single-sweep mode. TS prevents further input from the interface bus until the sweep is completed to allow synchronization with other instruments.

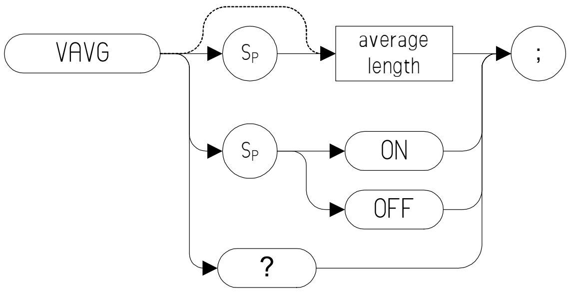
VAVG
Video Average

Syntax

8560 Series Remote Language



8566 and 8568 Remote Language



Description

Enables the video-averaging function, which averages trace points to smooth the displayed trace. When queried, the VAVG command returns the average length.

NOTE The functions of the VAVG command are identical to the KSG command (page 198) and KSH command (page 200).

NOTE There are a few differences in the way video averaging works in Option 266 Programming Code Compatibility Suite compared to the legacy spectrum analyzers. See the following table for a summary of these differences.

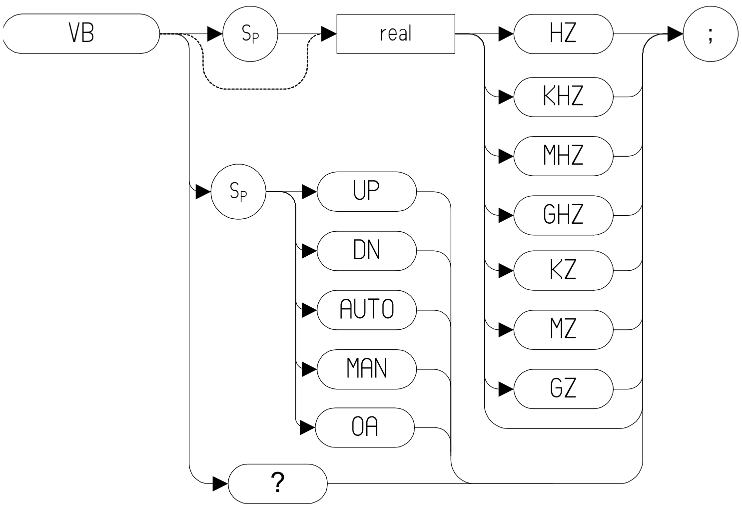
Table 4-19 Legacy Analyzers - Video Averaging Behavioral Differences

Condition	Legacy Spectrum Analyzers	Option 266 - Programming Code Compatibility Suite
All conditions.	*8566 and 8568 only* - Original trace is displayed in Trace C.	Only displays the averaged trace. The averaged trace is displayed in Trace A.
Average Count value set to 0.	Cannot be set to 0.	Video averaging is turned off if the Averaging Count is set to 0.
Change in Average Count setting to a higher value.	*8566 and 8568 only* - Continues counting from where the previous value left off.	Resets the counter to zero and starts the measurement again.
Change in average counter setting to a lower value.	*8566 and 8568 only* - Updates the screen annotation with the lower averaging value.	If the new count value has not been reached, continues until the new lower count has been reached. If the new, lower count value has already been reached, the analyzer will stop and wait until you take a new sweep.
Averaging turned on.	Sweep time remains unchanged.	Sweep time changes due to the selection of the sample detector.
Change in resolution bandwidth, video bandwidth, sweep time, reference level or attenuation.	*8566 and 8568 only* - In single sweep mode, resets counter to zero and starts the averaging again.	Continues the measurement without resetting the counter.
Change in center frequency or span.	In single sweep mode, resets counter to zero and starts the averaging again. *8566 and 8568 only* - Also reset the counter after changes in RBW, VBW, Sweep Time, Ref. Level and Attenuation.	In single sweep mode, resets counter to zero and starts the averaging again. Does not reset the counter after changes in RBW, VBW, Sweep Time, Ref. Level and Attenuation.

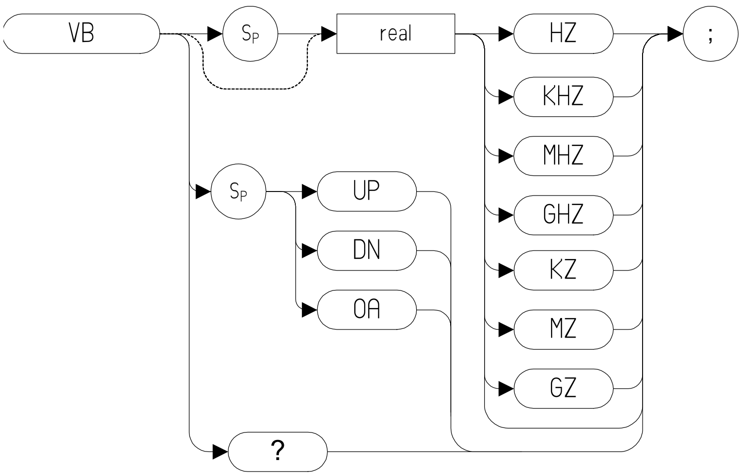
VB
Video Bandwidth

Syntax

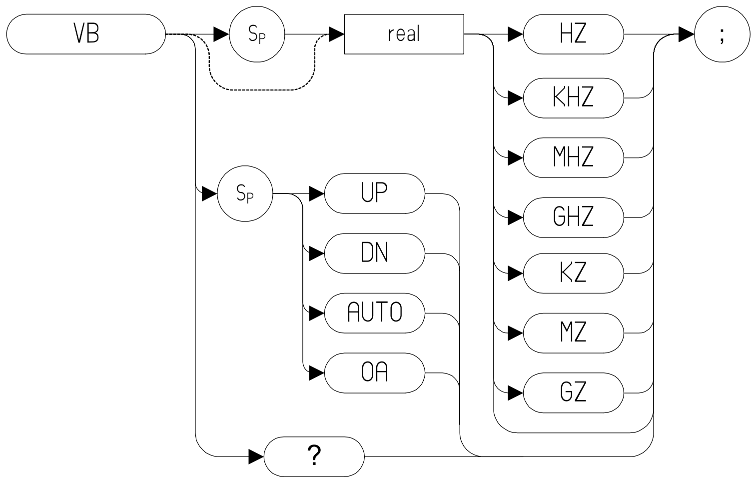
8560 Series Remote Language



8566 and 8568 Remote Language



8590 Series Remote Language



Description

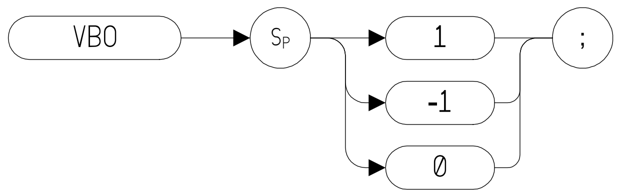
Specifies the video bandwidth, which is a post-detection, low-pass filter.

NOTE Default values on the PSA analyzers may differ from the legacy analyzers. Refer to the PSA *User's and Programmer's Reference, Volume 1* for more details on the restrictions on the video bandwidth range.

When auto coupled, the video bandwidth is calculated as Resolution Bandwidth x Video Resolution Bandwidth Ratio. See the VBO command (page 367) for more details.

VBO
Video Bandwidth Coupling Offset

Syntax



Description

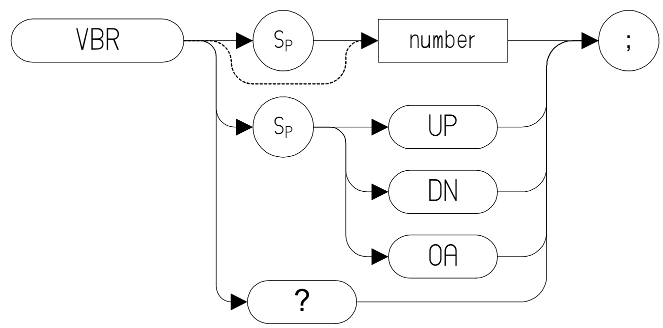
The VBO command specifies the relationship between the video and resolution bandwidths which is maintained when these bandwidths are coupled. The bandwidths are usually coupled unless the RB command (page 309) or VB command (page 365) have been executed.

- When 0 is selected, the ratio remains fixed at 1. That is, the resolution bandwidth and the video bandwidth are always equal
- When 1 is selected, the video bandwidth is one step higher than the resolution bandwidth. That is, the video bandwidth:resolution bandwidth ratio is three.
- When -1 is selected, the video bandwidth is one step lower than the resolution bandwidth. That is, the video bandwidth:resolution bandwidth ratio is 0.3.

Programming Commands

VBR
Video Bandwidth to Resolution Bandwidth Ratio

Syntax



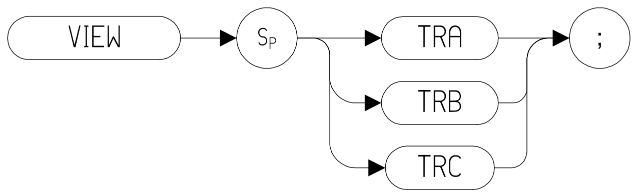
Description

The VBR command specifies the relationship between the video and resolution bandwidths that is maintained when these bandwidths are coupled.

NOTE Some differences may be seen between the resolution bandwidth and video bandwidth settings when auto coupled on a PSA Series analyzer.

VIEW
View Trace

Syntax



Description

Displays Trace A, trace B, or trace C, and stops taking new data into the viewed trace.

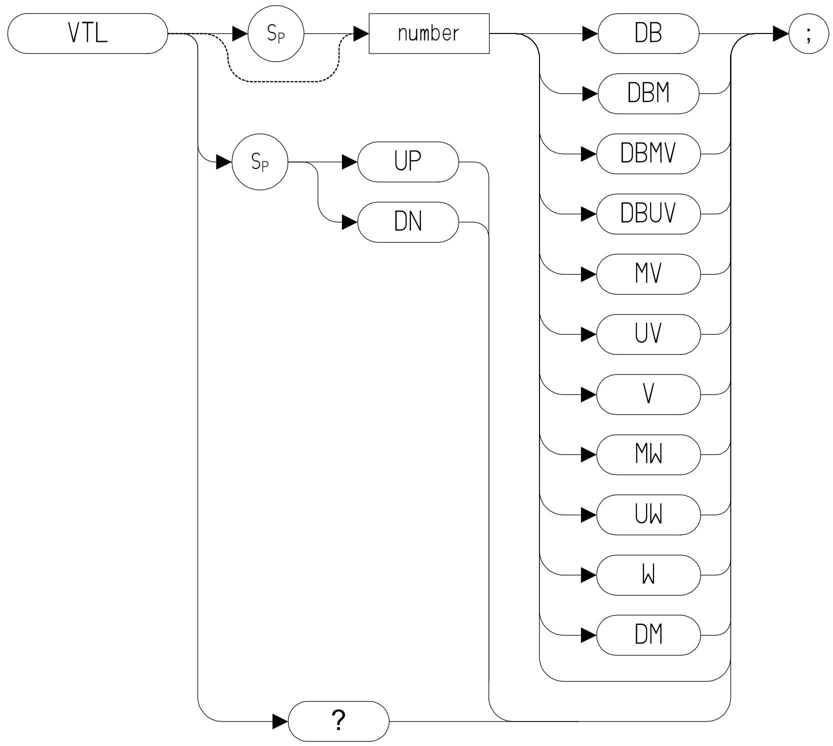
NOTE The functions of the VIEW command are identical to the A3 (page 91), B3 (page 127) and KSj (page 204) commands.

NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Programming Commands

VTL
Video Trigger Level

Syntax



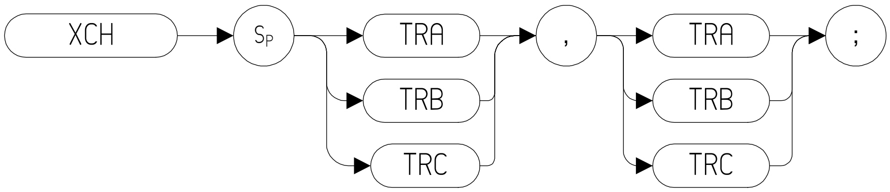
Description

The VTL command sets the signal level that triggers a sweep.

Programming Commands

XCH
Exchange

Syntax



Description

The XCH command exchanges the contents of the source and destination traces. The traces are analyzed and adjusted to fit the number of display points on the screen.

NOTE The functions of the XCH TRA,TRB command are identical to the AXB (page 124) and EX (page 171) commands.

The functions of the XCH TRB,TRC command are identical to the BXC (page 133) and KSi (page 203) commands.

5 A Brief Introduction to the SCPI Language

SCPI Language Basics

This section is not intended to teach you everything about the SCPI (Standard Commands for Programmable Instruments) programming language. The SCPI Consortium or IEEE can provide that level of detailed information.

Topics covered in this chapter include:

- "Creating Valid Commands" on page 374
- "Command Keywords and Syntax" on page 374
- "Special Characters in Commands" on page 375
- "Parameters in Commands" on page 377
- "Putting Multiple Commands on the Same Line" on page 379

For more information refer to:

IEEE Standard 488.1-1987, *IEEE Standard Digital Interface for Programmable Instrumentation.* New York, NY, 1998.

IEEE Standard 488.2-1987, *IEEE Standard Codes, Formats, Protocols and Comment Commands for Use with ANSI/IEEE Std488.1-1987*. New York, NY, 1998.

Command Keywords and Syntax

A typical command is made up of keywords set off by colons. The keywords are followed by parameters that can be followed by optional units.

Example: `SENSe:FREQuency:STARt 1.5 MHZ`

The instrument does not distinguish between upper and lower case letters. In the documentation, upper case letters indicate the short form of the keyword. The lower case letters, indicate the long form of the keyword. Either form may be used in the command.

Example: Sens:Freq:Star 1.5 mhz

is the same as `SENSE:FREQ:`start 1.5 MHz

NOTE The command `SENS:FREQU:STAR` is not valid because `FREQU` is neither the short, nor the long form of the command. Only the short and long forms of the keywords are allowed in valid commands.

Creating Valid Commands

Commands are not case sensitive and there are often many different ways of writing a particular command. These are examples of valid commands for a given command syntax:

<table>
<tr><th>Command Syntax</th><th>Sample Valid Commands</th></tr>
<tr><td>[SENSe:]BANDwidth[:RESolution] <freq></td><td>The following sample commands are all identical. They will all cause the same result.
• Sense:Band:Res 1700
• BANDWIDTH:RESOLUTION 1.7e3
• sens:band 1.7KHZ
• SENS:band 1.7E3Hz
• band 1.7kHz
• bandwidth:RES 1.7e3Hz</td></tr>
<tr><td>MEASure:SPECtrum[n]?</td><td>• MEAS:SPEC?
• Meas:spec?
• meas:spec3?
The number 3 in the last meas example causes it to return different results then the commands above it. See the command description for more information.</td></tr>
<tr><td>[:SENSe]:DETector[:FUNCtion] NEGative|POSitive|SAMPle</td><td>• DET:FUNC neg
• Detector:Func Pos</td></tr>
<tr><td>INITiate:CONTinuous ON|OFF|1|0</td><td>The sample commands below are identical.
• INIT:CONT ON
• init:continuous 1</td></tr>
</table>

Special Characters in Commands

<table>
<tr><th>Special Character</th><th>Meaning</th><th>Example</th></tr>
<tr><td>|</td><td>A vertical stroke between parameters indicates alternative choices. The effect of the command is different depending on which parameter is selected.</td><td>Command:
TRIGger:SOURce EXTernal|INTernal|LINE
The choices are external, internal, and line.
Ex: TRIG:SOURCE INT
is one possible command choice.</td></tr>
</table>

<table>
<tr><th>Special Character</th><th>Meaning</th><th>Example</th></tr>
<tr><td></td><td>A vertical stroke between keywords indicates identical effects exist for both keywords. The command functions the same for either keyword. Only one of these keywords is used at a time.</td><td>Command:
SENSe:BANDwidth|BWIDth:OFFSet
Two identical commands are:
Ex1: SENSE:BWIDTH:OFFSET
Ex2: SENSE:BAND:OFFSET</td></tr>
<tr><td>[ ]</td><td>keywords in square brackets are optional when composing the command. These implied keywords will be executed even if they are omitted.</td><td>Command:
[SENSe:]BANDwidth[:RESolution]:AUTO
The following commands are all valid and have identical effects:
Ex1: bandwidth:auto
Ex2: band:resolution:auto
Ex3: sense:bandwidth:auto</td></tr>
<tr><td>< ></td><td>Angle brackets around a word, or words, indicates they are not to be used literally in the command. They represent the needed item.</td><td>Command:
SENS:FREQ <freq>
In this command example the word <freq> should be replaced by an actual frequency.
Ex: SENS:FREQ 9.7MHz.</td></tr>
<tr><td>{ }</td><td>Parameters in braces can optionally be used in the command either not at all, once, or several times.</td><td>Command:
MEASure:BW <freq>{,level}
A valid command is:
meas:BW 6 MHz, 3dB, 60dB</td></tr>
</table>

Parameters in Commands

There are four basic types of parameters: booleans, keywords, variables and arbitrary block program data.

OFF|ON|0|1
(Boolean) This is a two state boolean-type parameter. The numeric value 0 is equivalent to OFF. Any numeric value other than 0 is equivalent to ON. The numeric values of 0 or 1 are commonly used in the command instead of OFF or ON. Queries of the parameter always return a numeric value of 0 or 1.

keyword The keywords that are allowed for a particular command are defined in the command syntax description.

Units Numeric variables may include units. The valid units for a command depend on the variable type being used. See the following variable descriptions. The indicated default units will be used if no units are sent. Units can follow the numerical value with, or without, a space.

Variable A variable can be entered in exponential format as well as standard numeric format. The appropriate range of the variable and its optional units are defined in the command description.

The following keywords may also be used in commands, but not all commands allow keyword variables.

- DEFault - resets the parameter to its default value.
- UP - increments the parameter.
- DOWN - decrements the parameter.
- MINimum - sets the parameter to the smallest possible value.
- MAXimum - sets the parameter to the largest possible value.

The numeric value for the function's MINimum, MAXimum, or DEFault can be queried by adding the keyword to the command in its query form. The keyword must be entered following the question mark.

Example query: `SENSE:FREQ:CENTER? MAX`

Variable Parameters

<integer> is an integer value with no units.

<real> Is a floating point number with no units.

<freq>

<bandwidth> Is a positive rational number followed by optional units. The default unit is Hertz. Acceptable units include: Hz, kHz, MHz, GHz.

<time>
<seconds> Is a rational number followed by optional units. The default units are seconds. Acceptable units include: ks, s, ms, us, ns.

<voltage> Is a rational number followed by optional units. The default units are Volts. Acceptable units include: V, mV, uV, nV

<current> Is a rational number followed by optional units. The default units are Amperes. Acceptable units include: A, mA, uA, nA.

<power> Is a rational number followed by optional units. The default units are W. Acceptable units include: mAW, kW, W, mW, uW, nW, pW.

<ampl> Is a rational number followed by optional units. The default units are dBm. Acceptable units include: dBm, dBmV, dBuV.

<rel_power>
<rel_ampl> Is a positive rational number followed by optional units. The default units are dB. Acceptable units include: dB.

<percent> Is a rational number between 0 and 100. You can either use no units or use PCT.

<angle>
<degrees> Is a rational number followed by optional units. The default units are degrees. Acceptable units include: DEG, RAD.

<string> Is a series of alpha numeric characters.

<bit_pattern> Specifies a series of bits rather than a numeric value. The bit series is the binary representation of a numeric value. There are no units.

Bit patterns are most often specified as hexadecimal numbers, though octal, binary or decimal numbers may also be used. In the SCPI language these numbers are specified as:

- Hexadecimal, #Hdddd or #hdddd where ‘d’ represents a hexadecimal digit 0 to 9 and ‘a’ to ‘f’. So #h14 can be used instead of the decimal number 20.
- Octal, #Odddddd or #odddddd where ‘d’ represents an octal digit 0 to 7. So #o24 can be used instead of the decimal number 20.
- Binary, #Bdddddddddddddddd or #bdddddddddddddddd where ‘d’ represents a 1 or 0.

So #b10100 can be used instead of the decimal number 20.

Block Program Data

Some parameters consist of a block of data. There are a few standard types of block data. Arbitrary blocks of program data can also be used.

<trace> Is an array of rational numbers corresponding to displayed trace data. See FORMat:DATA for information about available data formats.

A SCPI command often refers to a block of current trace data with a variable name such as: Trace1, TRACE2, or trace3, depending on which trace is being accessed.

<arbitrary block data> Consists of a block of data bytes. The first information sent in the block is an ASCII header beginning with #. The block is terminated with a semi-colon. The header can be used to determine how many bytes are in the data block. There are no units. (You will not get block data if your data type is ASCII, using `FORMat:DATA ASCII` command. Your data will be comma separated ASCII values.

Block data example: suppose the header is #512320.

- The first digit in the header (5) tells you how many additional digits/bytes there are in the header.
- The 12320 means 12 thousand, 3 hundred, 20 data bytes follow the header.
- Divide this number of bytes by your current data format (bytes/data point), either 8 (for real,64), or 4 (for real,32). For this example, if you're using real64 then there are 1540 points in the block.

Putting Multiple Commands on the Same Line

Multiple commands can be written on the same line, reducing your code space requirement. To do this:

- Commands must be separated with a semicolon (;).
- If the commands are in different subsystems, the key word for the new subsystem must be preceded by a colon (:).
- If the commands are in the same subsystem, the full hierarchy of the command key words need not be included. The second command can start at the same key word level as the command that was just executed.

SCPI Termination and Separator Syntax

All binary trace and response data is terminated with <NL><END>, as defined in Section 8.5 of IEEE Standard 488.2-1992, *IEEE Standard Codes, Formats, Protocols and Common Commands for Use with ANSI/IEEE Std 488.1-1987*. New York, NY, 1992. (Although one intent of SCPI is to be interface independent, <END> is only defined for IEEE 488 operation.)

The following are some examples of good and bad commands. The examples are created from a theoretical instrument with the simple set of commands indicated below:

```
[:SENSe]
     :POWer
          [:RF]
          :ATTenuation 40dB

:TRIGger
     [:SEQuence]
     :EXTernal [1]
          :SLOPe
               POSitive

[:SENSe]
     :FREQuency
          :STARt
     :POWer
     [:RF]
          :MIXer
               :RANGe
              [:UPPer]
```

Bad Command	Good Command
`PWR:ATT 40dB`	`POW:ATT 40dB`
The short form of **POWER** is **POW**, not **PWR**.	
`FREQ:STAR 30MHz;MIX:RANG -20dBm`	`FREQ:STAR 30MHz;POW:MIX:RANG -20dBm`
The **MIX:RANG** command is in the same **:SENSE** subsystem as **FREQ**, but executing the **FREQ** command puts you back at the **SENSE** level. You must specify **POW** to get to the **MIX:RANG** command.	
`FREQ:STAR 30MHz;POW:MIX RANG -20dBm`	`FREQ:STAR 30MHz;POW:MIX:RANG -20dBm`
MIX and **RANG** require a colon to separate them.	
`:POW:ATT 40dB;TRIG:FREQ:STAR 2.3GHz`	`:POW:ATT 40dB;:FREQ:STAR 2.3GHz`
:FREQ:STAR is in the **:SENSE** subsystem, not the **:TRIGGER** subsystem.	
`:POW:ATT?:FREQ:STAR?`	`:POW:ATT?;:FREQ:STAR?`

Bad Command	Good Command
:POW and **FREQ** are within the same **:SENSE** subsystem, but they are two separate commands, so they should be separated with a semicolon, not a colon.	
`:POW:ATT -5dB;:FREQ:STAR 10MHz`	`:POW:ATT 5dB;:FREQ:STAR 10MHz`
Attenuation cannot be a negative value.	

Index

Index

Index

Index

Index