Agilent X-Series Signal Analyzer

This manual provides documentation for the following X-Series Analyzers:

PXA Signal Analyzer N9030A
MXA Signal Analyzer N9020A
EXA Signal Analyzer N9010A

N9061A
Remote Language
Compatibility Guide

Agilent Technologies

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Manual Part Number

Print Date

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Where to Find the Latest Information

Documentation is updated periodically. For the latest information about this analyzer, including firmware upgrades, application information, and product information, see the following URLs:

http://www.agilent.com/find/pxa
http://www.agilent.com/find/mxa
http://www.agilent.com/find/exa

To receive the latest updates by email, subscribe to Agilent Email Updates:

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

Information on preventing analyzer damage can be found at:

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

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1 Getting Started

N9061A Application Description

The N9061A application is the remote language compatibility suite for the Agilent Technologies X-Series of signal analyzers. It allows the analyzers 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

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

The X-Series analyzer with the N9061A application installed is designed to replace these analyzers in many automated systems with minimal or no modification to the currently used measurement software.

There are two options for N9061A. One is N9061A-1FP, 8566A/B and 8568A/B remote language compatibility, the other is N9061A-2FP, 8560 Series remote language compatibility.

Documentation for the N9061A application

Signal Analyzers with N9061A

When you purchase your X-Series signal analyzer with the Remote Language Compatibility Suite (N9061A), this manual - the *Remote Language Compatibility Guide* (N9020-90119) is included on the documentation CD and is installed on the analyzer in the online help.

For information on PXA series analyzers and other related documentation, refer to the PXA web site at http://www.agilent.com/find/pxa.

For information on MXA series analyzers and other related documentation, refer to the MXA web site at http://www.agilent.com/find/mxa/.

For information on EXA series analyzers and other related documentation, refer to the EXA web site at http://www.agilent.com/find/exa/.

This *Remote Language Compatibility 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 X-Series analyzer. For a fuller description of these commands, refer to the manuals supplied with your original analyzer.

Signal Analyzer Updates

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

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

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

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

N9061A General Rules and Limitations

The N9061A application 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.

Remote Control

The N9061A application in X-Series signal analyzers supports remote operation through the GPIB interface. It does not support working over LAN, USB or Telnet.

Units

The N9061A application supports all units used in legacy products. The allowed units are HZ, KHZ, MHZ, GHZ, KZ, MZ, GZ, DBM, DBMV, DBUV, MV, UV, V, MW, UW, W, DB, DM, MS, US, SC, and S (case insensitive in 8566/68). A command terminator such as ";" also acts as a unit terminator.

Numeric Ranges

Numeric ranges are limited to that of the X-Series unless otherwise stated, although commands such as FS or IP that go to a default range will use the range of the legacy instrumentation.

Returning Data

The X-Series and legacy instruments have a different approach when returning data to the controller. The X-Series and 8560-series analyzers operate a FIFO buffer for command return values. If a command returns a value that the controller does not read, the returned data is stored until such a time that the controller requires the value. The 8566, 8568, and 8590-series legacy analyzers only store one value at a time. Any value stored is overwritten each time a command returns a value. The N9071A application handles this difference appropriately only within a single command string.

In the case of query string, it returns the query result for the last command in the string. For example, if "CF?MA?FA?" is sent, the result of FA? will be returned. However, this rule does not work if the query is located at both sides of the "TS" command. When the command string "MA;TS;CF?" is sent, the result of CF? will be returned in the next query.

AC/DC Coupling

The 44 GHz and 50 GHz X-Series analyzers only have DC coupling. The X-Series analyzers with a 26.5 GHz frequency range and lower, default to AC coupling on preset. The N9061A application will ensure that DC coupling is the default when the selected instrument is HP8566A, HP8566B, HP8563, HP8564, or HP8565.

When AC coupled, the 8560E/61E/62E have a 100 kHz low frequency limit, while the X-Series analyzers has a 10 MHz limit.

For HP8568A/B compatibility and consistency, the I1 and I2 commands have been supported. These select AC or DC coupling at the RF input. Note tht the HP8568A/B has two RF input ports in comparison with the X-Series, which only has one.

Markers

The N9071A application emulates the behavior of legacy products. If someone uses a marker state which is not available in the legacy instrument, further marker behavior is undefined until instrument preset.

On systems that supported MKACT, there are 4 completely different marker pairs, each with its own information. The N9061A will store the currently active value of MKACT. If MKACT is 2 then it will use Markers 3 and 4 instead of 1 and 2.

Parsing

For 8566B and 8568B, the N9061A will remember the active function and supports UP, DN, and OA, all of which change the active function. It also supports '?', which does not change the active function.

One difference between N9061A and 8566/68 is that the 8566/68 parses a command for example CF 10.3GZ, immediately when it recognizes a complete command, in this example after the GZ. However the N9061A parses at the end of a line when it sees the line termination sequence.

Couplings

To provide the most optimized use of the X-Series analyzers, the N9061A application uses the auto coupling features of the X-Series analyzers and does not attempt to mimic the exact behavior of coupling in the legacy analyzers. To eliminate the possibilities of "Meas Uncal" errors between auto and manual values, values will default to the X-Series auto settings where applicable (for example resolution bandwidth). There are several exceptions below.

To prevent timeout errors in the legacy code, the resolution bandwidth minimum matches the minimum in the legacy analyzer. Resolution bandwidth steps and resolution, however, will be X-Series values.

The video bandwidth will couple to the resolution bandwidth according to the Video bandwidth coupling offset value, specified by the VBO or VBR command. The X-Series analyzers sets the video bandwidth according to the VBO or VBR setting, but uses the X-Series analyzers available bandwidths to prevent 'Meas Uncal' errors.

Predefined Functions

In the 8566/8568/8560 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.

The N9061A application 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 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 the N9061A application. In addition, the behavior of certain commands that rely on the "active functions" (UP, DN, etc.) may be slightly different.

Supported Commands

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

EP is the enable parameter in the 8560 series that, when used as a secondary keyword after a command, transfers control and allows front panel operator entry. This command is supported in the N9061A application for the same active functions as the 8560 series, but is not displayed in any of the format diagrams for individual commands.

The N9061A application supports the OA parameter that is found in several legacy commands such as AT and CF. OA is the equivalent of a query so that "CF OA" has a return value equivalent to "CF?".

Device clear is supported by the N9061A application and causes a mode preset of the signal analyzer.

Unsupported Commands and Queries

If a command is valid for legacy products but not supported by the N9061A application, there will be no error message generated, although the Command Log file will note a "Command Not Supported" comment. Note that this logging behavior can be controlled via the preferences menu.

If a query is valid for legacy products but not supported by the N9061A application, it will return a "0" over the GPIB bus to prevent a program from hanging.

Hardware and Firmware Requirements for N9061A

One of the following Agilent signal analyzers is required to run the N9061A application.

Table 1-1   Compatible Agilent PXA Series Signal Analyzers

Analyzer Model Number	Upper Frequency Limit	Firmware
N9030A-503	3.6 GHz	Rev A.04.00 or later
N9030A-508	8.4 GHz	Rev A.04.00 or later
N9030A-513	13.6 GHz	Rev A.04.00 or later
N9030A-526	26.5 GHz	Rev A.04.00 or later

Table 1-2   Compatible Agilent MXA Series Signal Analyzers

Analyzer Model Number	Upper Frequency Limit	Firmware
N9020A-503	3.6 GHz	Rev A.01.64 or later
N9020A-508	8.4 GHz	Rev A.01.64 or later
N9020A-513	13.6 GHz	Rev A.01.64 or later
N9020A-526	26.5 GHz	Rev A.01.64 or later

Table 1-3   Compatible Agilent EXA Series Signal Analyzers

Analyzer Model Number	Upper Frequency Limit	Firmware
N9010A-503	3.6 GHz	Rev A.01.64 or later
N9010A-507	7 GHz	Rev A.01.64 or later
N9010A-513	13.6 GHz	Rev A.01.64 or later
N9010A-526	26.5 GHz	Rev A.01.64 or later

For maximum compatibility, you should select an X-Series analyzer that equals or exceeds the frequency range of the legacy analyzer you are replacing (currently not possible for the 8564E/EC or 8565E/EC). The frequency limits of the legacy instruments are listed below.

Table 1-4   Frequency Ranges of the Legacy Analyzers

Remote Language	Start Frequency	Stop Frequency
8560E/EC	30 Hz	2.9 GHz
8561E/EC	30 Hz	6.5 GHz

Table 1-4   **Frequency Ranges of the Legacy Analyzers**

Remote Language	Start Frequency	Stop Frequency
8562E/EC	30 Hz	13.2 GHz
8563E/EC	9 kHz	26.5 GHz
8564E/EC	9 kHz	40.0 GHz
8565E/EC	9 kHz	50.0 GHz
HP8566A	2 GHz	22 GHz
HP8566B	2 GHz	22 GHz
HP8568A	0 Hz	1.5 GHz
HP8568B	0 Hz	1.5 GHz

Installing the N9061A application

Remote language compatibility for the 8566/8568/8560 Series of analyzers is a licensed application on the X-Series analyzers. The option for 8560 series is N9061A-2FP and the option for 8566/8568 is N9061A-1FP. The application must be installed and licensed on the X-Series analyzer (PXA, MXA, EXA but not CXA) for it to work correctly.

Installation

The license is installed on the X-Series analyzer in one of the following ways:

- If you purchased a new X-Series analyzer with the N9061A application then the product is installed and licensed and ready to use.

- If you have an X-Series analyzer and have subsequently purchased the N9061A application then you can download the N9061A application from the Agilent website. The N9061A application is installed as part of a software upgrade. See the link below for Signal Analyzers software upgrade site. After upgrading your software you should then use your entitlement certificate to license the product (see Licensing below).

The latest revision of the software may be downloaded from:

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

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

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

NOTE   No calibration is required after the N9061A application is installed.

Licensing

When you order a licensed product, you receive an entitlement certificate. Instructions are provided on your entitlement certificate to direct you to the Web site to redeem your certificate for a license key. You need to provide your instrument product number and serial number, and the entitlement certificate number.

Required Information:	Front Panel Key Path:
Model #: (Ex. N9020A)	
Instrument Serial Number: _____	**System** > **Show > System**

The license is downloaded from the license website onto a USB storage device so that it can be loaded into the instrument.

A license key is usually for one instrument model/serial number combination. The license key can only be installed on that instrument.

License Installation Procedure over USB

1. Redeem the Option Upgrade Entitlement Certificate by following the instructions on the Certificate.
2. After redeeming your Option Upgrade Entitlement Certificate you will receive an e-mail with an attached License File.
3. Locate a USB storage device and save the .lic file to the root directory of the USB storage device.
4. Connect the USB storage device to one of the signal analyzer USB ports. Windows detects the new hardware and may display the configuration menu. This menu may be configured according to your preferences.
5. The signal analyzer automatically consumes the license file. (This may take a few minutes) When the license is consumed the Agilent License Manager displays a "Successful License Installation" message.
6. Alternatively the license file can be manually installed over USB or LAN by placing the license file in the following folder on the signal analyzer.
   C:\Program Files\Agilent\licensing

Verify the Installation

1. Press **System** > **Show** > **System** to display the list of installed applications.

2. Verify that the new application appears in the list.

   If you require further assistance, please contact the Agilent support team.

   Online assistance: http://www.agilent.com/find/assist

   If you do not have access to the Internet, contact your local Agilent Technologies Sales and Service Office, or if in the United States, call 1-800-829-4444.

Setting up N9061A on the X-Series Analyzer

Figure 1-1 is an example mode menu map showing the N9061A (Remote Language Compatibility) application selection on your signal analyzer. To select the N9061A application, press the **Mode** hardkey on the X-Series analyzer front panel and then select the **Remote Language Compatibility** mode. If there are more than six modes on the signal analyzer, then use the More button to find the Remote Language Compatibility selection.

Figure 1-1   **Example Mode Menu Map for X-Series Analyzers**
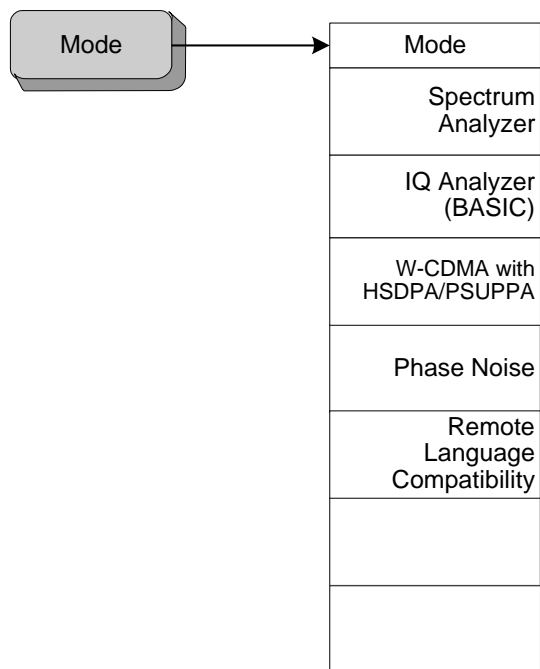
Then, to select the legacy analyzer you wish to emulate, press the **Mode Setup** hardkey on the front panel. Figure 1-2 shows the menu map that allows you to select the 8560 series analyzer or 8566A/B, 8568A/B and therefore the remote control commands to be used in the X-Series analyzer.

Figure 1-2   **Mode Setup > Legacy Instrument Selection Menu Map**
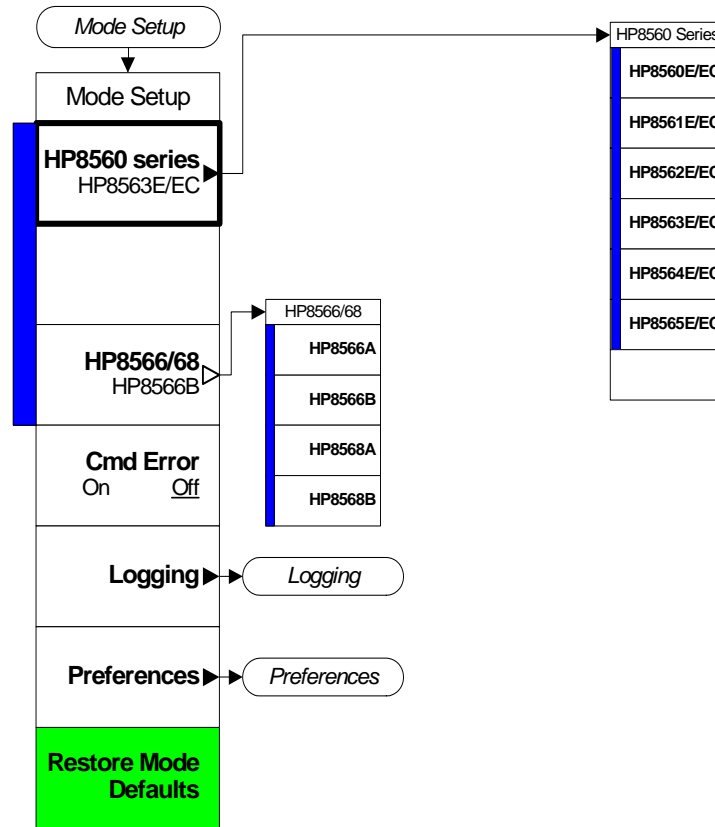
The HP8560 series and HP8566A/B, 8568A/B key allow you to select which legacy instrument to emulate. The selected instrument determines the response to the "ID?" command and affects the behavior of commands such as IP. You can use any command offered by any of the legacy instruments regardless of the language setting. However, if the command is not correct for the selected legacy instrument there is no guarantee that the command will work as expected. This does not affect the response to the SCPI command "*IDN?".

The legacy instrument selections are as follows:

8560E/EC   Selects the **8560E/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 1-5.

8561E/EC   Selects the **8561E/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 1-5.

8562E/EC   Selects the **8562E/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 1-5.

8563E/EC   Selects the **8563E/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 1-5. This is the default setting for the N9061A application.

8564E/EC   Selects the **8564E/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 1-5.

8565E/EC   Selects the **8565E/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 1-5.

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 1-5 on page 30.

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 1-5 on page 30.

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 1-5 on page 30.

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 1-5 on page 30.

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 X-Series signal analyzer.

Table 1-5   **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
8560E/EC	30 Hz	2.9 GHz	601	AC	1	91
8561E/EC	30 Hz	6.5 GHz	601	AC	1	91
8562E/EC	30 Hz	13.2 GHz	601	AC	1	91
8563E/EC	30 Hz	26.5 GHz	601	DC	1	91
8564E/EC	30 Hz	40 GHz	601	DC	1	91
8565E/EC	30 Hz	50 GHz	601	DC	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

Table 1-5 **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
HP8568B	0 Hz	1.5 GHz	1001	DC	3 (VBW one step wider than RBW)	106

Cmd Error

Turning **Cmd Error** On or Off enables or disables the display of the "CMD ERR" error messages. The default setting is On. The error message appears in the Message bar and also can be queried using "ERR?". The error message will occur if either the command syntax or any of its parameters are incorrectly formed. The selected value is preserved after presetting or power cycling the instrument. Disabling the display of command errors disables the display of all error types.

The format of the errors are as follows:

1.CMD ERR, <string>

This string will be limited to the first 20 characters of the input string (message unit).

Further details of these errors, after they have occurred, can be reviewed in the Cmd Error Log, as long as Cmd Error Logging is enabled.

Logging

The N9061A application allows the logging of errors. These errors comprise details of command errors and legacy commands that have been received but are not supported by the N9061A application. To enable and view the error log select the **Mode Setup** hardkey from the front panel. Then select the **Logging** softkey.

Figure 1-3   Logging Menu Map

```
                          ┌───────────────┐
        ( Logging )───────│    Logging    │
                          ├───────────────┤
                          │ Previous Page │
                          ├───────────────┤
                          │   Next Page   │
                          ├───────────────┤
                          │ Cmd Error Log │
                          │   On     Off  │
                          ├───────────────┤
                          │               │
                          ├───────────────┤
                          │               │
                          ├───────────────┤
                          │    Refresh    │
                          ├───────────────┤
                          │   Clear Log   │
                          └───────────────┘
```
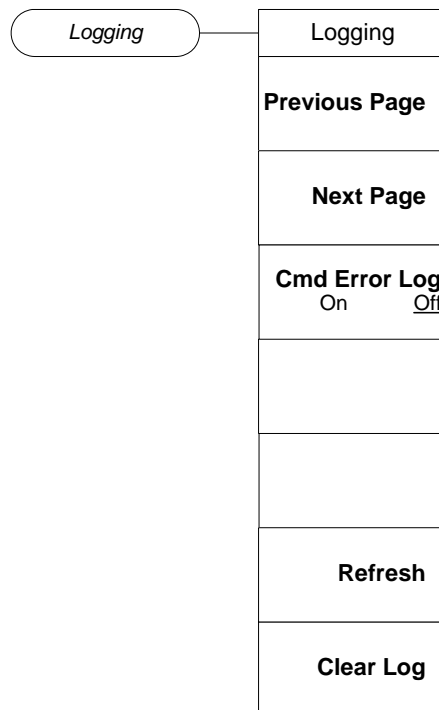
Previous Page/Next Page

When you are in the Logging menu, the main Signal Analysis display is obscured by the logging page. The most recent log starts from the bottom of the window. **Previous Page** and **Next Page** allow you to scroll through the log file. To include commands sent to the analyzer since the log window display was opened, press **Refresh**.

Cmd Error Log

The **Cmd Error Log** option allows you to turn the command error logging on or off. The default is **Off**. Logging should not be used in a secure environment. 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. Switching **Cmd Error Log** to **Off** does not clear the log file.

The log file is also stored as a text file, called `Logfile.txt`, on the instrument. It is stored in the `D:\` drive, in a folder called `\User_My_Documents\[USERNAME]\My Documents\RLC\data`.

The maximum size of the log is 10 MB. When the file reaches its maximum size, the first ten percent of the file is automatically discarded, to clear space for subsequent error messages.

Refresh

To update the log page with new entries, select **Refresh**.

Clear Log

The **Clear Log** softkey clears the error log.

The log can only be cleared by using the Clear Log function and cannot be cleared on power-up, remote language switch or mode switch.

Preferences

The Preferences menu allows you to configure some analyzer settings when in remote language compatibility mode. Figure 1-4 shows the Preferences menu map that is accessed by selecting the **Mode Setup** hardkey on the front panel and then selecting the **Preferences** softkey. Preferences are not affected by a power cycle, a remote language change, a mode switching or a mode preset. They are only preset to their default state using **Restore Mode Defaults** key in the Mode Setup menu (see Figure 1-2), INST:DEF or SYST:PRES:PERS command.

Figure 1-4   Preferences Menu Map
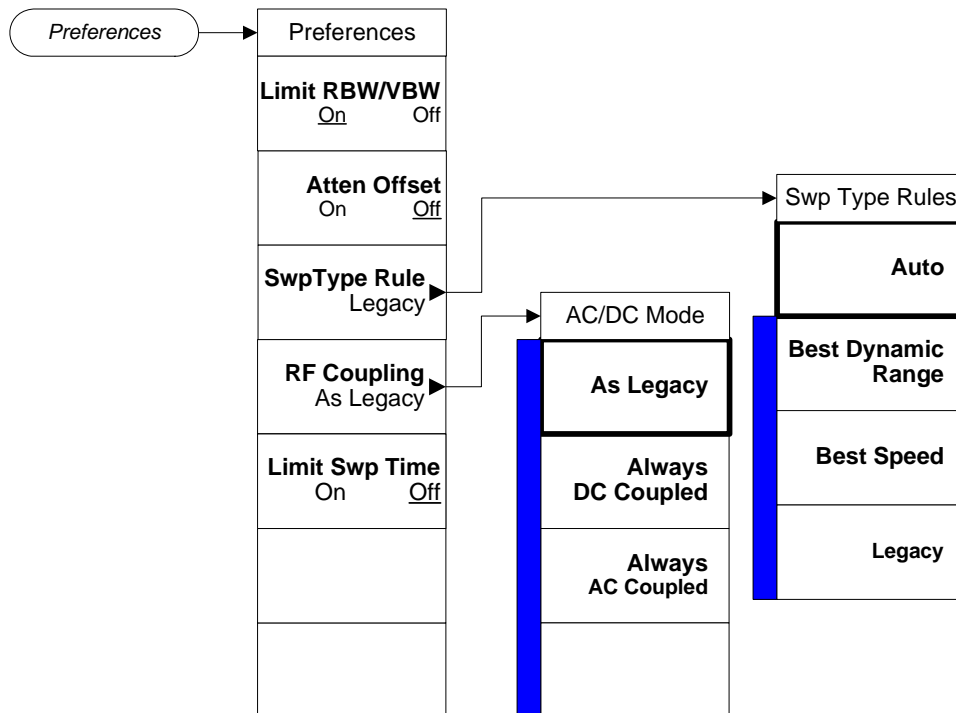
Limit RBW/VBW

Setting **Limit RBW/VBW** to **On** limits the valid resolution bandwidth (RBW) and video bandwidth (VBW) values to those appropriate for the currently selected remote language. While this limitation reduces measurement flexibility, it helps to ensure that the measurement time in emulation mode is the same as the legacy measurement time, and ensures that the responses to RB? and VB? match the legacy instrument. The default state is **Off**. Setting this key to **Off** causes the RBW and VBW filters to use the X-Series analyzer range of values for all remote languages.

Atten Offset

Setting **Atten Offset** to **On** allows larger input power to be applied to the analyzer, while significantly increasing the noise floor. Since many of the older spectrum analyzers had noise floor 10 dB higher than the X-Series analyzer, this gives the most accurate emulation. The default state is **Off**.

Sweep Type Rules

Sweep Type Rules changes the Auto rules for determining whether the instrument uses FFT or Swept mode (this can be manually overridden). FFT mode offers substantially faster measurements in some cases. The HP8566A/B, 8568A/B series did not have FFT mode capability, so most accurate emulation requires that the instrument preserves Swept mode unless you manually overrides that setting. The 8560-series analyzers use both FFT and Swept mode, in which case "Legacy" is equivalent to "Dynamic range".

RF Coupling

RF Coupling allows you to override the legacy instrument behavior for AC and DC coupling. This command is required because legacy instruments had AC cutoff frequencies of 100 kHz and the X-series analyzers have an AC cutoff frequency of 10 MHz.

As Legacy sets coupling to AC or DC whenever the legacy instrument would be set to AC or DC coupled mode via power on, preset, or an explicit command. Due to changes in the coupling cutoff frequency, measurement performance below 10 MHz while in AC-coupled mode may not match the legacy analyzer performance.

Always AC sets AC coupling while in Language Compatibility Mode, overriding other instrument settings including power on, preset, or an explicit command. This setting maximizes instrument robustness, and is recommended for instruments that are not used to measure signals below 10 MHz.

Always DC sets DC coupling while in Language Compatibility Mode, overriding other instrument settings including power on, preset, or explicit command. This will maximize instrument sensitivity to signals below 10 MHz, and may be required for measurements between 100 KHz and 10 MHz. When in this mode, extra care should be taken to ensure that DC voltage levels are within the allowable range for the X-Series analzysers.

Limit Sweep Time

Allows you to constrain the sweep time to no less than the minimum sweep time of the legacy instruments. If set to On, the sweep time will be constrained to no less than the value listed below. If set to Off, no constraint is applied.

Table 1-6   Minimum Sweep Time for the Legacy Instruments

Instrument	Sweep Time (None Zero Span)	Sweep Time (Zero Span)
HP8566A/B, HP8568A/B	20 ms	1 us
HP8560 series	50 ms	50 us

Restore Mode Defaults

Resets the state for the currently active mode by resetting the mode persistent setting to their default values and by performing a mode preset. This function will never cause a mode switch. This function performs a full preset on the active mode.

Send Commands

After you finish setting up the N9061A application, you can send the commands of the legacy products (8560 Series, 8566A/B, or 8568A/B) to X-Series analyzers. It is recomanded to use Agilent 82357B USB/GPIB interface and free instrument to PC connection tool Agilent IO Libraries Suite when you connct the instrument to a PC. For more details, visit:

http://www.agilent.com/find/82357B

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

NOTE	The commands can ONLY be sent via a GPIB connection. It will not work for a LAN connecttion.

Running Software that Requires SCPI Commands

When a legacy remote language has been selected, you 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 355 contains some useful information.

The SCPI commands available while using other remote languages are:

Table 1-7   **SCPI Commands**

SCPI Commands	Description
*IDN?	Queries and returns the instrument identification string.
*RST	Performs an instrument preset.
INSTrument:DEFault	Restores mode defaults.
INSTrument:SELect INSTrument:SELect?	Selects an application by mode name. (Use RLC to select the N9061A application)[1].
INSTrument:NSELect INSTrument:NSELect?	Selects an application by mode number. (Use 266 to select the N9061A application)[1].
[:SENSe]:SWEep:TYPE AUTO|SWEep|FFT [:SENSe]:SWEep:TYPE?	Sets the Sweep Type. Defaults to AUTO.
:SYSTem:OPTions?	Returns a list of installed options.
INPut:COUPling AC|DC|RLC INPut:COUPling?	Sets the input coupling.[2] Defaults to RLC.
:SYSTem:LANGuage HP8560E | HP8561E | HP8562E | HP8563E | HP8564E | HP8565E | HP8566A | HP8566B | HP8568A | HP8568B :SYSTem:LANGuage?	Sets the current remote language.[2]
:SYSTem:COMMunicate:RLBC:SCPI:ENABle ON|OFF	Toggles whether SCPI available in RLBC mode or not.
:SYSTem:COMMunicate:RLBC:SCPI:ENABle ON|OFF	Toggles whether SCPI available in RLBC mode or not.
[:SENSe]:RLC:SWEep:TYPE:AUTO:RULes AUTO|SPEed|DRANge|LEGACY [:SENSe]:RLC:SWEep:TYPE:AUTO:RULes?	Sets the auto rule setting for Sweep Type.[2]

Table 1-7   **SCPI Commands**

SCPI Commands	Description
[:SENSe]:RLC:BANDwidth:LIMit ON|OFF|1|0 [:SENSe]:RLC:BANDwidth:LIMit?	Toggles legacy bandwidth limiting on and off.[2]
[:SENSe]:RLC:ATTenuation:STATe ON|OFF|1|0 [:SENSe]:RLC:ATTenuation:STATe?	Toggles internal attenuation on and off.[2] Defaults to OFF.

1. After changing into or out of RLC mode, allow a 1s delay before sending subsequent commands.
2. This command is only available if the N9061A application is installed on your analyzer.

Service and Calibration

Since the Performance Verification and Adjustment Software uses the SCPI command language, you need to exit the N9061A (RLC) application and change to the Spectrum Analyzer application prior to calibration or service of your Agilent signal analyzer.

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, and the 8560 Series), and indicates which are supported in N9061A. Refer to the alphabetical listing of commands in Chapter 4 , "Programming Commands," on page 75 for more detailed information about each supported command.

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
A1	Clear-writes trace A	Yes	Yes	Yes	Page 79
A2	Max Holds trace A	Yes	Yes	Yes	Page 80
A3	View trace A	Yes	Yes	Yes	Page 81
A4	Blanks trace A	Yes	Yes	Yes	Page 82
ABORT	Interrupt operation of all user-defined functions	N/A	N/A	No	
ABS	Absolute	No	No	No	
ACP	Performs the adjacent channel power measurement	N/A	N/A	N/A	
ACPACCL	Accelerate adjacent channel power measurement	N/A	N/A	No	
ACPALPHA	Adjacent channel power alpha weighting	N/A	N/A	Yes	Page 83
ACPALTCH	Adjacent channel power alternate channels	N/A	N/A	Yes	Page 84
ACPBRPER	Adjacent channel power burst period	N/A	N/A	Yes	Page 85
ACPBRWID	Adjacent channel power burst width	N/A	N/A	Yes	Page 86
ACPBW	Specifies channel bandwidth for ACP measurement	N/A	N/A	Yes	Page 87
ACPCOMPUTE	Compute adjacent channel power	N/A	N/A	Yes	Page 88
ACPCONTM	Performs ACP measurement in continuous sweep	N/A	N/A	N/A	
ACPE	Adjacent channel power extended	N/A	N/A	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
ACPERR	ACP measurement error query	N/A	N/A	N/A	
ACPFRQWT	Adjacent channel power frequency weighting	N/A	N/A	Yes	Page 89
ACPGR	Adjacent channel power graph on or off	N/A	N/A	N/A	
ACPGRAPH	Compute adjacent channel power graph	N/A	N/A	No	
ACPLOWER	Lower adjacent channel power	N/A	N/A	Yes	Page 90
ACPMAX	Maximum adjacent channel power	N/A	N/A	Yes	Page 91
ACPMEAS	Measure adjacent channel power	N/A	N/A	Yes	Page 92
ACPMETHOD	Adjacent channel power measurement method	N/A	N/A	No	
ACPMK	Adjacent channel power marker on or off	N/A	N/A	N/A	
ACPMSTATE	Adjacent channel power measurement state	N/A	N/A	Yes	Page 93
ACPPAR	ACP manual or auto	N/A	N/A	N/A	
ACPPWRTX	Total power transmitted	N/A	N/A	Yes	Page 94
ACPRSLTS	Adjacent channel power measurement results	N/A	N/A	Yes	Page 95
ACPSNGLM	Performs ACP measurement in single sweep	N/A	N/A	N/A	
ACPSP	Channel spacing	N/A	N/A	Yes	Page 96
ACPT	Adjacent channel power T weighting	N/A	N/A	Yes	Page 97
ACPUPPER	Upper adjacent channel power	N/A	N/A	Yes	Page 98
ACTDEF	Give user-defined function active status	N/A	N/A	N/A	
ACTVF	Active function	N/A	N/A	N/A	
ACTVFUNC	Creates a user defined active function	N/A	N/A	No	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
ADD	Add	No	No	No	
ADJALL	LO & IF adjustment	N/A	N/A	Yes	Page 99
ADJCRT	Adjust CRT alignment	N/A	N/A	No	
ADJIF	Adjust IF	N/A	N/A	No	
AMB	Trace A − trace B -> trace A	Yes	Yes	Yes	Page 100
AMBPL	Trace A − trace B + Display Line -> trace A	Yes	Yes	Yes	Page 101
AMPCOR	Applies amplitude correction at specified frequencies	N/A	N/A	No	
AMPCORDATA	Amplitude correction data	N/A	N/A	No	
AMPCORSAVE	Save amplitude correction data	N/A	N/A	No	
AMPCORSIZE	Amplitude correction data array size	N/A	N/A	No	
AMPCORRCL	Amplitude correction recall	N/A	N/A	No	
AMPLEN	Amplitude correction length	N/A	N/A	N/A	
ANLGPLUS	Turns on or off the Analog+ display mode	N/A	N/A	N/A	
ANNOT	Display Annotation	Yes	Yes	Yes	Page 102
APB	Trace A + trace B -> trace A	Yes	Yes	Yes	Page 103
ARRAYDEF	Defines an array	N/A	N/A	No	
AT	Input Attenuation	Yes	Yes	Yes	Page 104
AUNITS	Amplitude Units	Yes	Yes	Yes	Page 106
AUTO	Auto couple	N/A	N/A	N/A	
AUTOCPL	Auto couple	N/A	N/A	Yes	Page 108
AUTOEXEC	Turns on or off the function defined with AUTOFUNC	N/A	N/A	No	
AUTOFUNC	Defines a function for automatic execution	N/A	N/A	No	
AUTOSAVE	Automatically saves trace	N/A	N/A	No	
AVG	Average	No	No	No	
AXB	Exchange Traces A & B	Yes	Yes	Yes	Page 109

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
B1	Clear-writes trace B	Yes	Yes	Yes	Page 110
B2	Max Holds trace B	Yes	Yes	Yes	Page 111
B3	View trace B	Yes	Yes	Yes	Page 112
B4	Blanks trace B	Yes	Yes	Yes	Page 113
BAUDRATE	Baud rate of spectrum analyzer	N/A	N/A	N/A	
BIT	Return or receive state of bit	N/A	N/A	N/A	
BITF	Bit flag	N/A	N/A	N/A	
BL	Trace B − Display line -> trace B	Yes	Yes	N/A	Page 114
BLANK	Blanks specified trace	Yes	Yes	Yes	Page 115
BML	Trace B − Display line -> trace B	Yes	Yes	Yes	Page 116
BRD	Bus Read	No	No	N/A	
BTC	Transfer trace B to C	Yes	Yes	N/A	Page 117
BWR	Bus Write	No	No	N/A	
BXC	Exchange Traces B & C	Yes	Yes	N/A	Page 118
C1	Turns off A - B	Yes	Yes	Yes	Page 119
C2	A − B -> A	Yes	Yes	Yes	Page 120
CA	Couples Attenuation	Yes	Yes	Yes	Page 121
CAL	Calibrate	N/A	N/A	N/A	
CARDLOAD	Copies data from memory card to module memory	N/A	N/A	No	
CARDSTORE	Copies data to memory card	N/A	N/A	No	
CARROFF	Carrier off power	N/A	N/A	No	
CARRON	Carrier on power	N/A	N/A	Yes	Page 123
CAT	Catalog	N/A	N/A	N/A	
CATALOG	Catalog	N/A	N/A	No	
CF	Center Frequency	Yes	Yes	Yes	Page 124
CHANNEL	Channel selection	N/A	N/A	Yes	Page 126

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
CHANPWR	Channel power	N/A	N/A	Yes	Page 127
CHP	Performs the channel power measurement	N/A	N/A	N/A	
CHPGR	Channel power graph on or off	N/A	N/A	N/A	
CHPWRBW	Channel power bandwidth	N/A	N/A	Yes	Page 128
CLRAVG	Reset avg. counter to 1	Yes	Yes	N/A	Page 129
CLRBOX	Clears a rectangular area on the analyzer display	N/A	N/A	N/A	
CLRDSP	Clear display	N/A	N/A	No	
CLRSCHED	Clears autosave & autoexec schedule buffer	N/A	N/A	No	
CLRW	Clear-writes specified trace	Yes	Yes	Yes	Page 130
CLS	Clear status byte	N/A	N/A	N/A	
CMDERRQ	Command error query	N/A	N/A	N/A	
CNF	Confidence test	N/A	N/A	N/A	
CNTLA	Auxiliary interface control line A	N/A	N/A	No	
CNTLB	Auxiliary interface control line B	N/A	N/A	No	
CNTLC	Auxiliary interface control line C	N/A	N/A	No	
CNTLD	Auxiliary interface control line D	N/A	N/A	No	
CNTLI	Auxiliary interface control line input	N/A	N/A	No	
CNVLOSS	Selects ref level offset to calibrate amplitude display	No	N/A	No	
COMB	Turns the comb generator on or off	N/A	N/A	N/A	
COMPRESS	Compress	No	No	N/A	
CONCAT	Concat	No	No	N/A	
CONTS	Continuous sweep mode	Yes	Yes	Yes	Page 132

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
CORREK	Correction factors on	N/A	N/A	N/A	
COUPLE	Selects AC or DC coupling	N/A	N/A	Yes	Page 133
CR	Couples Resolution BW	Yes	Yes	Yes	Page 134
CRTHPOS	Horizontal position of CRT display	N/A	N/A	N/A	
CRTVPOS	Vertical position of CRT display	N/A	N/A	N/A	
CS	Couples Step Size	Yes	Yes	Yes	Page 135
CT	Couples Sweep Time	Yes	Yes	Yes	Page 136
CTA	Converts display units to dBm	No	No	N/A	
CTM	Converts dBm to display units	No	No	N/A	
CTRLHPIB	Allows SA to control HP-IB	N/A	N/A	No	
CV	Couples Video Bandwidth	Yes	Yes	Yes	Page 137
D1	Sets display to normal size	No	No	N/A	
D2	Sets display to full CRT size	No	No	N/A	
D3	Sets display to expanded size	No	No	N/A	
DA	Display Memory Address	Yes	Yes	N/A	Page 138
DATEMODE	Set the date display format	N/A	N/A	No	
DD	Display write binary	No	No	N/A	
DELMKBW	Occupied power bandwidth within delta marker	N/A	N/A	Yes	Page 139
DEMOD	Turns the demodulator on or off	N/A	N/A	No	
DEMODAGC	Demodulation automatic gain control	N/A	N/A	No	
DEMODT	Demodulation time	N/A	N/A	No	
DET	Detection Mode	Yes	Yes	Yes	Page 140
DISPOSE	Frees Memory	No	No	No	
DIV	Divide	No	No	No	
DL	Display Line Level	Yes	Yes	Yes	Page 141
DLE	Turns the display line on/off	Yes	Yes	N/A	Page 143

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
DLYSWP	Delay sweep	N/A	N/A	Yes	Page 144
DN	Reduces the active function by applicable step size	N/A	N/A	N/A	
DONE	Synchronizing function	Yes	Yes	Yes	Page 145
DOTDENS	Sets the dot density value in Analog+ display mode	N/A	N/A	N/A	
DR	Display Memory Address Read	Yes	Yes	N/A	Page 146
DRAWBOX	Draws a rectangular box on analyzer display	N/A	N/A	N/A	
DSPLY	Display	No	No	No	
DT	Define Terminator	No	No	N/A	
DW	Display Memory Address Write	No	No	N/A	
E1	Active marker to maximum signal	Yes	Yes	Yes	Page 147
E2	Active marker to center frequency	Yes	Yes	Yes	Page 148
E3	Active marker frequency to CF step size	Yes	Yes	Yes	Page 149
E4	Active marker to reference level	Yes	Yes	Yes	Page 150
EDITDONE	Indicates limit line editing is complete	N/A	N/A	Yes	Page 151
EDITLIML	Allows current limit line to be edited	N/A	N/A	No	
EE	Enable entry	No	No	N/A	
EK	Enable knob	No	No	N/A	
ELSE	Conditional Programming (If…then…else…endif)	No	No	No	
EM	Erase trace C memory	No	No	No	
ENDIF	Conditional Programming (If…then…else…endif)	No	No	N/A	
ENTER	Enter from HP-IB	No	No	No	
EP	Enter parameter function	N/A	N/A	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
ERASE	User memory & registers erased	No	No	N/A	
ERR	Queries the error queue	Yes	Yes	Yes	Page 152
ET	Elapsed time	N/A	N/A	Yes	Page 154
EX	Exchanges trace A & B	Yes	Yes	Yes	Page 155
EXP	Exponential	No	No	No	
EXTMXR	Presets external mixing mode	No	N/A	No	
FA	Start frequency	Yes	Yes	Yes	Page 156
FB	Stop frequency	Yes	Yes	Yes	Page 157
FDIAG	Frequency diagnostics	N/A	N/A	No	
FDSP	Frequency display off	N/A	N/A	Yes	Page 158
FFT	Fast fourier transform	No	No	No	
FFTAUTO	Marker to Auto FFT	N/A	N/A	N/A	
FFTCLIP	FFT signal clipped	N/A	N/A	N/A	
FFTCONTS	FFT continuous sweep	N/A	N/A	N/A	
FFTKNL	Fast fourier transform kernel	No	No	N/A	
FFTMKR	FFT markers	N/A	N/A	N/A	
FFTMM	FFT marker to midscreen	N/A	N/A	N/A	
FFTMS	FFT marker to FFT stop frequency	N/A	N/A	N/A	
FFTOFF	FFT off	N/A	N/A	N/A	
FFTPCTAM	FFT percent amplitude modulation	N/A	N/A	N/A	
FFTPCTAMR	FFT percent amplitude modulation readout	N/A	N/A	N/A	
FFTSNGLS	FFT single sweep	N/A	N/A	N/A	
FFTSTAT	FFT status	N/A	N/A	N/A	
FFTSTOP	FFT stop frequency	N/A	N/A	N/A	
FMGAIN	FM gain	N/A	N/A	N/A	
FOFFSET	Frequency offset	Yes	Yes	Yes	Page 159

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
FORMAT	Erase & format the selected memory device	N/A	N/A	No	
FPKA	Fast preselector peak	Yes	N/A	N/A	Page 161
FREF	Frequency reference	N/A	N/A	Yes	Page 162
FS	Full frequency span	Yes	Yes	Yes	Page 163
FULBAND	Set start/stop freq for ext mixing bands	No	N/A	No	
FUNCDEF	Function definition	No	No	No	
GATE	Turn time-gating on or off	N/A	N/A	Yes	Page 166
GATECTL	Gate control	N/A	N/A	Yes	Page 167
GC	Gate preset	N/A	N/A	N/A	
GD	Gate delay	N/A	N/A	Yes	Page 168
GDRVCLPAR	Clear pulse parameters	N/A	N/A	N/A	
GDRVGDEL	Gate Delay for the frequency window	N/A	N/A	N/A	
GDRVGLEN	Gate length for frequency & time windows	N/A	N/A	N/A	
GDRVGT	Turns gate in frequency window on or off	N/A	N/A	N/A	
GDRVGTIM	Gate trigger to marker position for time window	N/A	N/A	N/A	
GDRVPRI	Pulse repetition interval	N/A	N/A	N/A	
GDRVPWID	Pulse width	N/A	N/A	N/A	
GDRVRBW	Couple resolution bandwidth to pulse width	N/A	N/A	N/A	
GDRVREFE	Enter reference edge	N/A	N/A	N/A	
GDRVST	Couple sweep time to pulse repetition interval	N/A	N/A	N/A	
GDRVSWAP	Update the time or frequency window	N/A	N/A	N/A	
GDRVSWDE	Delay sweep for time window	N/A	N/A	N/A	

Table 2-1   Alphanumeric List of all Legacy Commands Showing their N9061A Support

Command	Description	8566	8568	8560 Series	Page for Further Details
GDRVSWP	Sweep time for the time window	N/A	N/A	N/A	
GDRVUTIL	Turns the gate utility on or off	N/A	N/A	N/A	
GDRVVBW	Couple video bandwidth to the gate length	N/A	N/A	N/A	
GETPLOT	Get plot	N/A	N/A	N/A	
GETPRNT	Get print	N/A	N/A	N/A	
GL	Gate length	N/A	N/A	Yes	Page 169
GP	Sets the polarity (positive/negative) of the gate trigger	N/A	N/A	Yes	Page 170
GR	Plot GPIB input as Graphs	No	No	N/A	
GRAT	Graticule on/off	Yes	Yes	Yes	Page 171
HAVE	Checks for options installed	N/A	N/A	N/A	
HD	Holds data entry	No	No	No	Page 172
HN	Harmonic number	N/A	N/A	N/A	
HNLOCK	Harmonic lock	No	N/A	No	
HNUNLK	Harmonic band unlock	No	N/A	No	
I1	Sets the RF coupling to AC	N/A	Yes	N/A	Page 173
I2	Sets the RF coupling to DC	N/A	Yes	N/A	Page 175
IB	Input to trace B memory	No	No	N/A	
ID	Instrument identification	Yes	Yes	Yes	Page 177
IDCF	Identified signal to center frequency	N/A	N/A	No	
IDFREQ	Identified signal frequency	N/A	N/A	No	
IDSTAT	Signal identifier status	No	N/A	N/A	
IF	Conditional Programming (If…then…else…endif)	No	No	No	
IFTKNL	16 bit discrete fourier transform	No	No	N/A	
INT	Integer	No	No	No	
INZ	Input impedance	N/A	N/A	N/A	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
IP	Instrument preset	Yes	Yes	Yes	Page 178
KEYCLR	Clear user defined keys	N/A	N/A	No	
KEYCMD	Define function & label of softkey	N/A	N/A	N/A	
KEYDEF	Assign function to soft key	No	No	No	
KEYENH	Key enhance	N/A	N/A	N/A	
KEYEXC	Executes specified soft key	No	No	N/A	
KEYLBL	Relabels softkey without changing its function	N/A	N/A	N/A	
KS,	Mixer level	Yes	Yes	N/A	Page 179
KS=	HP8566: Selects factory preselector setting HP8568: Marker counter frequency resolution	Yes	Yes	No	Page 180
KS(	Locks the save registers	Yes	Yes	N/A	Page 181
KS)	Unlocks the save registers	Yes	Yes	N/A	Page 182
KS>	Specifies preamp gain for signal input 2	N/A	No	N/A	
KS<	Specifies preamp gain for signal input 1	N/A	No	N/A	
KS|	Display memory address write	No	No	N/A	
KS#	Turns off YTX self-heating correction	No	N/A	N/A	
KS/	Allows preselector to be peaked manually	No	N/A	N/A	
KS123	Returns up to 1001 words display memory	No	No	N/A	
KS125	Writes up to 1001 display memory words	No	No	N/A	
KS126	Returns every Nth value of a trace	No	No	N/A	
KS127	Sets analyzer to accept binary display write	No	No	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
KS39	Writes display memory address in fast binary	No	No	N/A	
KS43	Sets SRQ 102 when frequency limit exceeded	No	No	N/A	
KS91	Returns the amplitude error	No	No	N/A	
KS92	Specifies value DL, TH, active mkr in display units	No	No	N/A	
KS94	Returns code for harmonic number in binary	No	No	N/A	
KSA	Sets amplitude units to dBm	Yes	Yes	N/A	Page 183
KSa	Selects normal detection	Yes	Yes	N/A	Page 184
KSB	Sets amplitude units to dBmV	Yes	Yes	N/A	Page 185
KSb	Selects positive peak detection	Yes	Yes	N/A	Page 186
KSC	Sets amplitude units to dBuV	Yes	Yes	N/A	Page 187
KSc	Trace A + trace B -> trace A	Yes	Yes	N/A	Page 188
KSD	Sets amplitude units to V	Yes	Yes	N/A	Page 189
KSd	Selects negative peak detection	Yes	Yes	N/A	Page 190
KSE	Sets the analyzer title mode	Yes	Yes	N/A	Page 191
KSe	Selects sample detection	Yes	Yes	N/A	Page 192
KSF	HP8566: Shifts the YTO HP8568: Measures the Sweep Time	No	No	N/A	
KSf	Recover last instrument state at power on	No	No	N/A	
KSG	Turns on video averaging	Yes	Yes	N/A	Page 193
KSg	Turns off the display	Yes	Yes	N/A	Page 194
KSH	Turns off video averaging	Yes	Yes	N/A	Page 195
KSh	Turns on the display	Yes	Yes	N/A	Page 196
KSI	Allows the reference level to be extended	No	No	N/A	
KSi	Exchanges traces B & C	Yes	Yes	N/A	Page 197

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
KSJ	Manual control of DACs	No	No	N/A	
KSj	Views trace C	Yes	Yes	N/A	Page 198
KSK	HP8566: Active Mkr to next highest peak HP8568: Counts pilot IF at marker	Yes	No	N/A	Page 199
KSk	Blanks trace C	Yes	Yes	N/A	Page 200
KSL	Turns off marker noise function	Yes	Yes	N/A	Page 201
KSl	Moves trace B into trace C	Yes	Yes	N/A	Page 202
KSM	Turns on marker noise function	Yes	Yes	N/A	Page 203
KSm	Turns off the graticule	Yes	Yes	N/A	Page 204
KSN	Marker minimum value detected	Yes	No	N/A	Page 205
KSn	Turns on the graticule	Yes	Yes	N/A	Page 206
KSO	Marker span	Yes	Yes	N/A	Page 207
KSo	Turns off the annotation	Yes	Yes	N/A	Page 208
KSP	GPIB address	No	No	N/A	
KSp	Turns on the annotation	Yes	Yes	N/A	Page 209
KSQ	Unlocks frequency band	No	No	N/A	
KSq	Decouples IF gain and input attenuation	No	No	N/A	
KSR	Turns on service diagnostics	No	No	N/A	
KSr	Sets service request 102	No	No	N/A	
KSS	HP8566: Fast GPIB operation HP8568: Determine second LO frequency	No	No	N/A	
KST	HP8566: Fast preset HP8568: Shifts second LO down	Yes	No	N/A	Page 210
KSt	HP8566: Locks frequency band HP8568: Continues sweep from marker	No	No	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
KSU	HP8566: External mixer preset HP8568: Shift second LO up	No	No	N/A	
KSu	Stops the sweep at the active marker	No	No	N/A	
KSV	Frequency offset	Yes	Yes	N/A	Page 211
KSv	HP8566: External mixer frequency identifier HP8568: Inhibits phase lock	No	No	N/A	
KSW	Amplitude error correction routine	No	No	N/A	
KSw	Displays amplitude error correction routine	No	No	N/A	
KSX	Amplitude correction factors on	No	No	N/A	
KSx	Sets trigger mode to external	Yes	Yes	N/A	Page 212
KSY	Amplitude correction factors off	No	No	N/A	
KSy	Sets trigger mode to video	Yes	Yes	N/A	Page 213
KSZ	Reference level offset	Yes	Yes	N/A	Page 214
KSz	Sets the display storage address	No	No	N/A	
L0	Turns off the display line	Yes	Yes	Yes	Page 215
LB	Writes text label	No	No	No	
LCLVAR	Defines a local variable for use	N/A	N/A	No	
LF	Preset 0–2.5GHz	Yes	N/A	N/A	Page 216
LG	Selects log scale	Yes	Yes	Yes	Page 217
LIMD	Delta amplitude value for limit line segment	N/A	N/A	Yes	
LIMF	Frequency value for limit-line segment	N/A	N/A	Yes	Page 219
LIMIDEL	Erase contents of limit line table	N/A	N/A	N/A	
LIMIDISP	Controls when the limit line(s) are displayed	N/A	N/A	N/A	
LIMIFAIL	Limit line fail	N/A	N/A	Yes	Page 220

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
LIMIFT	Select frequency or time limit line	N/A	N/A	N/A	
LIMIHI	Upper limit	N/A	N/A	N/A	
LIMILINE	Limit line	N/A	N/A	N/A	
LIMILO	Lower limit	N/A	N/A	N/A	
LIMIMIRROR	Mirror limit line	N/A	N/A	N/A	
LIMIMODE	Limit line entry mode	N/A	N/A	N/A	
LIMIPURGE	Disposes of current limit line, not limit line table	N/A	N/A	Yes	Page 221
LIMIRCL	Load stored limit line into limit line table	N/A	N/A	No	
LIMIREL	Determine whether limit line values absolute/relative	N/A	N/A	Yes	Page 222
LIMISAV	Save contents of limit line table for recall	N/A	N/A	No	
LIMISEG	Define slope & offset of limit line segments	N/A	N/A	N/A	
LIMISEGT	Enter limit line segment for sweep time	N/A	N/A	N/A	
LIMITEST	Compare active trace data to limit line parameters	N/A	N/A	Yes	
LIML	Amplitude value for limit line segment in lower limit line	N/A	N/A	Yes	Page 223
LIMM	Middle amplitude value for limit-line segment	N/A	N/A	Yes	
LIMTFL	Specifies a flat limit-line segment	N/A	N/A	No	
LIMTSL	Specifies a sloped limit-line segment	N/A	N/A	Yes	Page 224
LIMU	Amplitude value for limit line segment in upper limit line	N/A	N/A	Yes	Page 225
LINFILL	Line fill	N/A	N/A	N/A	
LL	Provides lower left recorder output voltage at rear	No	No	N/A	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
LN	Selects linear scale	Yes	Yes	Yes	Page 226
LOAD	Load article/file into internal memory	N/A	N/A	N/A	
LOG	Log	No	No	No	
LOLIMOFF	LO Limit Off	No	No	N/A	
LSPAN	Last span	N/A	N/A	N/A	
M1	Turns off all markers	Yes	Yes	Yes	Page 227
M2	Marker Normal	Yes	Yes	Yes	Page 228
M3	Marker Delta	Yes	Yes	Yes	Page 229
M4	Marker zoom	Yes	Yes	N/A	Page 230
MA	Returns the amplitude of active marker	Yes	Yes	Yes	Page 231
MBIAS	Mixer bias	N/A	N/A	No	
MBRD	Processor memory block read	No	No	N/A	
MBWR	Processor memory block write	No	No	N/A	
MC0	Turns off the marker frequency counter	N/A	Yes	N/A	Page 232
MC1	Turns on the marker frequency counter	N/A	Yes	N/A	Page 233
MDS	Measurement data size	Yes	Yes	N/A	Page 234
MDU	Measurement data units	No	No	N/A	
MEAN	Returns mean value of trace in display units	Yes	Yes	Yes	Page 235
MEANPWR	Mean power measurement	N/A	N/A	Yes	Page 236
MEANTH	Trace mean above threshold	N/A	N/A	N/A	
MEAS	Measurement status	N/A	N/A	No	
MEASOFF	Measurement off	N/A	N/A	N/A	
MEASURE	Measure mode	N/A	N/A	N/A	
MEM	Returns amount of memory available	No	No	No	
MENU	Menu	N/A	N/A	No	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
MERGE	Merge two traces	No	No	N/A	
MF	Returns frequency of the active marker	Yes	Yes	Yes	Page 238
MIN	Minimum	No	No	No	
MINH	Min Hold	N/A	N/A	Yes	Page 239
MINPOS	Returns the minimum position in the trace	Yes	Yes	N/A	Page 240
MIRROR	Mirror image of the trace	No	No	N/A	
MKA	Amplitude of the active marker	Yes	Yes	Yes	Page 241
MKACT	Specifies the active marker	Yes	Yes	N/A	Page 242
MKACTV	Marker as the active function	N/A	N/A	N/A	
MKBW	Marker bandwidth	N/A	N/A	Yes	Page 243
MKCF	Moves the active marker to center frequency	Yes	Yes	Yes	Page 244
MKCHEDGE	Marker to channel edge	N/A	N/A	No	
MKCONT	Continues sweeping from the marker after stop	No	No	N/A	
MKD	Delta marker	Yes	Yes	Yes	Page 245
MKDELCHBW	Delta markers to channel power bandwidth	N/A	N/A	No	
MKDLMODE	Marker delta display line mode	N/A	N/A	N/A	
MKDR	Reciprocal of marker delta	N/A	N/A	No	
MKF	Specifies the frequency of the active marker	Yes	Yes	Yes	Page 246
MKFC	Turns the marker frequency counter on or off	N/A	Yes	Yes	Page 247
MKFCR	Specifies the marker frequency counter resolution	N/A	Yes	Yes	Page 248
MKMCF	Marker mean to center frequency	N/A	N/A	No	
MKMIN	Moves active marker to minimum signal detected	Yes	Yes	Yes	Page 250

Table 2-1   Alphanumeric List of all Legacy Commands Showing their N9061A Support

Command	Description	8566	8568	8560 Series	Page for Further Details
MKN	Normal marker	Yes	Yes	Yes	Page 251
MKNOISE	Marker noise function	Yes	Yes	Yes	Page 252
MKOFF	Turns all markers or the active marker off	Yes	Yes	Yes	Page 253
MKP	Specifies the horizontal position of the marker	Yes	Yes	N/A	Page 254
MKPAUSE	Pauses the sweep at the active marker	No	No	N/A	
MKPK	Marker peak	Yes	Yes	Yes	Page 255
MKPT	Marker peak threshold	N/A	N/A	Yes	Page 256
MKPX	Marker peak excursion	Yes	Yes	Yes	Page 257
MKREAD	Specifies marker readout mode	Yes	Yes	N/A	Page 258
MKRL	Moves the active marker to reference level	Yes	Yes	Yes	Page 260
MKSP	Marker span	Yes	Yes	Yes	Page 261
MKSS	Marker step size	Yes	Yes	Yes	Page 262
MKSTOP	Stops the sweep at the active marker	No	No	N/A	
MKT	Position marker in units of time	N/A	N/A	Yes	Page 263
MKTBL	Marker table	N/A	N/A	N/A	
MKTRACE	Marker trace	Yes	Yes	N/A	Page 264
MKTRACK	Turns the marker signal track on or off	Yes	Yes	Yes	Page 265
MKTYPE	Specifies the type of active marker to be used	Yes	Yes	N/A	Page 266
ML	Mixer Level	Yes	Yes	Yes	Page 267
MOD	Modulo	No	No	No	
MODE	Mode of operation	N/A	N/A	N/A	
MODRCLT	Recalls trace from module memory	N/A	N/A	No	
MODSAVT	Saves trace in module memory	N/A	N/A	No	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
MOV	Move	No	No	No	
MPY	Multiply	No	No	No	
MRD	Memory Read	No	No	N/A	
MRDB	Memory read byte	No	No	N/A	
MSDEV	Specifies mass storage device	N/A	N/A	No	
MSI	Mass storage interface	N/A	N/A	N/A	
MT0	Turns off marker signal track	Yes	Yes	Yes	Page 269
MT1	Turns on marker signal track	Yes	Yes	Yes	Page 270
MWR	Memory Write	No	No	N/A	
MWRB	Memory write byte	No	No	N/A	
MXM	Maximum	No	No	No	
MXMH	Max Hold	Yes	Yes	Yes	Page 271
MXRMODE	Mixer mode	N/A	N/A	No	
NDB	Number of dB	N/A	N/A	N/A	
NDBPNT	Turns the N dB points function on or off	N/A	N/A	N/A	
NDBPNTR	N dB points bandwidth	N/A	N/A	N/A	
NORMLIZE	Normalize trace data	N/A	N/A	Yes	Page 272
NRL	Normalized reference level	N/A	N/A	Yes	Page 273
NRPOS	Normalized reference position	N/A	N/A	Yes	Page 274
NSTART	Start harmonic	No	N/A	N/A	
NSTOP	Stop harmonic	No	N/A	N/A	
O1	Output format	Yes	Yes	N/A	Page 275
O2	Output format	Yes	Yes	N/A	Page 276
O3	Output format	Yes	Yes	N/A	Page 277
O4	Output format	Yes	Yes	N/A	Page 278
OA	Returns the active function value	Yes	Yes	N/A	Page 279
OBW	Occupied bandwidth	N/A	N/A	N/A	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
OBWBW	Bandwidth measured by occupied bandwidth	N/A	N/A	N/A	
OBWFERR	Occupied bandwidth transmit frequency error	N/A	N/A	N/A	
OBWLOWER	Relative lower frequency limit of occupied bandwidth	N/A	N/A	N/A	
OBWPCT	Occupied bandwidth percent	N/A	N/A	N/A	
OBWPWR	Total power in the occupied bandwidth	N/A	N/A	N/A	
OBWUPPER	Relative upper frequency limit of occupied bandwidth	N/A	N/A	N/A	
OCCUP	Percent occupied power bandwidth	N/A	N/A	Yes	Page 280
OL	Output learn string	Yes	Yes	N/A	Page 281
ONCYCLE	On cycle	N/A	N/A	N/A	
ONDELAY	On delay	N/A	N/A	N/A	
ONEOS	On end of sweep	No	No	No	
ONMKR	On marker pause	N/A	N/A	N/A	
ONMKRU	On marker update	N/A	N/A	N/A	
ONPWRUP	On power up	N/A	N/A	N/A	
ONSRQ	On service request	N/A	N/A	N/A	
ONSWP	On sweep	No	No	N/A	
ONTIME	On time	N/A	N/A	N/A	
OP	Output parameters	No	No	No	
OR	Set position of origin	N/A	N/A	No	
OT	Output trace annotations	Yes	Yes	N/A	Page 284
OUTPUT	Output - sending data to the GPIB from function	No	No	No	
PA	Plot absolute	No	No	No	
PARSTAT	Parallel status	N/A	N/A	N/A	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
PCTAM	Turns the percent AM measurement on or off	N/A	N/A	N/A	
PCTAMR	Percent AM response	N/A	N/A	N/A	
PD	Pen down	No	No	No	
PDA	Probability distribution amplitude	No	No	No	
PDF	Probability distribution frequency	No	No	No	
PEAKS	Sorts the signal peaks by amplitude/frequency	Yes	Yes	Yes	Page 285
PKDLMODE	Peak table delta display line mode	N/A	N/A	N/A	
PKPOS	Peak position	Yes	Yes	N/A	Page 286
PKRES	Peak result	N/A	N/A	N/A	
PKSORT	Selects how to sort signal peaks listed in peak table	N/A	N/A	N/A	
PKTBL	Turns the peak table on or off	N/A	N/A	N/A	
PKZMOK	Peak zoom okay	N/A	N/A	N/A	
PKZOOM	Peak zoom	N/A	N/A	N/A	
PLOT	Prints the screen	Yes	Yes	Yes	Page 287
PLOTORG	Display origins	N/A	N/A	No	
PLOTSRC	Plot source	N/A	N/A	No	
PLTPRT	Plot port	N/A	N/A	N/A	
POWERON	Power on state	N/A	N/A	N/A	
PP	Peaks the preselector	Yes	N/A	Yes	Page 288
PR	Plot relative	No	No	No	
PREAMPG	External preamplifier gain	N/A	N/A	N/A	
PREFX	Change user memory entries file prefix	N/A	N/A	N/A	
PRINT	Print	N/A	N/A	Yes	Page 289
PRNPRT	Print port	N/A	N/A	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
PRNTADRS	Print address	N/A	N/A	N/A	
PS	Skip page	No	No	N/A	
PSDAC	Preselector DAC number	N/A	N/A	No	
PSTATE	Protect state	N/A	N/A	No	
PU	Pen up	No	No	No	
PURGE	Purge file	N/A	N/A	N/A	
PWRBW	Power bandwidth	Yes	Yes	Yes	Page 290
PWRUPTIME	Power up time	N/A	N/A	N/A	
Q0	Sets detector to EMI Peak detection	No	No	N/A	
Q1	Sets detector to Quasi Peak detection	No	No	N/A	
R1	Resets service request 140	Yes	Yes	N/A	Page 291
R2	Allows service request 140 & 104	Yes	Yes	N/A	Page 292
R3	Allows service request 140 & 110	Yes	Yes	N/A	Page 293
R4	Allows service request 140 & 102	Yes	Yes	N/A	Page 294
RB	Resolution bandwidth	Yes	Yes	Yes	Page 295
RBR	Resolution bandwidth/Span ratio	N/A	N/A	Yes	Page 297
RC	Recalls state register	Yes	Yes	Yes	Page 298
RCLOSCAL	Recall open/short average	N/A	N/A	No	
RCLS	Recall state	Yes	Yes	Yes	Page 299
RCLT	Recall trace	N/A	N/A	No	
RCLTHRU	Recall internal thru-reference trace into trace B	N/A	N/A	No	
RELHPIB	Release control of GPIB	N/A	N/A	No	
REPEAT	Conditional Programming (Repeat .. Until …)	No	No	No	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
RESETRL	Reset reference level	N/A	N/A	N/A	
RETURN	Return to user defined function origination point	N/A	N/A	No	
REV	Returns the revision string to the controller	Yes	Yes	Yes	Page 300
RL	Reference level	Yes	Yes	Yes	Page 301
RLCAL	Reference level calibration	N/A	N/A	No	
RLPOS	Reference level position	N/A	N/A	N/A	
RMS	Root mean square	Yes	Yes	Yes	Page 303
ROFFSET	Reference level offset	Yes	Yes	Yes	Page 304
RQS	SRQ mask	Yes	Yes	Yes	Page 305
S1	Continuous sweep mode	Yes	Yes	Yes	Page 306
S2	Single sweep mode	Yes	Yes	Yes	Page 307
SADD	Adds a limit line segment	N/A	N/A	No	
SAVEMENU	Save menu	N/A	N/A	N/A	
SAVES	Saves analyzer state to specified register	Yes	Yes	Yes	Page 308
SAVET	Save trace	N/A	N/A	No	
SAVRCLF	Save or recall flag	N/A	N/A	N/A	
SAVRCLN	Save or recall number	N/A	N/A	N/A	
SAVRCLW	Save or recall data	N/A	N/A	N/A	
SDEL	Deletes a limit line segment	N/A	N/A	No	
SDON	Indicates limit line segment is done	N/A	N/A	No	
SEDI	Edits limit line segment	N/A	N/A	No	
SEGDEL	Delete specified segment from limit line tables	N/A	N/A	N/A	
SENTER	Segment entry for frequency limit lines	N/A	N/A	No	
SENTERT	Segment entry for sweep time limit lines	N/A	N/A	N/A	

Table 2-1 **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
SER	Serial number	N/A	N/A	Yes	Page 309
SETDATE	Set the date of spectrum analyzer	N/A	N/A	Yes	Page 310
SETTIME	Set the time of spectrum analyzer	N/A	N/A	Yes	Page 311
SHOWMENU	Shows menu	N/A	N/A	No	
SIGDEL	Signal amplitude delta	No	N/A	N/A	
SIGID	External mixing frequency bands signal identifier	No	N/A	No	
SKYCLR	Clears user softkey	N/A	N/A	No	
SKYDEF	Defines user softkey	N/A	N/A	No	
SMOOTH	Smooths given trace over specified number points	Yes	Yes	Yes	Page 312
SNGLS	Single sweep mode	Yes	Yes	Yes	Page 313
SP	Frequency Span	Yes	Yes	Yes	Page 314
SPEAKER	Turns the internal speaker on or off	N/A	N/A	N/A	
SPZOOM	Span Zoom	N/A	N/A	N/A	
SQLCH	Sets the squelch threshold	N/A	N/A	N/A	
SQR	Square root	No	No	No	
SQUELCH	Adjusts squelch level	N/A	N/A	No	
SRCALC	Selects internal or external level control	N/A	N/A	No	
SRCAT	Attenuate source output level	N/A	N/A	N/A	
SRCCRSTK	Coarse tracking adjust	N/A	N/A	No	
SRCFINTK	Fine tracking adjust	N/A	N/A	No	
SRCNORM	Source normalization	N/A	N/A	N/A	
SRCPOFS	Offset source power level	N/A	N/A	No	
SRCPSTP	Select source power step size	N/A	N/A	No	
SRCPSWP	Select sweep range of source output	N/A	N/A	No	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
SRCPWR	Select source power level	N/A	N/A	No	
SRCTK	Adjust tracking of source output with SA sweep	N/A	N/A	N/A	
SRCTKPK	Auto adjust tracking of source output with SA sweep	N/A	N/A	No	
SRQ	Service request	Yes	Yes	Yes	Page 316
SS	Frequency Step Size	Yes	Yes	Yes	Page 317
ST	Sweep Time	Yes	Yes	Yes	Page 318
STB	Status byte query	N/A	N/A	Yes	Page 320
STDEV	Standard deviation of trace amplitude	Yes	Yes	Yes	Page 321
STOR	Store file	N/A	N/A	N/A	
STOREOPEN	Save current instrument state	N/A	N/A	No	
STORESHORT	Store short	N/A	N/A	No	
STORETHRU	Store thru-calibration trace in trace B	N/A	N/A	No	
SUB	Subtract	No	No	No	
SUM	Sum of trace element amplitudes in display units	No	No	Yes	Page 322
SUMSQR	Squares trace element amplitudes & returns sum	No	No	No	
SV	Saves state	Yes	Yes	Yes	Page 324
SW	Skip to next control instruction	No	No	N/A	
SWPCPL	Sweep couple	N/A	N/A	Yes	Page 325
SWPOUT	Sweep output	N/A	N/A	No	
SYNCMODE	Synchronize mode	N/A	N/A	N/A	
T0	Turns the threshold level off	No	No	N/A	
T1	Sets the trigger mode to free run	Yes	Yes	Yes	Page 326
T2	Sets the trigger mode to line	Yes	Yes	Yes	Page 327
T3	Sets the trigger mode to external	Yes	Yes	Yes	Page 328
T4	Sets the trigger mode to video	Yes	Yes	Yes	Page 329

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
T7	Sets the trigger mode to level	No	No	N/A	
T8	Sets the trigger mode to edge	No	No	N/A	
TA	Returns trace A amplitude values to controller	Yes	Yes	Yes	Page 330
TB	Returns trace B amplitude values to controller	Yes	Yes	Yes	Page 331
TDF	Trace data format	Yes	Yes	Yes	Page 332
TEXT	Writes text on the analyzer screen	No	No	No	
TH	Threshold	Yes	Yes	Yes	Page 333
THE	Turns the threshold on or off	Yes	Yes	N/A	Page 334
THEN	Conditional Programming (If…then…else…endif)	No	No	No	
TIMEDATE	Allows setting of time & date for analyzer	N/A	N/A	Yes	Page 335
TIMEDSP	Enables display of time & data on analyzer display	N/A	N/A	N/A	
TITLE	Title entry	N/A	N/A	Yes	Page 336
TM	Trigger Mode	Yes	Yes	Yes	Page 337
TOI	Third order intermodulation measurement	N/A	N/A	N/A	
TOIR	Third order intermodulation response	N/A	N/A	N/A	
TRA	Returns trace A amplitude values to controller	Yes	Yes	Yes	Page 338
TRB	Returns trace B amplitude values to controller	Yes	Yes	Yes	Page 339
TRC	Returns trace C amplitude values to controller	Yes	Yes	N/A	Page 340
TRCMEM	Trace C memory	N/A	N/A	N/A	
TRDEF	Trace define	No	No	No	
TRDSP	Trace display	Yes	Yes	N/A	Page 341
TRGRPH	Trace graph display	No	No	N/A	

Table 2-1   **Alphanumeric List of all Legacy Commands Showing their N9061A Support**

Command	Description	8566	8568	8560 Series	Page for Further Details
TRIGPOL	Trigger polarity	N/A	N/A	Yes	Page 342
TRMATH	Executes specified trace math at end of sweep	No	No	N/A	
TRPRST	Sets trace operations to their preset values	No	No	N/A	
TRSTAT	Returns current trace states to controller	Yes	Yes	N/A	Page 343
TS	Takes a sweep	Yes	Yes	Yes	Page 344
TVLINE	Selects which horizontal line of video to trigger on	N/A	N/A	N/A	
TVLSFRM	Selects the type of video frame to trigger on	N/A	N/A	N/A	
TVSTND	TV standard	N/A	N/A	N/A	
TVSYNC	Selects polarity of video modulation to trigger on	N/A	N/A	N/A	
TWNDOW	Formats trace information for FFT.	N/A	N/A	No	
UNTIL	Conditional Programming (Repeat…Until…)	No	No	No	
UP	Increases active function value by applicable step	N/A	N/A	N/A	
UR	Upper right x-y recorder output voltage at rear	No	No	N/A	
USTATE	Configures user defined states	No	No	N/A	
VARDEF	Variable definition	No	No	No	
VARIANCE	Returns the amplitude variance of specified trace	No	No	No	
VAVG	Turns video averaging on or off	Yes	Yes	Yes	Page 345
VB	Video Bandwidth	Yes	Yes	Yes	Page 347
VBO	Video Bandwidth Coupling Offset	Yes	Yes	N/A	Page 349
VBR	Video Bandwidth Ratio	N/A	N/A	Yes	Page 350

Table 2-1   Alphanumeric List of all Legacy Commands Showing their N9061A Support

Command	Description	8566	8568	8560 Series	Page for Further Details
VIEW	Stores and views the specified trace	Yes	Yes	Yes	Page 351
VTL	Video trigger level	N/A	N/A	Yes	Page 353
WAIT	Suspend program operation for specified time	N/A	N/A	N/A	
WINNEXT	Next window	N/A	N/A	N/A	
WINOFF	Turns off the window display mode	N/A	N/A	N/A	
WINON	Turns on the window display mode	N/A	N/A	N/A	
WINZOOM	Window zoom	N/A	N/A	N/A	
XCH	Exchanges the two specified traces.	Yes	Yes	N/A	Page 354
ZMKCNTR	Zone marker at center frequency	N/A	N/A	N/A	
ZMKPKNL	Zone marker for next peak left	N/A	N/A	N/A	
ZMKPKNR	Zone marker for next peak right	N/A	N/A	N/A	
ZMKSPAN	Zone marker span	N/A	N/A	N/A	

3 Hints and Tips

This chapter includes a list of helpful hints and tips that will help you get the most from the N9061A application on your X-Series analyzer.

Hints and Tips

These pages lists a few hints and tips that will help you get the most from your analyzer and the N9061A application.

- **Compatibility - speed and consistency** - for best compatibility with your legacy analyzer, the N9061A application 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 8563E with its 26.5 GHz upper frequency limit is X-Series analyzer which also has an upper frequency limit of 26.5 GHz.

- **Compatibility and Sweep Times** - for best compatibility between X-Series analyzers and the legacy analyzers, use the Manual Swept mode for 8566A/B, 8568A/B Series analyzers. Manual Swept mode is the default setting on X-Series analyzers with N9061A installed.
  When analyzing stationary signals, you can change to the Best Speed setting, which is accessed from the **Mode Setup > Preferences > Swp Type Rule** menu. This results in faster sweep times on a X-Series analyzer than on the legacy analyzers because of the X-Series analyzer's better performance. In the majority of applications, this faster speed would be desirable, but that is not always the case.

- **Time-out** - 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 **Preferences > Swp Type Rule** menu (accessed from the Mode Setup 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.

- **Changing Modes** - After changing into or out of RLC mode, allow at least a 1 second delay before sending subsequent commands.

- **AC and DC Coupling** - The 8560 Series of legacy analyzers have one RF input port, and support AC and DC coupling through the COUPLE command .

  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

---

WARNING **If the input signal to the X-series analyzer has a DC component, ensure that when you select a legacy instrument with a possible coupling change to DC, the input signal does not exceed the input specifications of the X-series analyzer.**

The X-series analyzers also have one RF input port. When using the X-Series analyzers, you must use DC coupling to see calibrated frequencies of less than 20 MHz. Signals of less than 20 MHz are not

calibrated when using AC coupling on these analyzers.

Hints and Tips

4   Programming Commands

This chapter lists all the supported 8560 Series, 8566A/B and 8568A/B 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 User's Guide.

Command Syntax

Command syntax is represented pictorially.
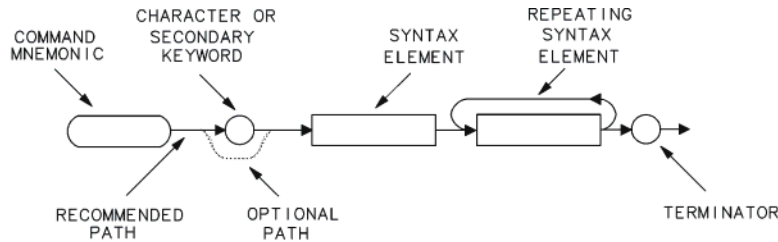
- Ovals enclose command mnemonics. The command mnemonic must be entered as shown with the exception that the case can be upper or lower.

- 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 as shown with the exception that the case can be upper or lower.

- 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.

Table 4-1   Syntax Elements

Syntax Component	Definition/Range
Analyzer command	Any 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.

Table 4-1   **Syntax Elements**

Syntax Component	Definition/Range
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 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	Line feed (L_F) and end-or-identify (EOI) condition. ASCII code 10 (line feed) is sent via GPIB and 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, W, MW, UW
	
	    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 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 code to your X-Series analyzer. For a fuller description of the commands, refer to the 8566A/B, 8568A/B, 8560 Series Operating and Programming Manual.

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
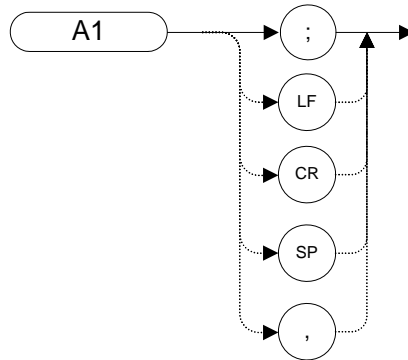
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The A1 command sets Trace A to clear write which means that it continuously displays any signal present at the analyzer input. The A1 command initially clears Trace A, setting all elements to zero.

NOTE	The functions of the command A1 are identical to the CLRW TRA command (page 130).

A2 [two]
Maximum Hold for Trace A

Syntax
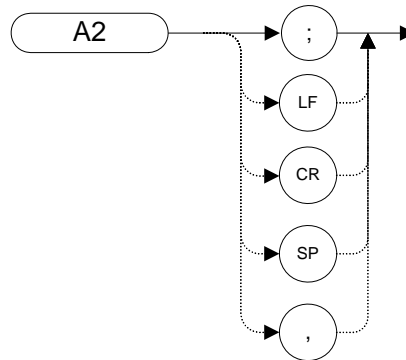
Legacy Products

8560 series, 8566A/B, 8568A/B

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 271).

A3 [three]
View Mode for Trace A

Syntax
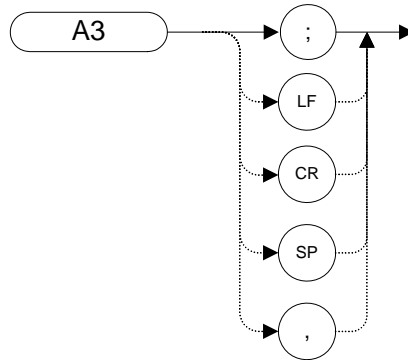
Legacy Products

8560 series, 8566A/B, 8568A/B

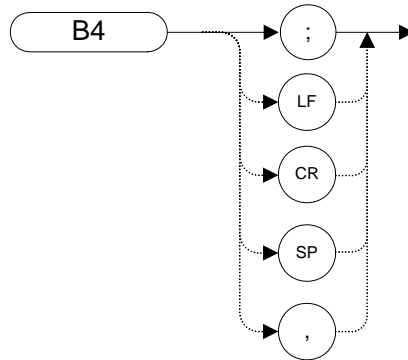## Description

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 351).

A4 [four]
Blank Trace A

Syntax
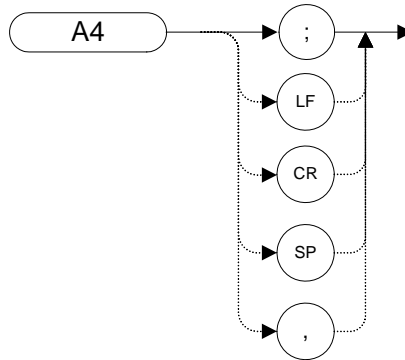
Legacy Products

8560 series, 8566A/B, 8568A/B
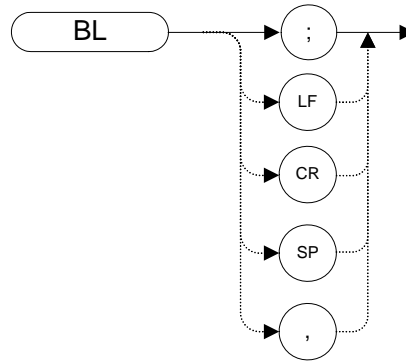
Description

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 115).

ACPALPHA
Adjacent Channel Power Alpha Weighting

Syntax
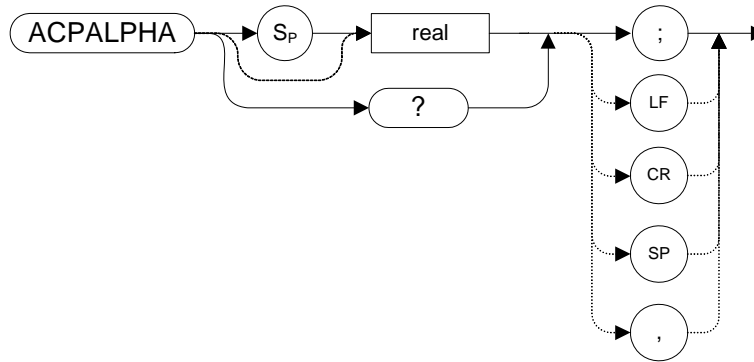
Legacy Products

8560 series

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

```
ACPALTCH ──▶ Sᴘ ──▶ 0 ──┐──▶ ; ──▶
              │     1 ──┤     LF
              │     2 ──┤     CR
              └──▶ ? ───┘     SP
                              ,
```
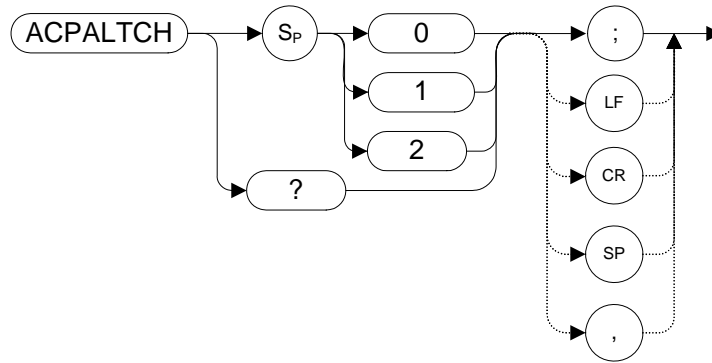
Legacy Products

8560 series

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 95).

Range: 0, 1, or 2.

Default value: 0.

ACPBRPER
Adjacent Channel Power Burst Period

Syntax
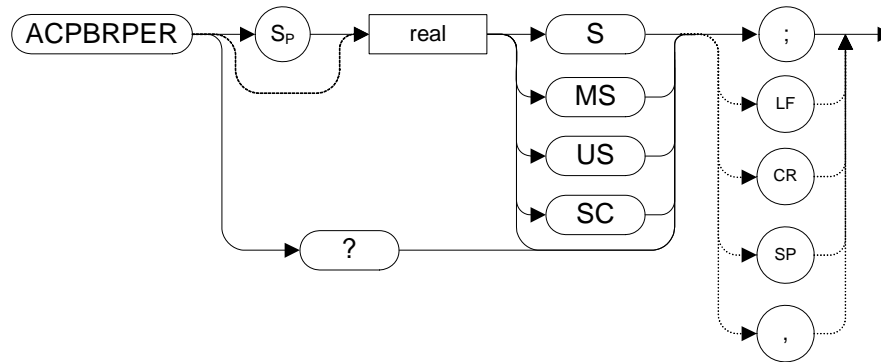
Legacy Products

8560 series

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	The N9061A application supports the ACP measurement using the ANALOG method only and therefore, although the user can set ACPBRPER, it does not do anything when in RLC mode.

ACPBRWID
Adjacent Channel Power Burst Width

Syntax
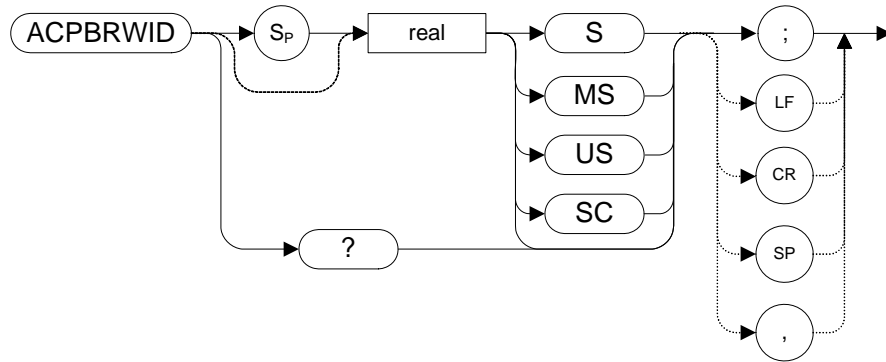
Legacy Products

8560 series

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   The N9061A application supports the ACP measurement using the ANALOG method only and therefore, although the user can set ACPBRWID, it does not do anything when in RLC mode.

ACPBW
Adjacent Channel Power Bandwidth
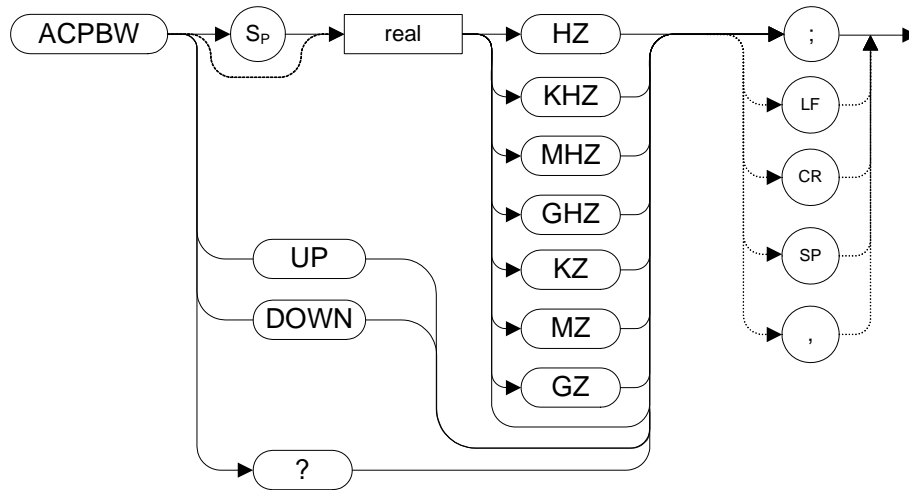
Syntax

Legacy Products

8560 series

Description

The ACPBW command sets the bandwidth of the channels as an active function for the ACPMEAS (page 92) and ACPCOMPUTE (page 88) commands.

ACPCOMPUTE
Adjacent Channel Power Compute

Syntax
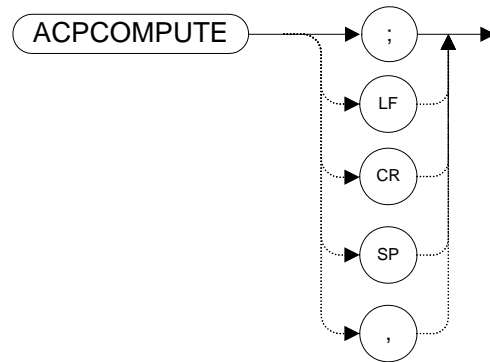
Legacy Products

8560 series

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	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPFRQWT
Adjacent Channel Power Frequency Weighting

Syntax
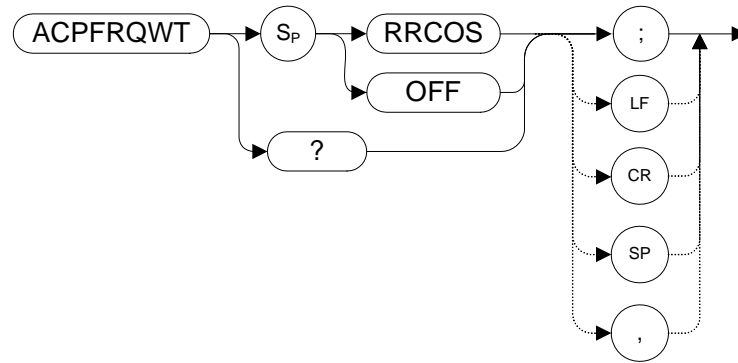
Legacy Products

8560 series

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	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPLOWER
Lower Adjacent Channel Power

Syntax
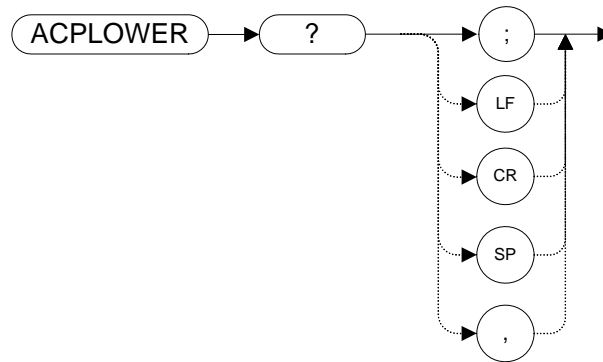
Legacy Products

8560 series

Description

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

NOTE	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPMAX
Maximum Adjacent Channel Power

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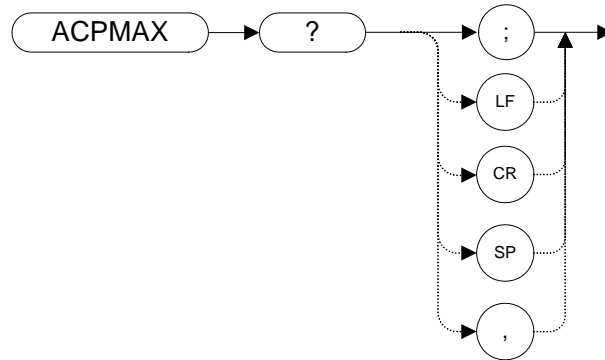
The ACPMAX query command returns the maximum adjacent channel power of the adjacent channel power measurement.

NOTE	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPMEAS
Measure Adjacent Channel Power

Syntax
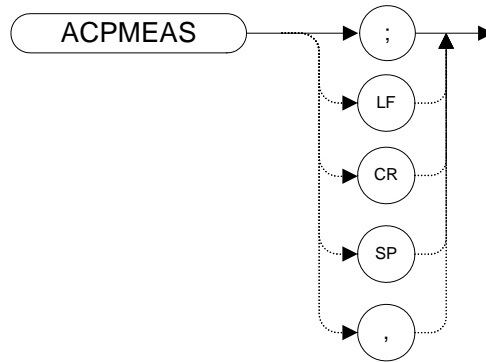
Legacy Products

8560 series

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	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPMSTATE
Adjacent Channel Power Measurement State

Syntax
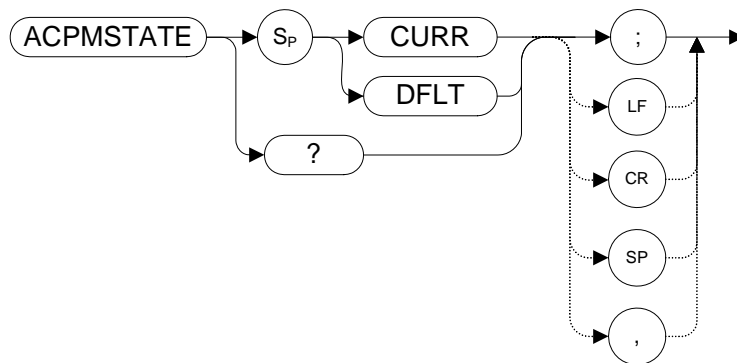
Legacy Products

8560 series

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   The N9061A application supports the ACP measurement using the ANALOG method only.

ACPPWRTX
Adjacent Channel Power Total Power Transmitted

Syntax
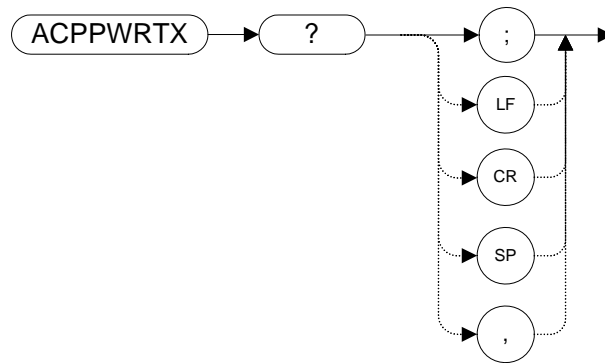
Legacy Products

8560 series

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	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPRSLTS
Adjacent Channel Power Measurement Results

Syntax
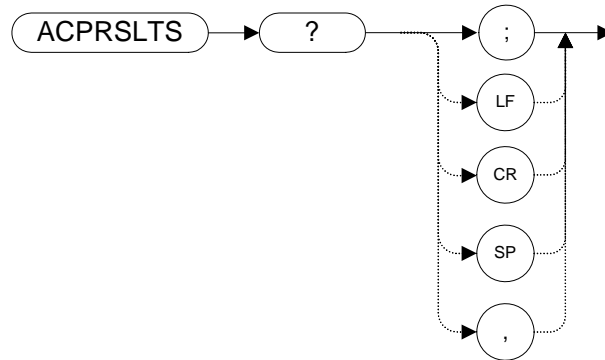
Legacy Products

8560 series

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 84) command determines the size of the array.

NOTE	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPSP
Adjacent Channel Power Channel Spacing

Syntax
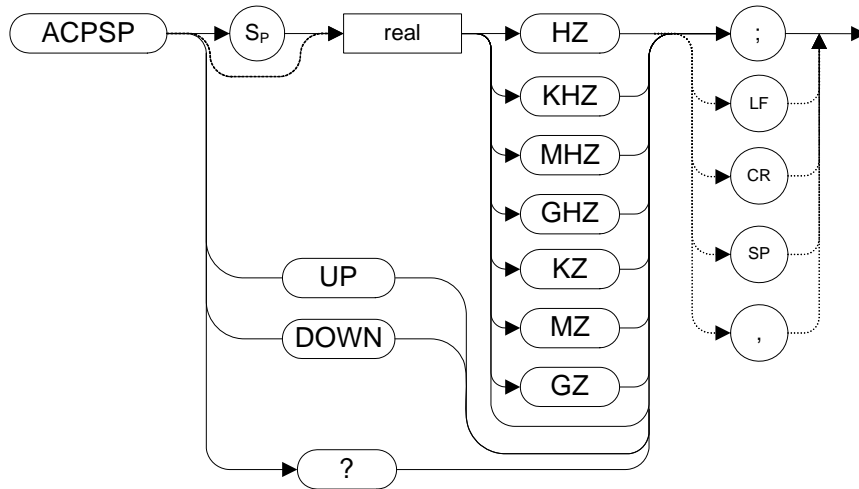
Legacy Products

8560 series

Description

Sets the channel spacing for the ACPMEAS (page 92) and ACPCOMPUTE (page 88) commands.

NOTE	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPT
Adjacent Channel Power T Weighting

Syntax
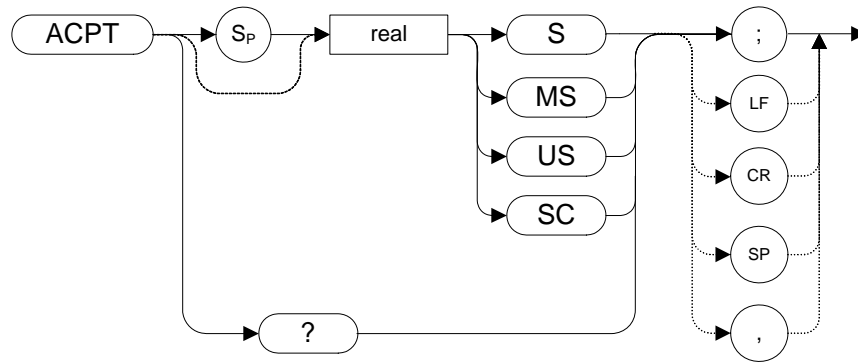
Legacy Products

8560 series

Description

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

NOTE	The N9061A application supports the ACP measurement using the ANALOG method only.

ACPUPPER
Upper Adjacent Channel Power

Syntax
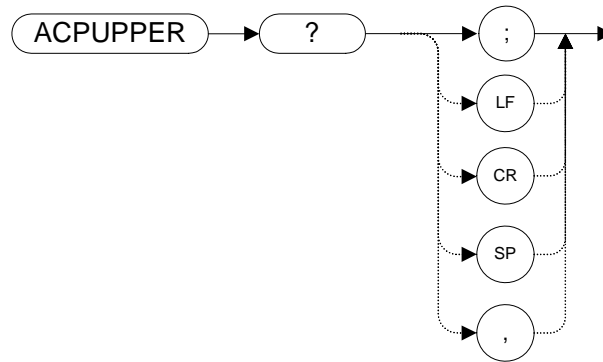
Legacy Products

8560 series

Description

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

NOTE	The N9061A application supports the ACP measurement using the ANALOG method only.

ADJALL
LO and IF Adjustments

Syntax
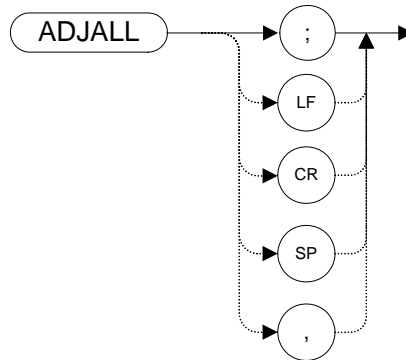
Legacy Products

8560 series

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 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
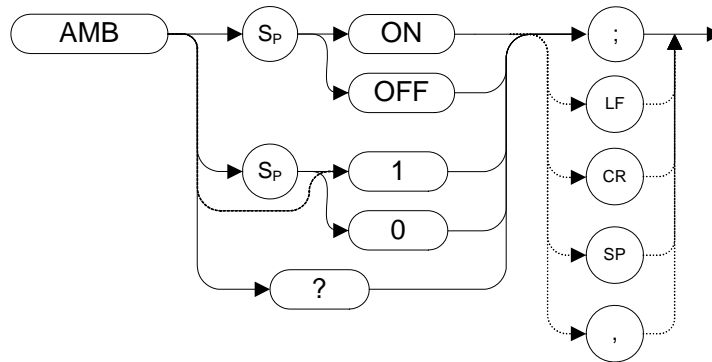
Legacy Products

8560 series, 8566A/B, 8568A/B

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 103) or a KSc (page 188) 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 Series languages all return either **ON** or **OFF**.

NOTE	The functions of the command AMB are identical to the C2 **[two]** command (page 120).

AMBPL
(A minus B) plus Display Line into A

Syntax

8560 series:
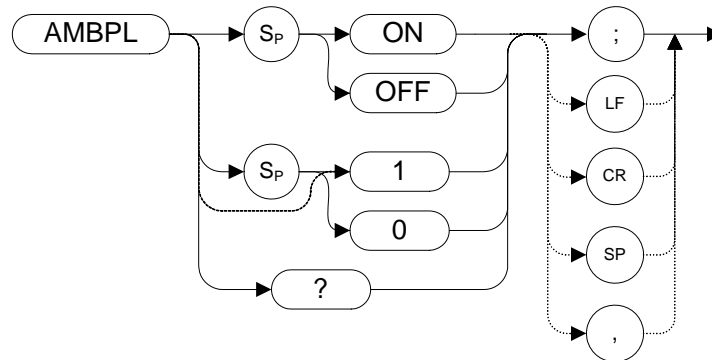
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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.

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

Query response is either 1 or 0, indicating ON or OFF state for 8560 series, is ON or OFF indicating state for 8566A/B, 8568A/B.

ANNOT
Annotation

Syntax
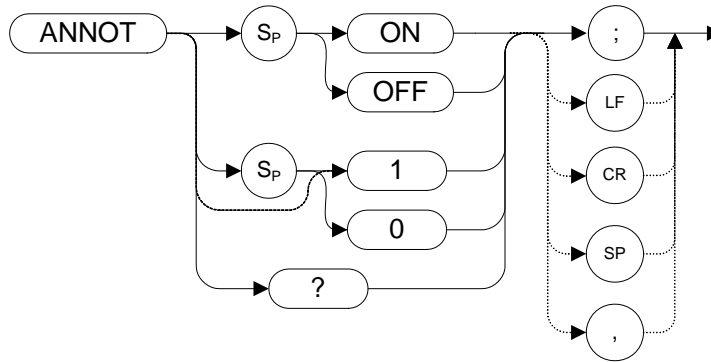
Preset State: ANNOT ON

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The ANNOT command turns on or off all annotation on the 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 208) and KSp command (page 209). 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
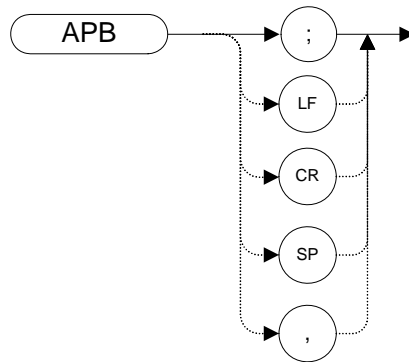
Legacy Products

8560 series, 8566A/B, 8568A/B

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 100) or a C2 (page 120) command has been executed.

NOTE	The functions of the command APB are identical to the KSc command (page 188). Note also that the alternative command, KSc, is only valid when the remote language is either HP8566A, HP8566B, HP8568A, or HP8568B.

AT
Input Attenuation

Syntax

8560 Series:
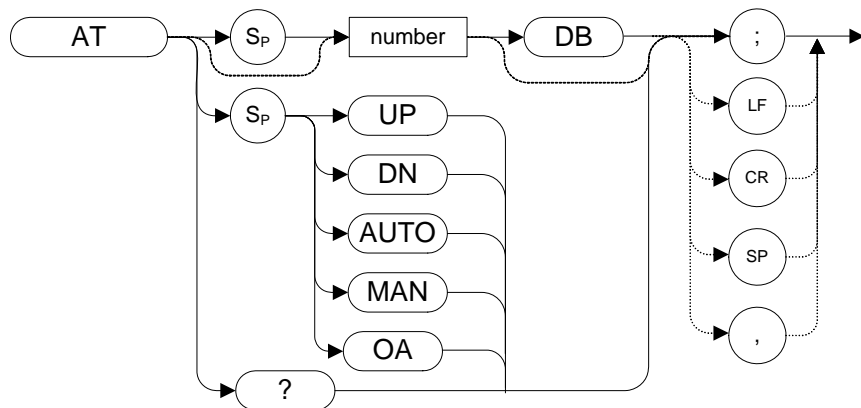
8566A/B, 8568A/B:
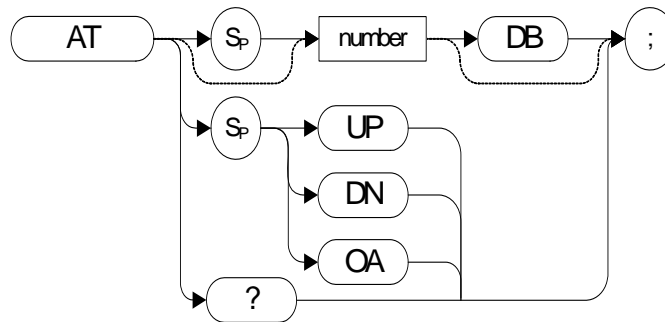
Table 4-2

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 switches 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[1]

1. The range is limited to 0 to 60 dB if 8564E/EC or 8565E/EC is selected.

Preset State: 10 dB

Step Increment: 10 dB

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Specifies the RF input attenuation.

Although the attenuation level in the X-series of 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.

NOTE	In PXA/MXA, the auto attenuation range is 6-70 dB and in EXA, it is 6-60 dB.

CAUTION	Signal levels above +30 dBm will damage the signal 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
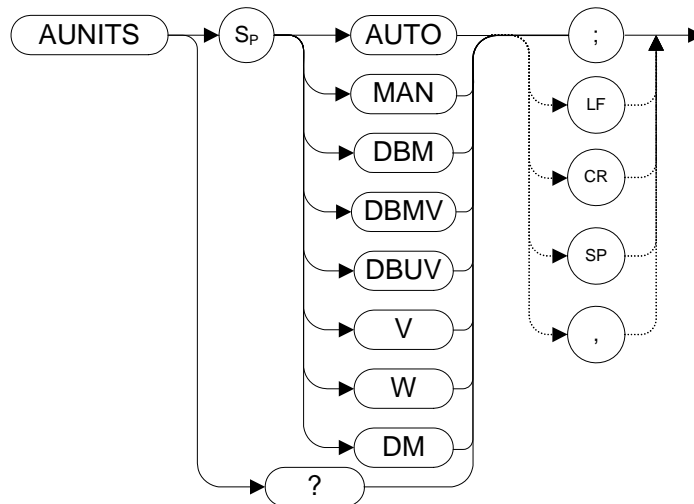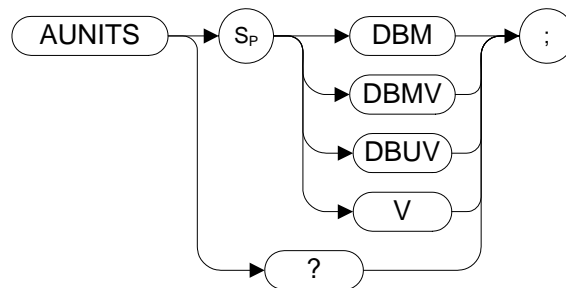
8566A/B, 8568A/B

Legacy Products

8560 series, 8566A/B, 8568A/B

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 analyzers, If the AUNITS setting is AUTO, then a change from log scale (LG) to linear scale (LN) automatically changes the AUNITS setting. For all other settings, no change to AUNITS occurs, even when the scale is changed.

NOTE	The functions of the command AUNITS are identical to the commands KSA (page 183), KSB (page 185), KSC (page 187), and KSD (page 189). 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.

AUTOCPL
Auto Coupled

Syntax
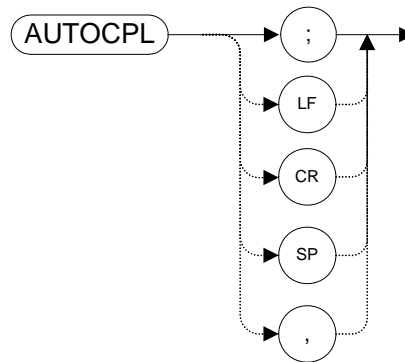
Legacy Products

8560 series

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
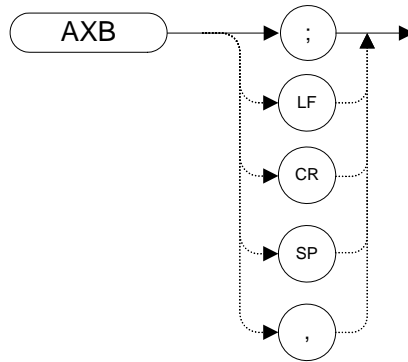
Syntax

Legacy Products

8560 series, 8566A/B, 8568A/B

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 155) and to the XCH TRA,TRB command (page 354).

B1 [one]
Clear Write for Trace B

Syntax
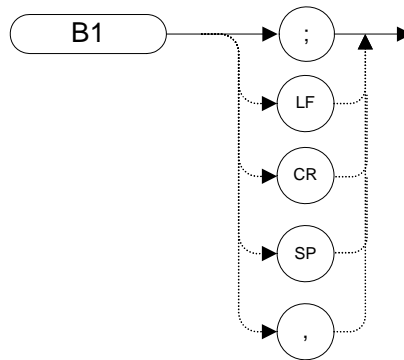
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The B1 command sets Trace B to clear write. That is, it continuously displays any signal present at the 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 130).

B2 [two]
Maximum Hold for Trace B

Syntax
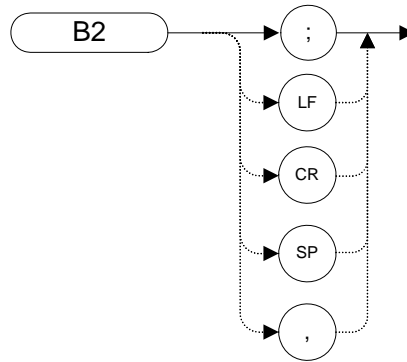
Legacy Products

8560 series, 8566A/B, 8568A/B

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 271).

B3 [three]
View Mode for Trace B

Syntax
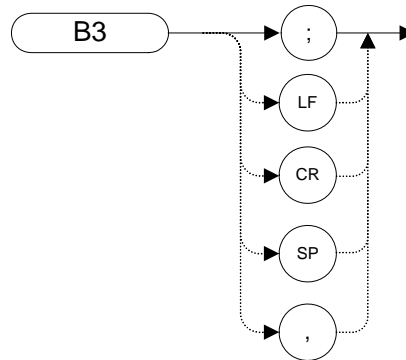
Legacy Products

8560 series, 8566A/B, 8568A/B

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 351).

B4 [four]
Blank Trace B

Syntax

Legacy Products

8560 series, 8566A/B, 8568A/B

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 115).

BL
Trace B minus Display Line to Trace B

Syntax

Legacy Products

8566A/B, 8568A/B

Description

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

The command BL is calculated differently depending on the language being used; for the 8560 Series the calculation is performed in units of dBm.

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.

NOTE	The functions of the command BL are identical to the BML command (page 116).

BLANK
Blank Trace

Syntax

8560 Series:
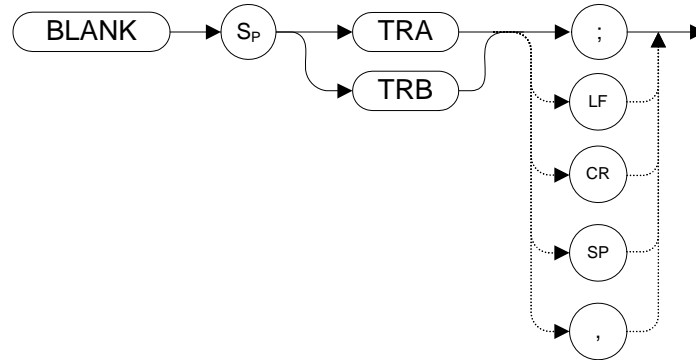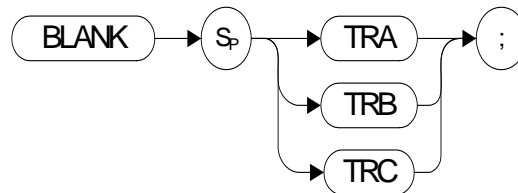
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

For information on the trace settings of the X-series analyzers, see Table 4-4, "Legacy Products command mapping to X-series for trace/detector settings."

NOTE	The functions of the command BLANK are identical to A4 (page 82), B4 (page 113) or KSJ, and KSk command (page 200) command.

BML
Trace B Minus Display Line

Syntax
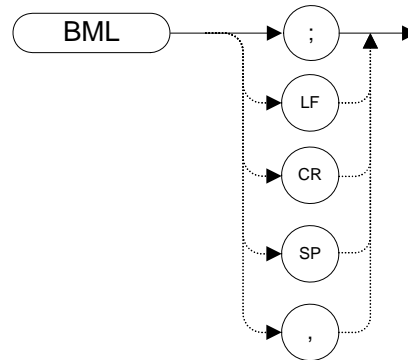
Legacy Products

8560 series, 8566A/B, 8568A/B

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.

The command BML is calculated differently depending on the language being used; for the 8560 Series the calculation uses units of dBm.

For the 8566A, HP8566B, HP8568A, HP8568B - the BML command uses display units.

NOTE	The functions of the command BML are identical to the BL command (page 114).

BTC
Transfer Trace B to Trace C

Syntax

$$\text{BTC} \longrightarrow ;$$

Legacy Products

8566A/B, 8568A/B

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 .

BXC
Exchange Trace B and Trace C

Syntax

$$\boxed{\text{BXC}} \longrightarrow \bigcirc ;$$

Legacy Products

8566A/B, 8568A/B

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 197) and to the XCH TRB,TRC command (page 354).

C1 [one]
Set A Minus B Mode Off

Syntax
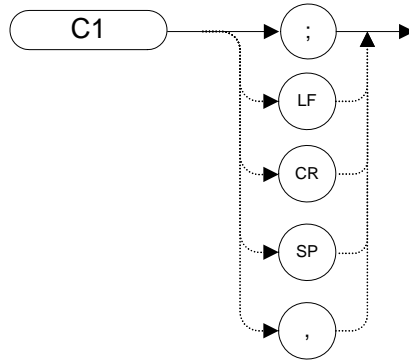
Legacy Products

8560 series, 8566A/B, 8568A/B

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 or by the AMB ON command .

| NOTE | The functions of the command C1 are identical to the AMB OFF command . |

C2 [two]
A Minus B Into A

Syntax
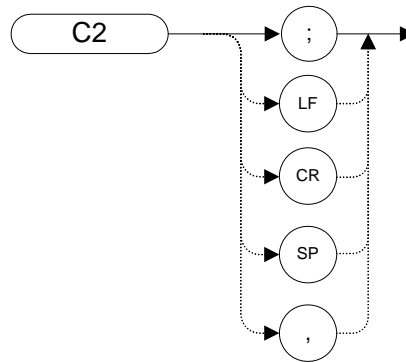
Legacy Products

8560 series, 8566A/B, 8568A/B

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 103) or a KSc (page 188) command has been executed.

NOTE	The functions of the command C2 are identical to the AMB ON command (page 100).

CA
Couple Attenuation

Syntax
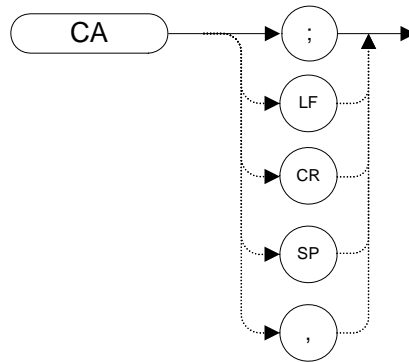
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

During normal operation, the 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 267) or the KS, command (page 179)). The counterpart to the CA command is the AT command (page 104), which allows levels less than the threshold value at the mixer input.

CARROFF
Carrier Off Power

Syntax
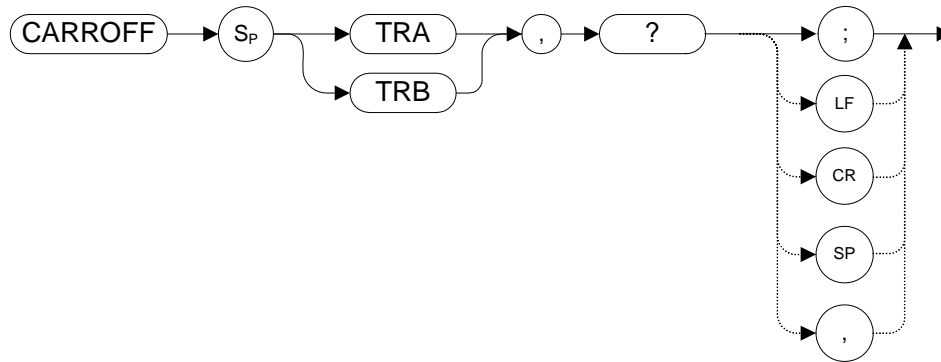
Legacy Products

8560 series

Description

Measures the average and peak power of the carrier during the portion of time when the power is off (when it is not within 20 dB of its peak level). The powers are combined to provide a calculation of the leakage power.

The measurement needs to be in zero span for the measurement to run.

CARRON
Carrier On Power

Syntax
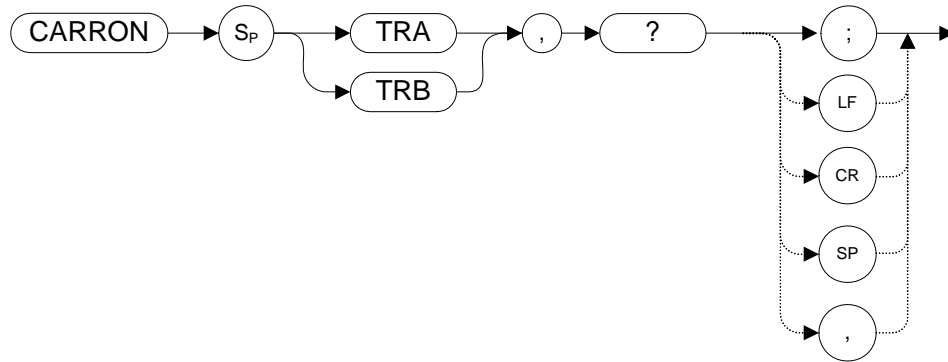
Legacy Products

8560 series

Description

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

The measurement needs to be in zero span for the measurement to run.

CF
Center Frequency

Syntax
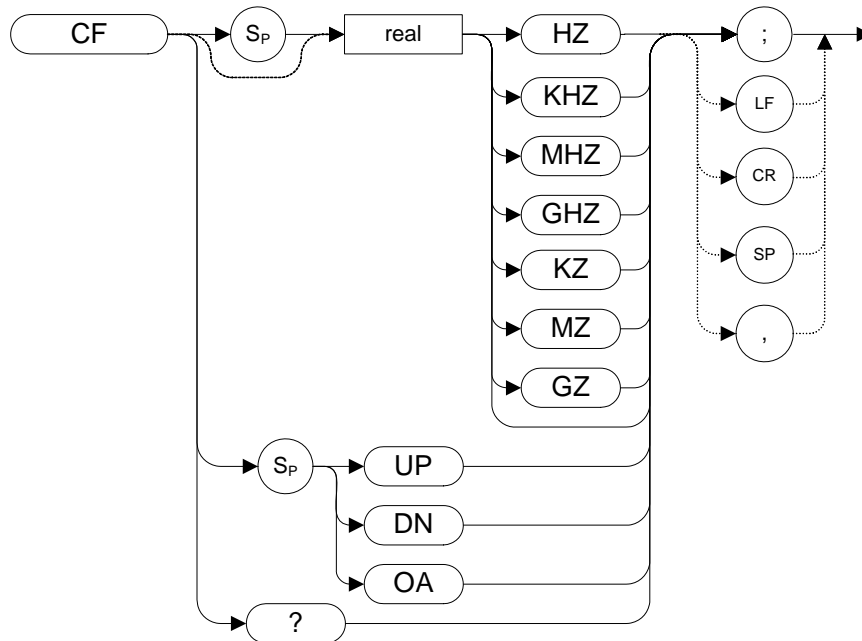
Table 4-3

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

Legacy Products

8560 series, 8566A/B, 8568A/B

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 135). 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 317).

NOTE	Although the analyzer allows entry of frequencies not in the specified frequency range, using frequencies outside the frequency span of the analyzer is not

recommended and is not warranted to meet specifications.

CHANNEL
Channel Selection

Syntax
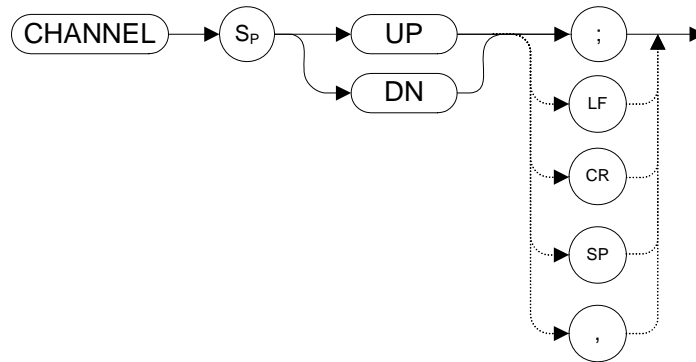
Legacy Products

8560 series

Description

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

NOTE	The channel spacing value is set using the ACPSP command (page 96).

CHANPWR
Channel Power

Syntax
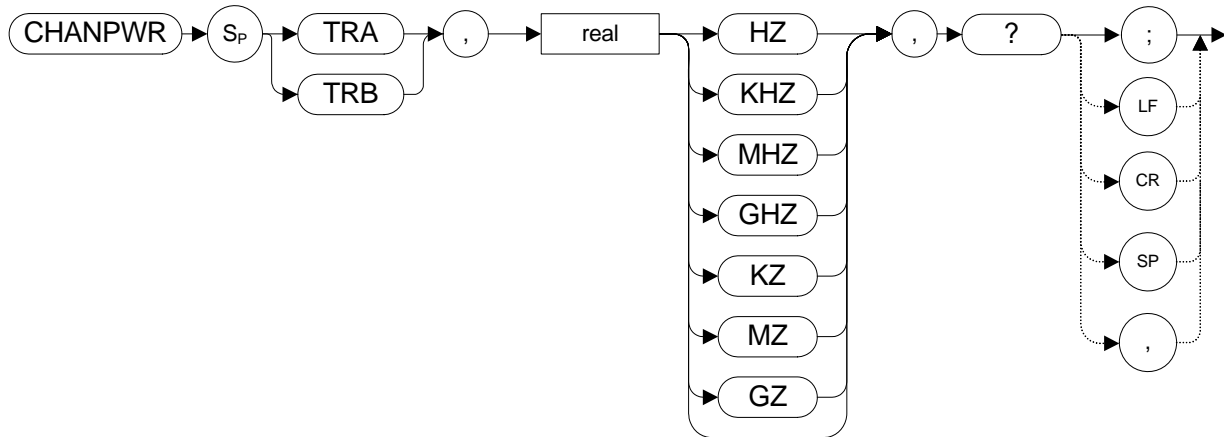
Legacy Products

8560 series

Description

Measures the power within the specified channel bandwidth.

CHPWRBW
Channel Power Bandwidth
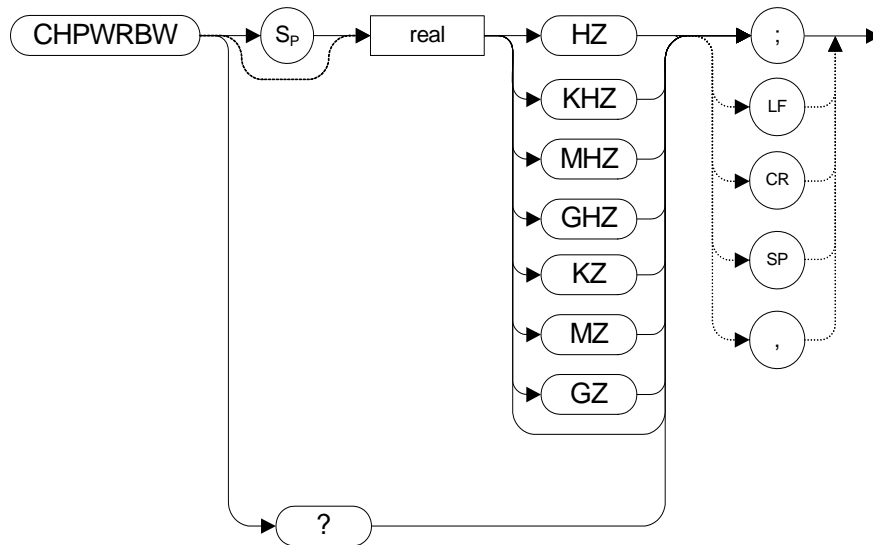
Syntax

Legacy Products

8560 series

Description

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

CLRAVG
Clear Average

Syntax

CLRAVG ──→ ;

Legacy Products

8566A/B, 8568A/B

Description

The CLRAVG 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

Syntax
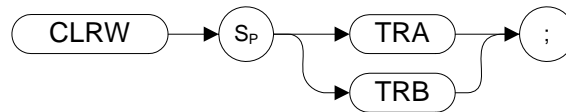
Preset State: CLRW TRA

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Clears the specified trace and enables trace data acquisition. The CLRW command places the indicated trace in clear-write mode. Data acquisition begins at the next sweep. (See the TS command (page 344) for more information about data acquisition.)

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

NOTE	The functions of the command CLRW are identical to the A1 command (page 79) and B1 command (page 110).

On the 8560 series, 8566A/B, and 8568A/B analyzers the trace settings are set by the trace mode parameters, CLRW, VIEW, BLANK, MINH and MAXH and the averaging settings by VAVG. On the X-series the same settings are set in the Trace/Detector and View/Blank parameters. The following table describes what the N9061A application sets in the X-series box when the legacy commands for trace mode and averaging are sent.

Table 4-4   **Legacy Products command mapping to X-series for trace/detector settings**

Legacy Products			X-series		
Trace commands	Averaging (VAVG)	Detector (DET)	Trace/Detector Trace Type	View/Blank	Detector
CLRW	Off	Normal	ClearWrite	On	Last set
CLRW	On	Sample	Trace Average	On	Sample
MXMH	Off	Peak	Max Hold	On	Peak
MXMH	On	Sample	Trace Average	On	Peak
MINH	Off	NegPeak	Min Hold	On	NegPeak
MINH	On	Sample	Trace Average	On	NegPeak
VIEW	Off	Normal	No change	View	No change
VIEW	On	Sample	Trace Average	View	Sample
BLANK	Off	Normal	No change	Blank	No change
BLANK	On	Sample	Trace Average	Blank	Sample

For example if the 8560 series sends CLRW and the averaging is set to ON, the 8560 series analyzer detector is automatically set to Sample. The N9061A application sets the X-series instrument trace type to Trace Average, View/Blank to On and the Detector to Sample.

CONTS
Continuous Sweep

Syntax
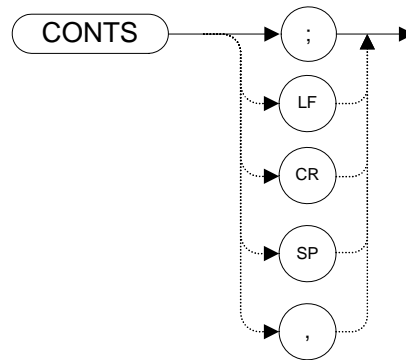
Preset State: CONTS

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The CONTS command sets the analyzer to continuous sweep mode. In the continuous sweep mode, the 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 306).

COUPLE
Input Coupling

Syntax
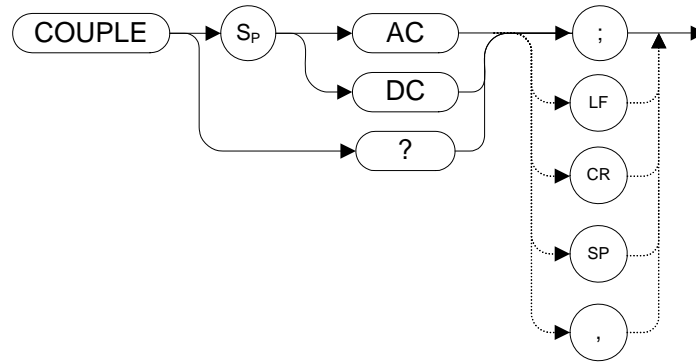
Legacy Products

8560 series

Description

The COUPLE command selects AC or DC coupling.

NOTE	When using the X-series analyzers, you must use DC coupling to see calibrated frequencies of less than 20 MHz. Signals of less than 20 MHz are not calibrated when using AC coupling on these analyzers.

CR
Couple Resolution Bandwidth

Syntax
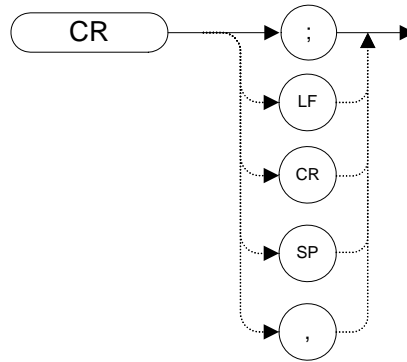
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The CR command couples the resolution bandwidth to the span.

The counterpart to the CR command is the RB command (page 295) which breaks the coupling. Use the CR command to re-establish coupling after executing an RB command.

NOTE	CR uses the legacy instrument settings for resolution bandwidth only if Mode Setup > Preferences> Limit RBW/VBW is set to ON.

CS
Couple Frequency Step Size

Syntax
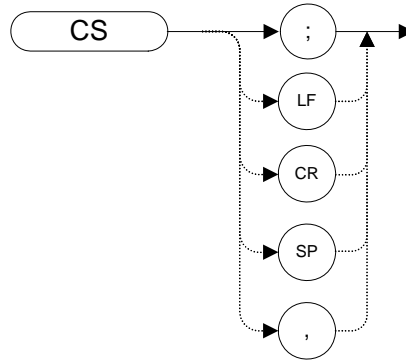
Legacy Products

8566A/B, 8568A/B

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 317) which breaks the coupling. Use the CS command to re-establish coupling after an SS command has been executed.

CT
Couple Sweep Time

Syntax
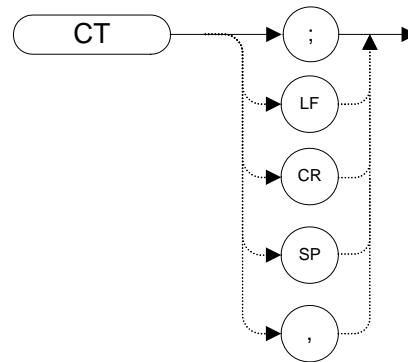
Legacy Products

8566A/B, 8568A/B

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 318) which breaks the coupling. Use the CT command to re-establish coupling after an ST command has been executed.

CV
Couple Video Bandwidth

Syntax
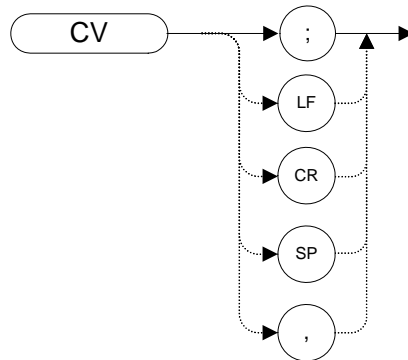
Legacy Products

8566A/B, 8568A/B

Description

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

The counterpart to the CV command is the VB command (page 347) which breaks the coupling. Use the CV command to re-establish coupling after executing a VB command.

| NOTE | CV uses the legacy signal analyzer settings for video bandwidth only if Mode Setup > Preferences> Limit RBW/VBW is set to ON. |

DA
Display Address

Syntax

DA → S_P → number → ;
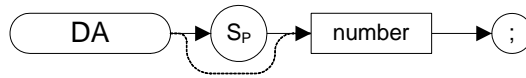
Legacy Products

8566A/B, 8568A/B

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 338), TRB? (page 339), TRC? (page 340), TA (page 330) and TB (page 331). |

DELMKBW
Occupied Power Bandwidth Within Delta Marker

Syntax
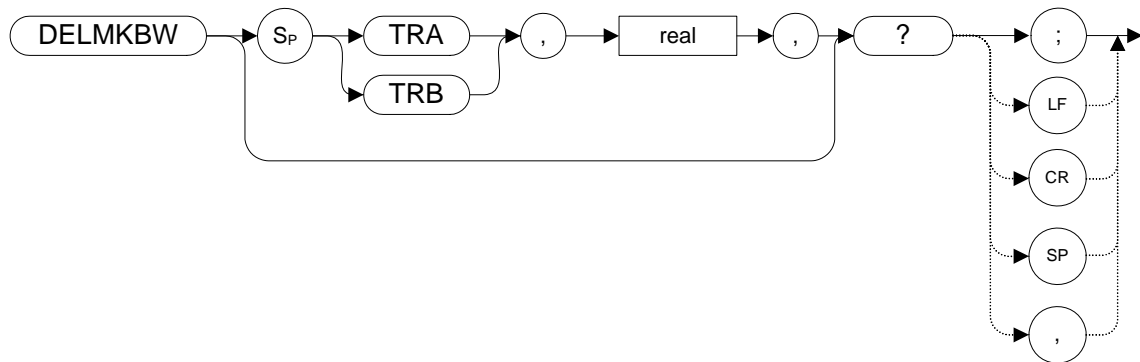
Legacy Products

8560 series

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 290) command.

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
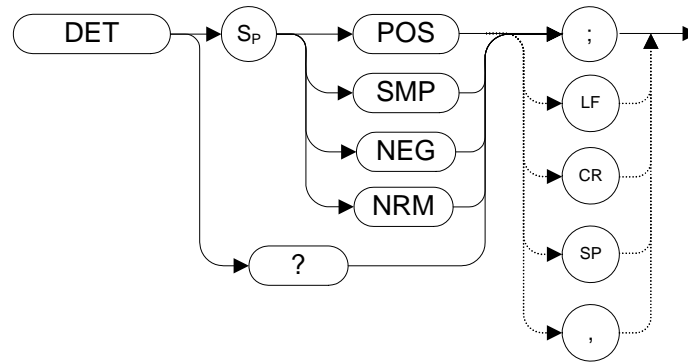
Preset State: DET NRM

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The DET command selects the type of 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.

NRM   enables the **'rosenfell'** detection algorithm that selectively chooses between positive and negative values.

NOTE	The functions of the DET command are identical to the KSa command (page 184), the KSb command (page 186), the KSd command (page 190), and the KSe command (page 192).

DL
Display Line

Syntax

8560 series:

```
  DL ──► Sᴘ ──► number ──► DB ─────────► ; ──►
         Sᴘ ──► UP          DBM          LF
               ──► DN        DBMV        CR
               ──► OFF       DBUV        SP
               ──► ON        MV          ,
                             UV
                             V
                             MW
                             UW
                             W
                             DM
              ──► ?
```

8566A/B, 8568A/B:

```
  DL ──► Sᴘ ──► number ──► ;
               ──► UP
               ──► DN
               ──► OA
               ──► ?
```
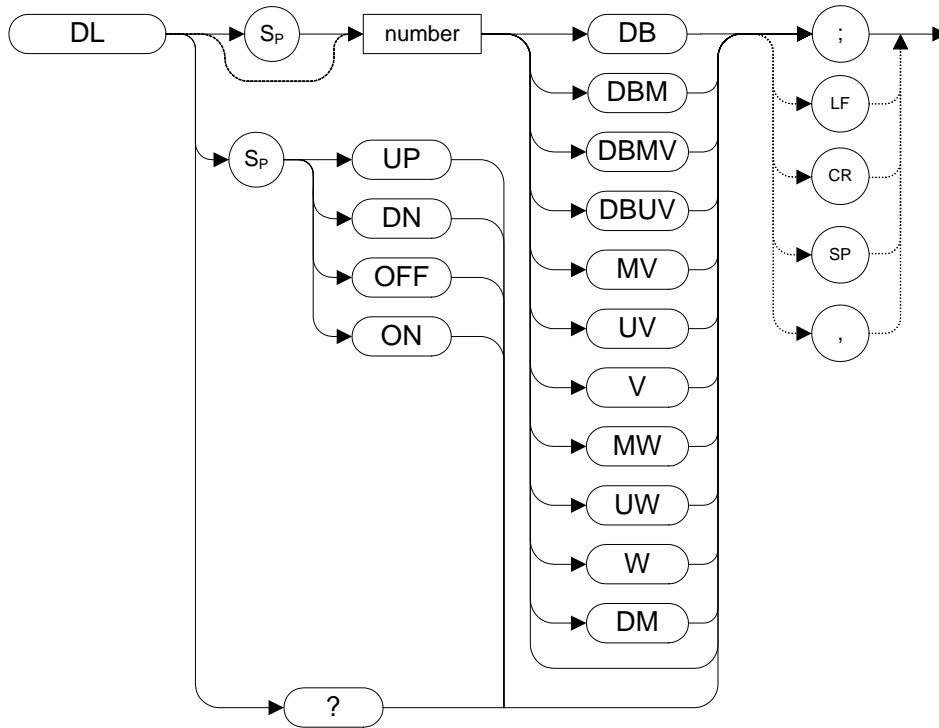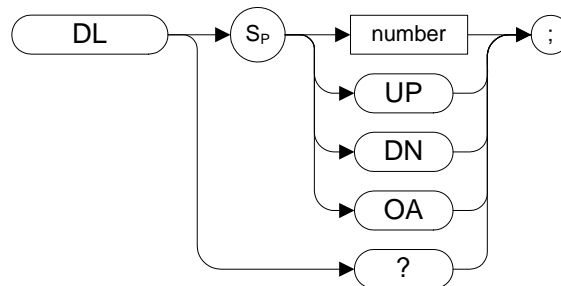
Table 4-5

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

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

DLE
Display Line Enable

Syntax

```
DLE → SP → ON  → ;
           OFF
           ?
```
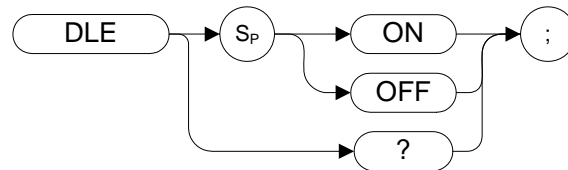
Legacy Products

8566A/B, 8568A/B

Description

Enables or disables the display line.

DLYSWP
Delay Sweep

Syntax
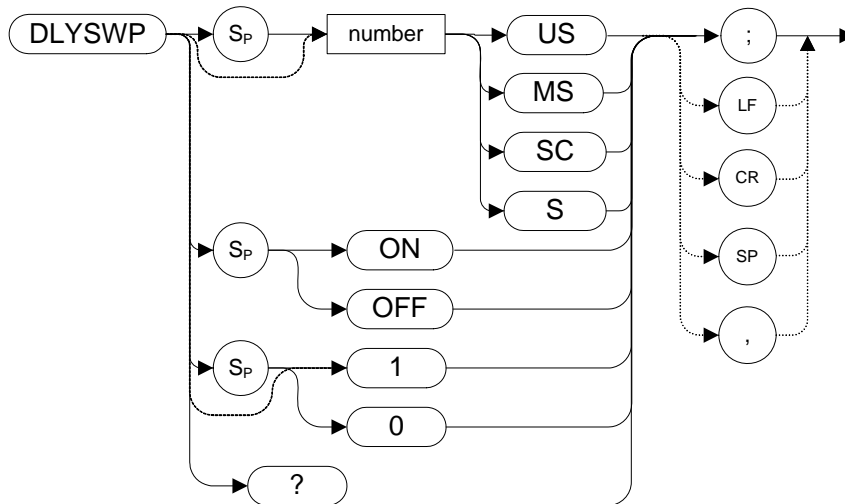
Legacy Products

8560 series

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.

DONE
Done

Syntax
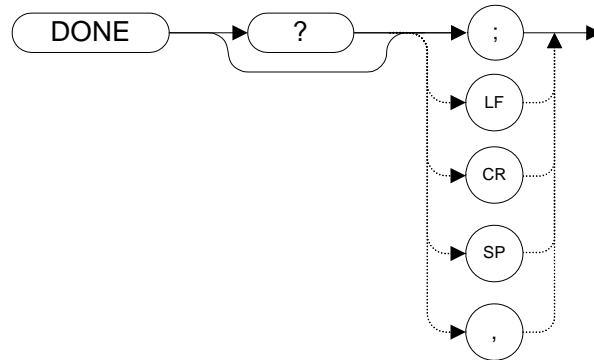
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Allows you to determine when the analyzer has parsed a list of 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 344)) precedes the command list, the TS command acts as a synchronizing function since the command list execution begins after the sweep has been completed.

DR
Display Read

Syntax

DR ⟶ ;

Legacy Products

8566A/B, 8568A/B

Description

The DR command sends the contents of the current display address to the controller.

E1[one]
Peak Marker

Syntax
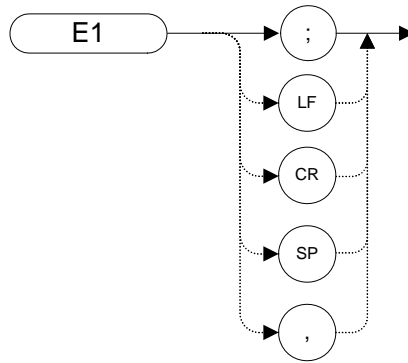
Legacy Products

8560 series, 8566A/B, 8568A/B

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 255).

E2 [two]
Marker to Center Frequency

Syntax
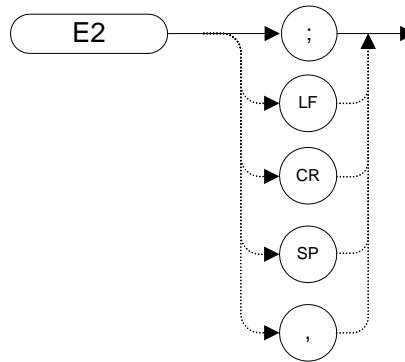
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

NOTE	Unlike MKCF (page 244), which moves the CF to the current position of the active marker, the function of E2 centers the active marker to the center frequency on the analyzer screen.

E3 [three]
Delta Marker Step Size

Syntax
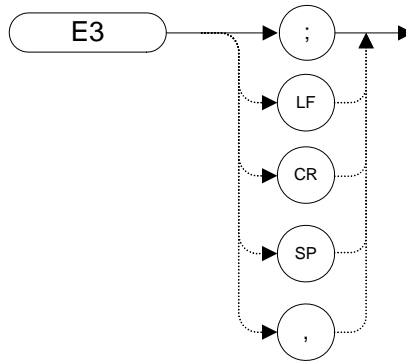
Legacy Products

8560 series, 8566A/B, 8568A/B

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 262).

E4 [four]
Marker to Reference Level

Syntax
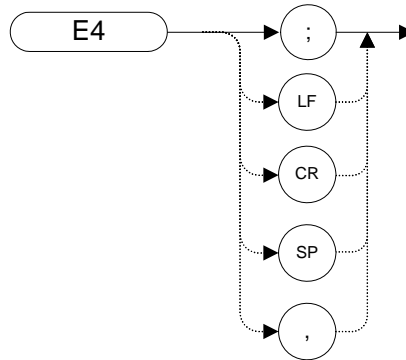
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

NOTE	Unlike MKRL (page 260), which moves to the level of the delta Marker when in delta Maker mode.

EDITDONE
Edit Done

Syntax
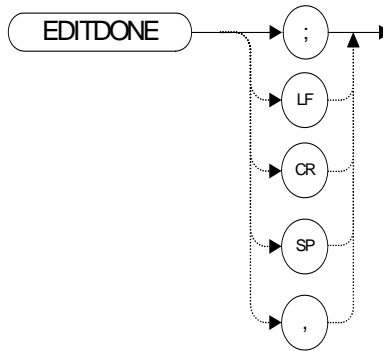
Legacy Products

8560 series

Description

This command is used at the completion of limit-line editing within the EDITLIML command.

During the limit line commands beginning with EDITLIML and ending with EDITDONE, you can enter the limit line data.

ERR
Error

Syntax
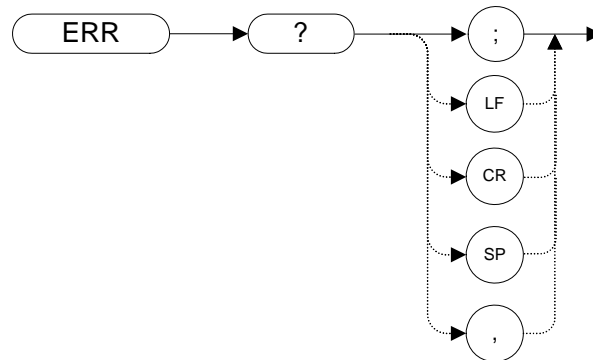
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The ERR command returns a list of three-digit error codes if errors are present. A code of "0" means that there are no errors present. Executing ERR? clears all GPIB errors.

If a command is a valid legacy command but not accepted by the N9061A application, no error message is generated and the response to ERR? is 0. However, if logging is enabled, the N9061A application command log registers a "Cmd not Supported" error.

If a command is not a valid legacy command, a command error is generated; CMD ERR is displayed on the front panel and the response to ERR? is 112. If logging is enabled then Cmd Error is written to the command error log.

Table 4-6

Error Code	Description
112	CMD ERR

Error codes are provided in RLC mode for some X-series errors such as external reference, hardware and alignment errors. The X-series error codes are translated to 8560 series error codes so that an error query returns the legacy instrument error code. To review the error via the front panel, select the **System** hardkey and then select **Show > Errors**. The following table shows the X-series error codes and the translated value.

Table 4-7

X-series error code	Description	8560 series error code	Description
40	TG Alignment Failure	758	SYSTEM: Unknown system error
42	RF Alignment Failure	758	SYSTEM: Unknown system error
44	IF Alignment Failure	758	SYSTEM: Unknown system error
46	LO Alignment Failure	758	SYSTEM: Unknown system error
48	ADC Alignment Failure	758	SYSTEM: Unknown system error
50	FM Demod Alignment Failure	758	SYSTEM: Unknown system error
54	Extended Align Failure Sum	758	SYSTEM: Unknown system error
71	Characterize Preselector Failure	758	SYSTEM: Unknown system error
-200.3310	Execution Error; Preselector Centering failed	758	SYSTEM: Unknown system error
503	Frequency Reference Unlocked	336	10 MHz Ref Cal oscillator failed to lock when going to internal 10 MHz reference.
505	2nd LO Unlocked	336	10 MHz Ref Cal oscillator failed to lock when going to internal 10 MHz reference.
509	LO Unlocked	300	YTO UNL: YTO (1st LO) phase-locked loop (PLL) is unlocked.
513	IF Synthesizer Unlocked	450	IF SYSTM: IF hardware failure. Check other error messages.
515	Calibration Oscillator Unlocked	336	10 MHz Ref: Cal oscillator failed to lock when going to internal 10 MHz reference
521	External Ref missing or out of range	905,333	EXT REF: Unable to lock cal oscillator when set to external reference. Check that the external reference is within tolerance. 600 UNLK: 600 MHz reference oscillator PLL is unlocked

ET
Elapsed Time

Syntax
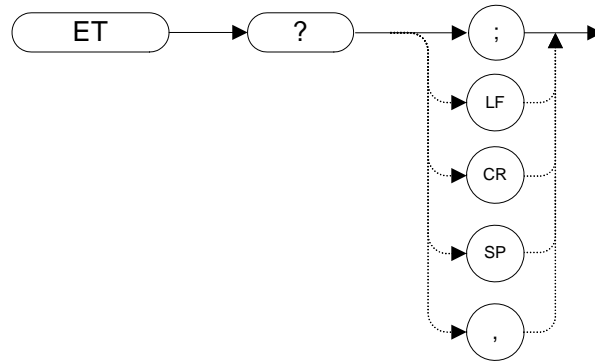
Legacy Products

8560 series

Description

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

EX
Exchange Trace A and Trace B
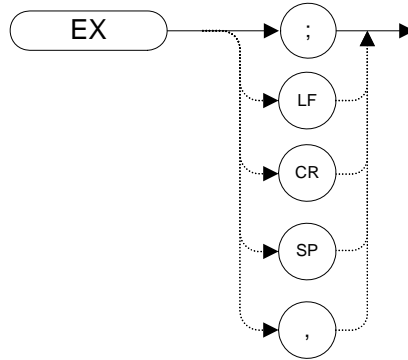
Syntax

Legacy Products

8560 series, 8566A/B, 8568A/B

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 109)and to the XCH TRA,TRB command (page 354).

FA
Start Frequency

Syntax
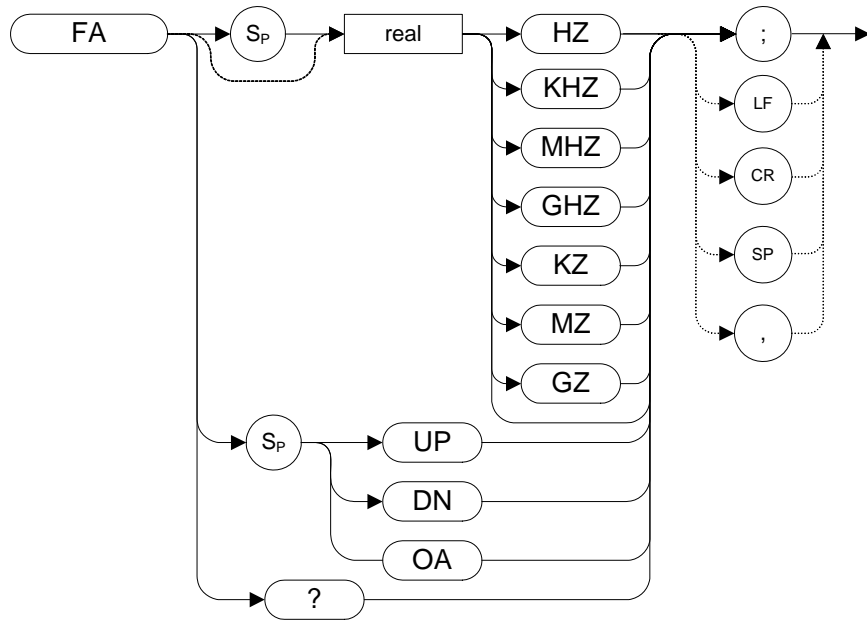
Table 4-8

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

Step Increment: Frequency span divided by 10

Legacy Products

8560 series, 8566A/B, 8568A/B

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
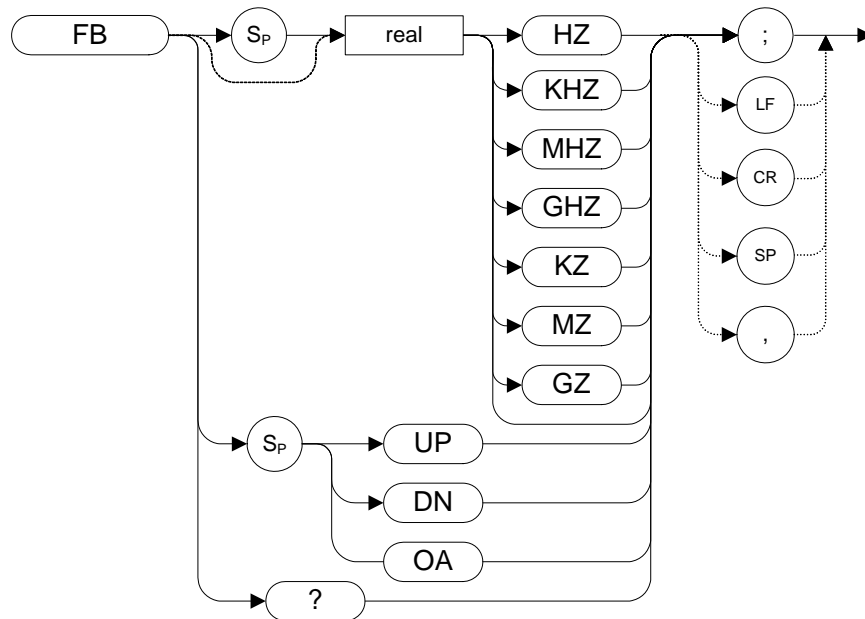
Table 4-9

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

Step Increment: Frequency span divided by 10

Legacy Products

8560 series, 8566A/B, 8568A/B

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
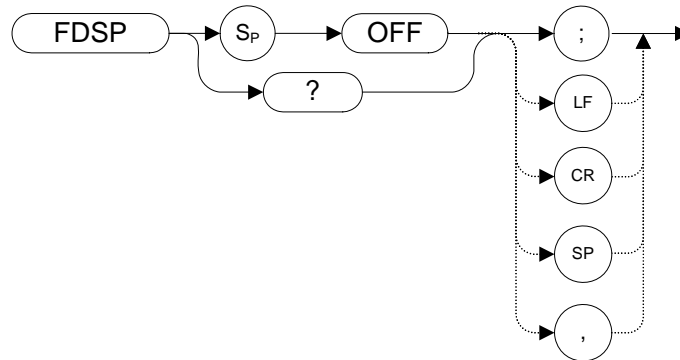
Legacy Products

8560 series

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 102) If the FDSP command has been used to disable the frequency annotation, sending the ANNOT ON command does not re-enable the display annotation. The display annotation is only displayed by sending the IP (page 178) command.

FOFFSET
Frequency Offset

Syntax
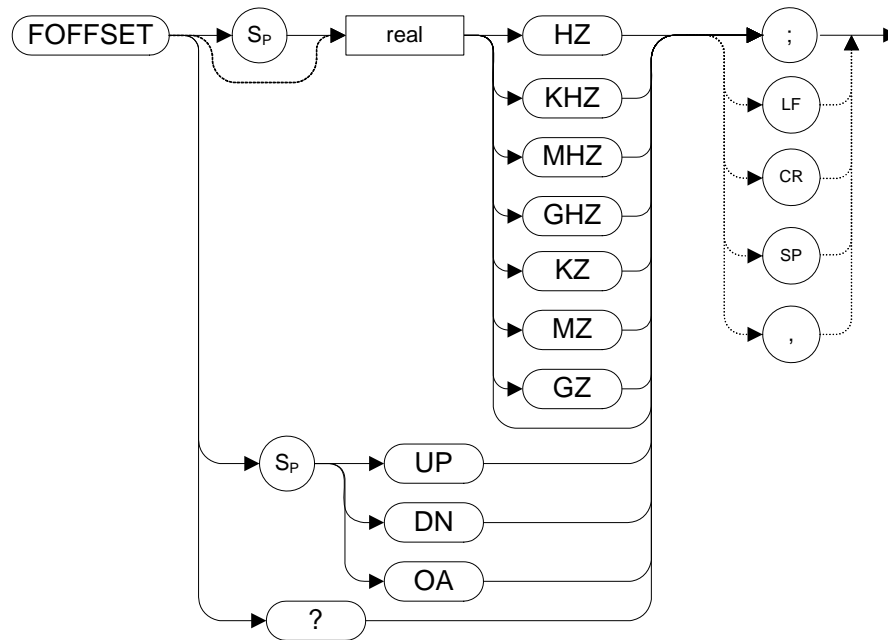
Table 4-10

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

Preset State: 0 Hz

Legacy Products

8560 series, 8566A/B, 8568A/B

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 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 211).

FPKA
Fast Preselector Peak

Syntax
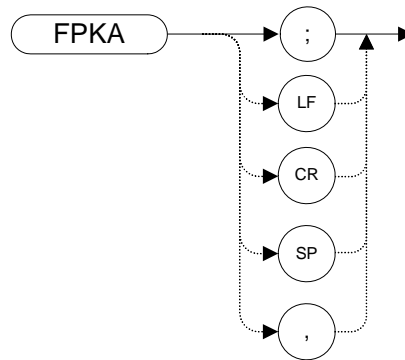
Legacy Products

8566A/B

Description

The FPKA command automatically adjusts the preselector frequency to yield the greatest signal level at the active marker. The FPKA command peaks the preselector faster than the preselector-peak command, PP Although this command can be executed in all frequency spans, it performs best when the instrument is in zero span. Use the standard preselector peak for all other frequency spans. The FPKA command also returns the amplitude value of active marker.

FREF
Frequency Reference

Syntax
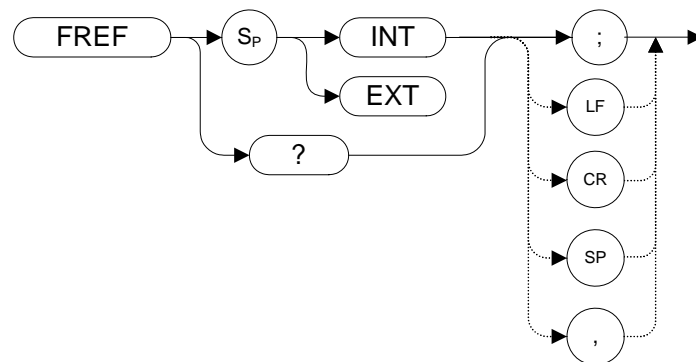
Legacy Products

8560 series

Description

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

FS
Full Span

Syntax
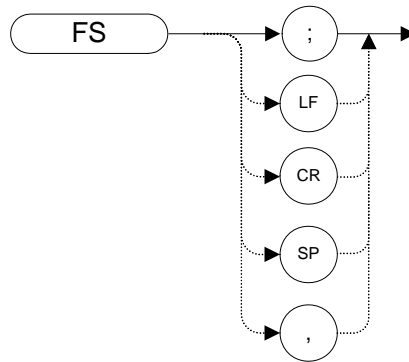
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

8560 series: The FS command sets the frequency span of the analyzer to full span. Resolution bandwidth, video bandwidth, and sweep time are all set to auto-coupled.

8566A/B, 8568A/B: The FS command does an instrument preset, then sets the low band.

NOTE	The functions of the FS command are identical to the LF command (page 216).

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

Table 4-11   PXA Series - Frequency Ranges Set by the FS Command

	N9030A-503	N9030A-508	N9030A-513	N9030A-526
Remote Language	Frequency Range	Frequency Range	Frequency Range	Frequency Range
8560E/EC	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz
8561E/EC	0 Hz - 3.6 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz
8562E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.2 GHz	0 Hz - 13.2 GHz
8563E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8564E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8565E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8566A	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
8568A	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

Table 4-12   MXA Series - Frequency Ranges Set by the FS Command

	N9020A-503	N9020A-508	N9020A-513	N9020A-526
Remote Language	Frequency Range	Frequency Range	Frequency Range	Frequency Range
8560E/EC	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz
8561E/EC	0 Hz - 3.6 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz
8562E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.2 GHz	0 Hz - 13.2 GHz
8563E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8564E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8565E/EC	0 Hz - 3.6 GHz	0 Hz - 8.4 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8566A	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
8568A	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

Table 4-13 **EXA Series - Frequency Ranges Set by the FS Command**

	N9010A-503	N9010A-507	N9010A-513	N9010A-526
Remote Language	**Frequency Range**	**Frequency Range**	**Frequency Range**	**Frequency Range**
8560E/EC	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz	0 Hz - 2.9 GHz
8561E/EC	0 Hz - 3.6 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz	0 Hz - 6.5 GHz
8562E/EC	0 Hz - 3.6 GHz	0 Hz - 7.0 GHz	0 Hz - 13.2 GHz	0 Hz - 13.2 GHz
8563E/EC	0 Hz - 3.6 GHz	0 Hz - 7.0 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8564E/EC	0 Hz - 3.6 GHz	0 Hz - 7.0 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8565E/EC	0 Hz - 3.6 GHz	0 Hz - 7.0 GHz	0 Hz - 13.6 GHz	0 Hz - 27.0 GHz
8566A	0 Hz - 1.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz	0 Hz - 2.5 GHz
8566B	0 Hz - 1.5 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
8568B	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz	0 Hz - 1.5 GHz

GATE
Gate

Syntax
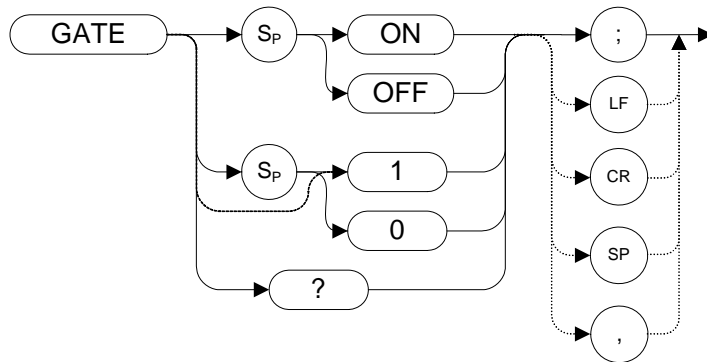
Preset State: GATE OFF

Legacy Products

8560 series

Description

Turns the time-gating function on or off. When the time-gating function is turned on, the analyzer activates the time gate circuitry according to the parameters controlled by gate length (GL), gate delay (GD) and the gate trigger input.

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

8560 Series   Query response is either 1 or 0, indicating ON or OFF state.

GATECTL
Gate Control

Syntax
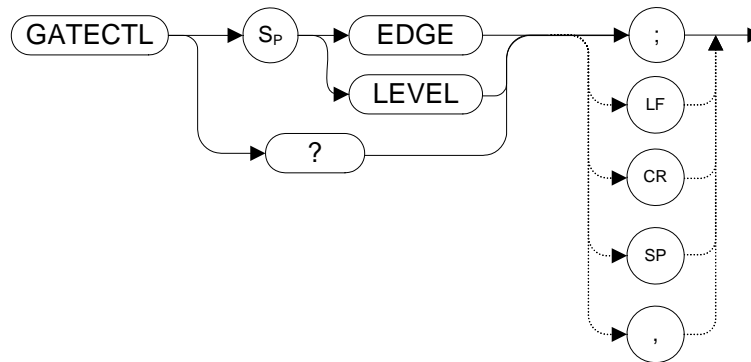
Preset State: GATECTL EDGE

Legacy Products

8560 series

Description

Selects between the edge and level mode for time gate function. In the edge mode, a specified trigger edge starts the gate delay timer that in turn starts the gate length timer. In the level mode, the gate follows the trigger input level. The gate delay timer (GD) and the gate time length (GL) are operational in the edge mode, but not in the level mode.

GD
Gate Delay

Syntax
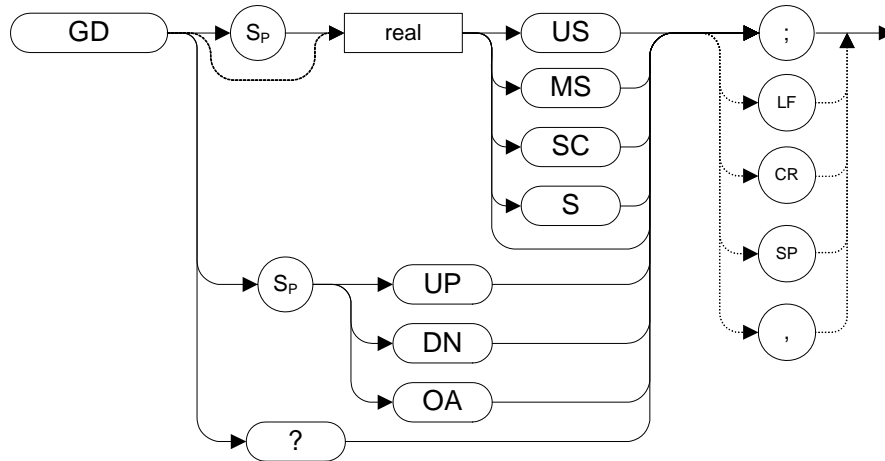
Preset State: 3 µs

Legacy Products

8560 series

Description

Sets the delay time from when the gate trigger occurs to when the gate is turned on. GD only applies if GATECTL is set to EDGE.

GL
Gate Length

Syntax
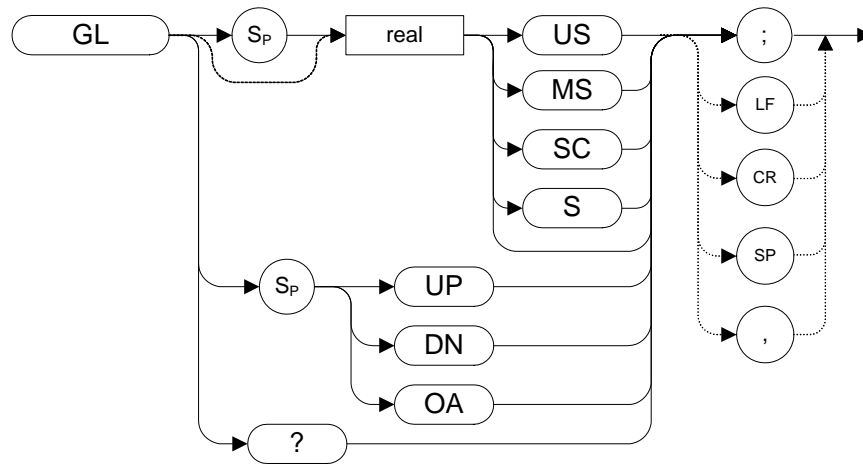
Preset State: 1 μs

Legacy Products

8560 series

Description

Sets the length of time the time gate is turned on. GL only applies if GATECTL is set to EDGE.

GP
Gate Polarity

Syntax
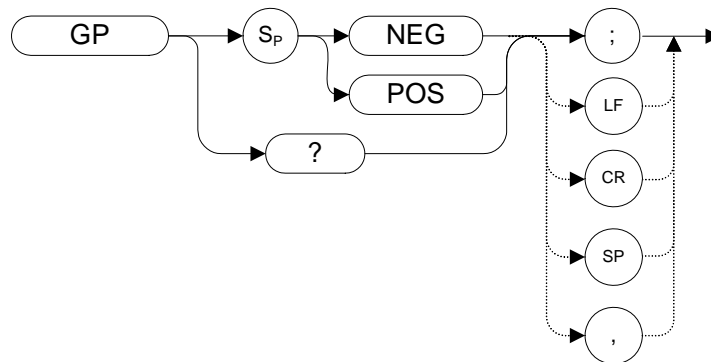
Preset State: GP POS

Legacy Products

8560 series

Description

Sets the polarity (positive or negative) for the gate trigger. If the gate control (GATECTL) is in the edge mode, the gate delay timer can be triggered on either a positive or negative edge of the trigger input. If the gate control is in level mode and positive is selected, the gate is on when the trigger input is high. If the gate control is in level mode and negative is selected, the gate is on when the trigger is low.

GRAT
Graticule

Syntax
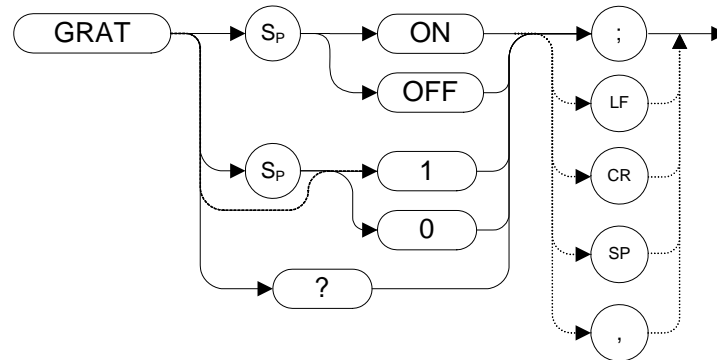
Preset State: GRAT ON

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Turns the graticule on or off.

NOTE	The functions of the GRAT command are identical to the KSm command (page 204) and the KSn command (page 206).

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

8560 Series	For Phoenix2 cut sentence above and paste here
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.

HD
Hold Data Entry

Syntax

```
HD ──────┬──→( ; )──────┐──→
         ├──→( LF )······┤
         ├──→( CR )······┤
         ├──→( SP )······┤
         └──→( , )───────┘
```
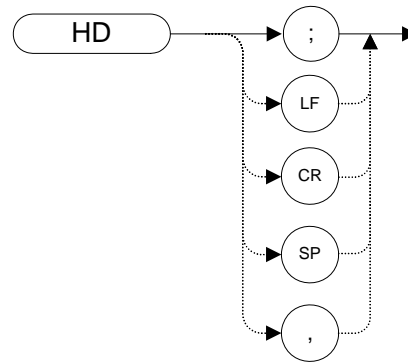
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

I1 [one]
Set RF Coupling to DC

Syntax
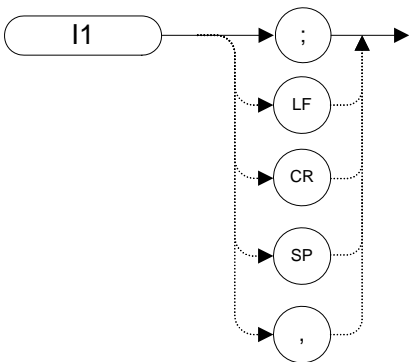
Legacy Products

8568A/B

Description

The I1 **[one]** command sets the RF coupling to DC.

The tables below list the frequency specifications for all X-Series analyzers for both DC and AC coupling.

Table 4-14   **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 4-15   **EXA Series Analyzer Frequency Coupling Specifications**

	DC Coupled Range		AC Coupled Range	
Analyzer Model (N9010A)	**Min. Freq.**	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
Option 503	9 kHz	3.6 GHz	10 MHz	3.6 GHz
Option 507	9 kHz	7.0 GHz	10 MHz	7.0 GHz
Option 513	9 kHz	13.6 GHz	10 MHz	13.6 GHz

Table 4-15   **EXA Series Analyzer Frequency Coupling Specifications**

Analyzer Model (N9010A)	DC Coupled Range		AC Coupled Range	
	Min. Freq.	Max. Freq.	Min. Freq.	Max. Freq.
Option 526	9 kHz	26.5 GHz	10 MHz	26.5 GHz

Table 4-16   **MXA Series Analyzer Frequency Coupling Specifications**

Analyzer Model (N9020A)	DC Coupled Range		AC Coupled Range	
	Min. Freq.	Max. Freq.	Min. Freq.	Max. Freq.
Option 503	20 Hz	3.6 GHz	10 MHz	3.6 GHz
Option 508	20 Hz	8.4 GHz	10 MHz	8.4 GHz
Option 513	20 Hz	13.6 GHz	10 MHz	13.6 GHz
Option 526	20 Hz	26.5 GHz	10 MHz	26.5 GHz

Table 4-17   **PXA Series Analyzer Frequency Coupling Specifications**

Analyzer Model (N9030A)	DC Coupled Range		AC Coupled Range	
	Min. Freq.	Max. Freq.	Min. Freq.	Max. Freq.
Option 503	3 Hz	3.6 GHz	10 MHz	3.6 GHz
Option 508	3 Hz	8.4 GHz	10 MHz	8.4 GHz
Option 513	3 Hz	13.6 GHz	10 MHz	13.6 GHz
Option 526	3 Hz	26.5 GHz	10 MHz	26.5 GHz

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

I2 [two]
Set RF Coupling to AC

Syntax
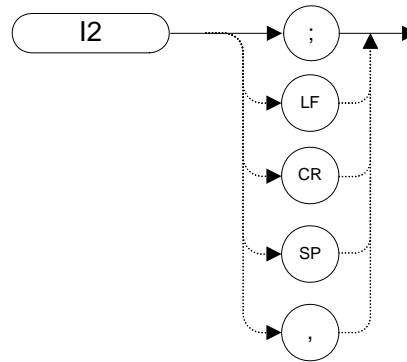
Legacy Products

8568A/B

Description

The I2 **[two]** command sets the RF coupling to AC.

The tables below list the frequency specifications for all X-Series analyzers for both DC and AC coupling.

Table 4-18   **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 4-19   **EXA Series Analyzer Frequency Coupling Specifications**

	DC Coupled Range		AC Coupled Range	
Analyzer Model (N9010A)	**Min. Freq.**	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
Option 503	9 kHz	3.6 GHz	10 MHz	3.6 GHz
Option 507	9 kHz	7.0 GHz	10 MHz	7.0 GHz
Option 513	9 kHz	13.6 GHz	10 MHz	13.6 GHz

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Table 4-19   **EXA Series Analyzer Frequency Coupling Specifications**

Analyzer Model (N9010A)	DC Coupled Range		AC Coupled Range	
	Min. Freq.	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
Option 526	9 kHz	26.5 GHz	10 MHz	26.5 GHz

Table 4-20   **MXA Series Analyzer Frequency Coupling Specifications**

Analyzer Model (N9020A)	DC Coupled Range		AC Coupled Range	
	Min. Freq.	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
Option 503	20 Hz	3.6 GHz	10 MHz	3.6 GHz
Option 508	20 Hz	8.4 GHz	10 MHz	8.4 GHz
Option 513	20 Hz	13.6 GHz	10 MHz	13.6 GHz
Option 526	20 Hz	26.5 GHz	10 MHz	26.5 GHz

Table 4-21   **PXA Series Analyzer Frequency Coupling Specifications**

Analyzer Model (N9030A)	DC Coupled Range		AC Coupled Range	
	Min. Freq.	**Max. Freq.**	**Min. Freq.**	**Max. Freq.**
Option 503	3 Hz	3.6 GHz	10 MHz	3.6 GHz
Option 508	3 Hz	8.4 GHz	10 MHz	8.4 GHz
Option 513	3 Hz	13.6 GHz	10 MHz	13.6 GHz
Option 526	3 Hz	26.5 GHz	10 MHz	26.5 GHz

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

ID
Identify

Syntax
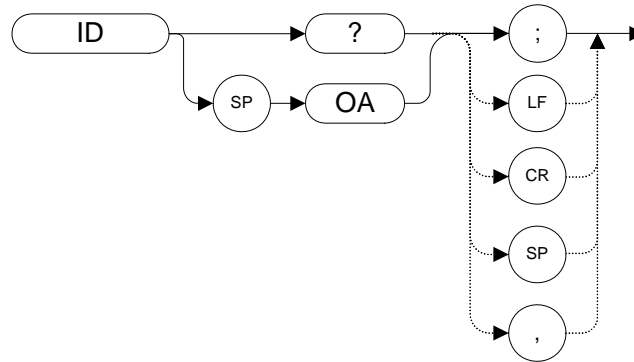
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The ID command returns the current remote language to the controller (for example, "HP8563E").

The response value is determined by your remote language selection. This is configured via the front-panel menu selection in Mode Setup when in RLC mode. The remote language selection can also be set using the SCPI command SYSTem:LANGuage.

ID? also works when you are not in RLC mode. In this case the instrument model number is returned. The string that is returned is identical to the second field of text that is returned from the *IDN? command.

For more information see:

"Setting up N9061A on the X-Series Analyzer" on page 27

"Running Software that Requires SCPI Commands" on page 38

IP
Instrument Preset

Syntax
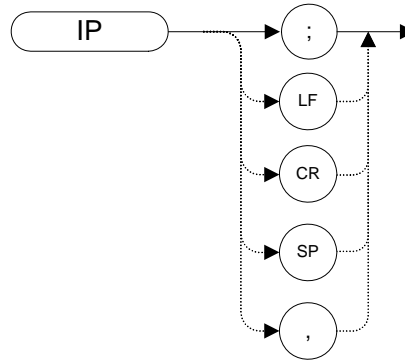
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Performs an instrument preset, setting the analyzer back to its factory settings. IP does not affect the contents of any data or trace registers or stored preselector data. IP does not clear the input or output data buffers on the 8560-series analyzers, but does clear them on the 8566A/B, 8568A/B.

Instrument preset automatically occurs when you turn on the analyzer. IP is a good starting point for many measurement processes. When IP is executed remotely, the 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.

The N9061A application executes this command after any language switch on the X-Series analyzer.

NOTE	The functions of the IP command are identical to the KST command .

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

KS, Mixer Level

Syntax
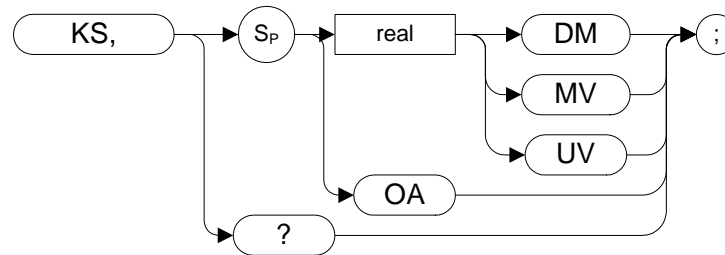
Legacy Products

8566A/B, 8568A/B

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 267).

KS=
8566A/B: Automatic Preselector Tracking
8568A/B: Marker Counter Resolution

Syntax
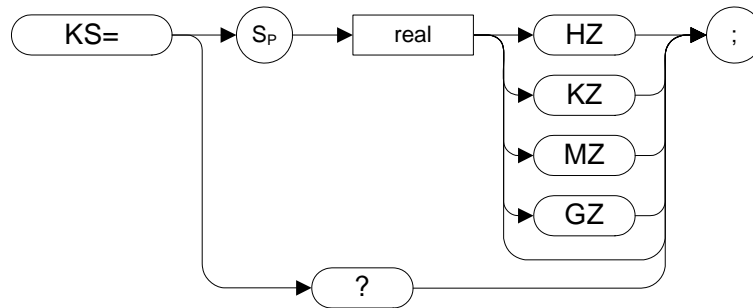
Legacy Products

8566A/B, 8568A/B

Description

8566A/B: Use the KS= command to reinstate automatic preselector tracking after KS/ has been executed. Normally, the center of the preselector filter automatically tracks signal responses in the four frequency bands of the 2 to 22 GHz range.

The KS/ command allows manual adjustment of the preselector tracking and the X-Series analyzers can swallow this command with no action.

8568A/B: Specifies the resolution of the marker frequency counter.

NOTE	For 8568A/B, the functions of the KS= command are identical to the MKFCR command (page 248).

KS(
Lock Registers

Syntax

$$\text{KS(} \longrightarrow \text{;}$$

Legacy Products

8566A/B, 8568A/B

Description

The KS(command secures the contents of registers one through six. When the registers are secured, the SV and SAVE commands cannot save more instrument states in the registers, but instead write "SAVE LOCK" on the analyzer display. To save an instrument state in a locked register, first execute KS) to unlock the registers.

The recall function of the analyzer is not affected by this function.

KS)
Unlock Registers

Syntax

$$\text{KS)} \longrightarrow \text{;}$$
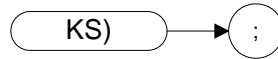
Legacy Products

8566A/B, 8568A/B

Description

The KS) command unlocks the registers where instrument states are stored with SV and SAVE commands.

KSA
Amplitude in dBm

Syntax

$$\boxed{\text{KSA}} \longrightarrow \bigcirc\text{;}$$

Legacy Products

8566A/B, 8568A/B

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 106).

KSa
Normal Detection

Syntax

$$\boxed{\text{KSa}} \longrightarrow \boxed{;}$$

Legacy Products

8566A/B, 8568A/B

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 140).

KSB
Amplitude in dBmV

Syntax

$$\boxed{\text{KSB}} \longrightarrow (\; ; \;)$$

Legacy Products

8566A/B, 8568A/B

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 .

KSb
Positive Peak Detection

Syntax

$$\boxed{\text{KSb}} \longrightarrow \bigcirc\!;$$

Legacy Products

8566A/B, 8568A/B

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 140).

KSC
Amplitude in dBuV

Syntax

$$\boxed{\text{KSC}} \longrightarrow (\ ;\ )$$

Legacy Products

8566A/B, 8568A/B

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 106).

KSc
A Plus B to A

Syntax

Legacy Products

8566A/B, 8568A/B

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 103). |

KSD
Amplitude in Volts

Syntax

$$\text{KSD} \longrightarrow ;$$
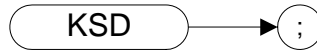
Legacy Products

8566A/B, 8568A/B

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 106).

KSd
Negative Peak Detection

Syntax

$$\boxed{KSd} \longrightarrow (\ ;\ )$$

Legacy Products

8566A/B, 8568A/B

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 140).

KSE
Title Mode

Syntax
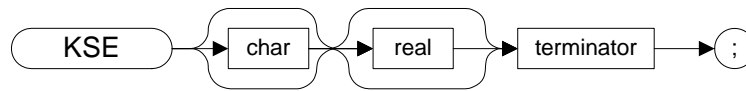
Legacy Products

8566A/B, 8568A/B

Description

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

NOTE	The only characters that the N9061A application accepts as a terminator are the '@' character and the carriage return.

KSe
Sample Detection

Syntax

$$\boxed{\text{KSe}} \longrightarrow (\ ;\ )$$
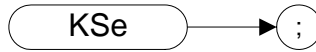
Legacy Products

8566A/B, 8568A/B

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 140).

KSG
Video Averaging On

Syntax
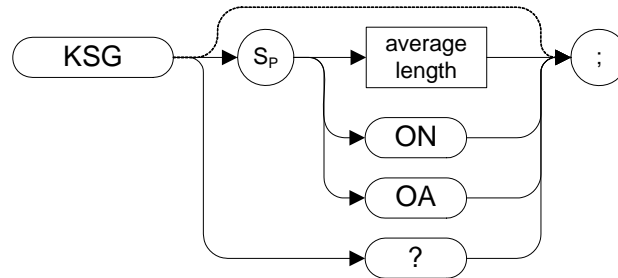
Legacy Products

8566A/B, 8568A/B

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 345).

KSg
Display Off

Syntax

$$\boxed{\text{KSg}} \longrightarrow (\ ;\ )$$

Legacy Products

8566A/B, 8568A/B

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 X-Series analyzers have a much longer life than the CRTs used in the legacy spectrum analyzers.

KSH
Video Averaging Off

Syntax

$$\boxed{\text{KSH}} \longrightarrow (\ ;\ )$$
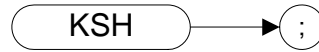
Legacy Products

8566A/B, 8568A/B

Description

The KSH command switches video averaging Off.

NOTE	The functions of the KSH command are identical to the VAVG OFF command (page 345).

KSh
Display On

Syntax

$$\boxed{\text{KSh}} \longrightarrow (\ ;\ )$$

Legacy Products

8566A/B, 8568A/B

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 X-Series analyzers have a much longer life than the CRTs used in the legacy spectrum analyzers.

KSi
Exchange Trace B and Trace C

Syntax

```
( KSi ) ⟶ ( ; )
```

Legacy Products

8566A/B, 8568A/B

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 307) or SNGLS command (page 313))

- Select the desired analyzer settings

- Take one complete sweep using the TS command (page 344)

  - Exchange the data

NOTE The functions of the command KSi are identical to the BXC command (page 118) and the XCH TRB,TRC command (page 354).

KSj
View Trace C

Syntax

$$\boxed{\text{KSj}} \longrightarrow (\ ;\ )$$

Legacy Products

8566A/B, 8568A/B

Description

The KSj command displays Trace C.

NOTE	The functions of the command KSj are identical to the VIEW TRC command (page 351).

KSK
Marker to Next Peak

Syntax

$$\text{KSK} \longrightarrow ;$$

Legacy Products

8566A/B, 8568A/B

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 255), 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 256) and the TH command (page 333). For more details on marker peak excursion, see the MKPX command (page 257).

KSk
Blank Trace C

Syntax

$$\text{KSk} \longrightarrow ;$$

Legacy Products

8566A/B, 8568A/B

Description

The KSj command blanks Trace C.

NOTE	The functions of the command KSk are identical to the BLANK TRC command (page 115))

KSL
Marker Noise Off

Syntax

KSL ⟶ ;

Legacy Products

8566A/B, 8568A/B

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 252).

KSl
Transfer Trace B to Trace C
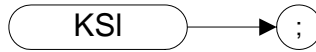
Syntax

$$\boxed{\text{KSl}} \longrightarrow \bigcirc\ ;$$

Legacy Products

8566A/B, 8568A/B

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 307) or SNGLS command (page 313))

- Select the desired analyzer settings

- Take one complete sweep using the TS command (page 344)

  - Transfer the data

NOTE The functions of the command KSl are identical to the BTC command (page 117).

KSM
Marker Noise On

Syntax
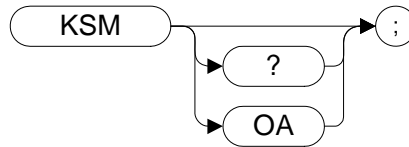
Legacy Products

8566A/B, 8568A/B

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 252).

KSm
Graticule Off

Syntax

$$\text{KSm} \longrightarrow ;$$
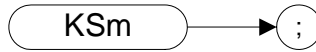
Legacy Products

8566A/B, 8568A/B

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 171).

KSN
Marker Minimum

Syntax

$$\boxed{\text{KSN}} \longrightarrow (\,;\,)$$

Legacy Products

8566A/B, 8568A/B

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 250).

KSn
Graticule On

Syntax

KSn ────► ;
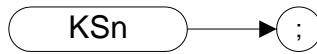
Legacy Products

8566A/B, 8568A/B

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 171).

KSO
Marker Span

Syntax

$$\boxed{\text{KSO}} \longrightarrow (\,;\,)$$

Legacy Products

8566A/B, 8568A/B

Description

The KSO command operates only when the delta marker is On (see MKD (page 245) or M3 (page 229)). 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 261).

KSo
Annotation Off

Syntax

$$\boxed{\text{KSo}} \longrightarrow \bigcirc{;}$$

Legacy Products

8566A/B, 8568A/B

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 102).

KSp
Annotation On

Syntax

$$\text{KSp} \longrightarrow \text{;}$$
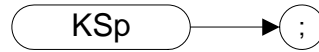
Legacy Products

8566A/B, 8568A/B

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 102).

KST
Fast Preset

Syntax

$$\text{KST} \longrightarrow ;$$

Legacy Products

8566A/B, 8568A/B

Description

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

NOTE	There is no fast preset for X-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 178).

KSV
Frequency Offset

Syntax
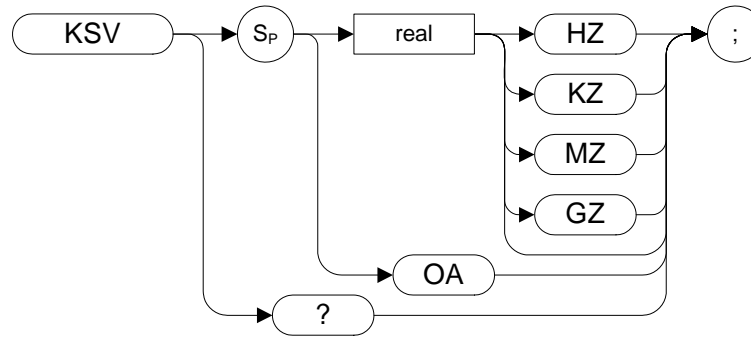
Legacy Products

8566A/B, 8568A/B

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 159).

KSx
External Trigger

Syntax
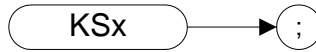
Legacy Products

8566A/B, 8568A/B

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.
	In the N9061A application of X-Series analyzers, 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 .

KSy
Video Trigger

Syntax

$$\text{KSy} \longrightarrow ;$$

Legacy Products

8566A/B, 8568A/B

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. In the N9061A application of X-Series analyzers, 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 337) and to the T4 command (page 329).

KSZ
Reference Level Offset

Syntax
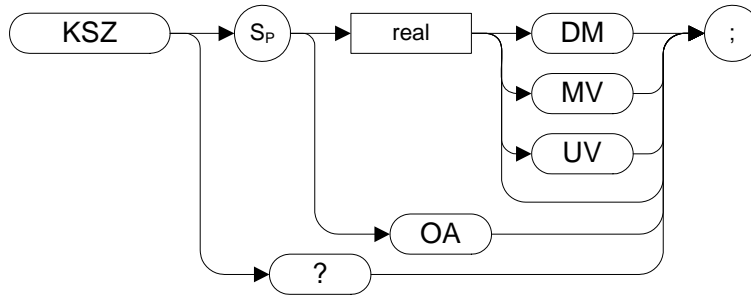
Legacy Products

8566A/B, 8568A/B

Description

The KSZ command offsets all amplitude readouts on the display but without affecting the trace. Note the 8566A/B only supports unit DM.

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 304).

L0 [zero]
Display Line Off

Syntax
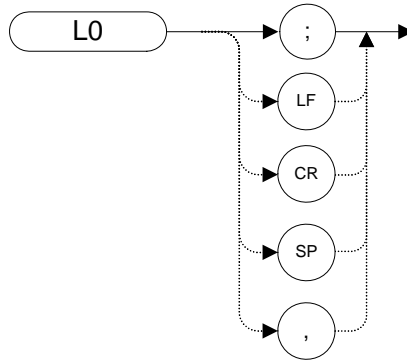
Legacy Products

8560 series, 8566A/B, 8568A/B

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 143).

LF
Low Frequency Preset

Syntax

```
( LF ) ⟶ ( ; )
```

Legacy Products

8566A/B

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.

LG
Logarithmic Scale

Syntax
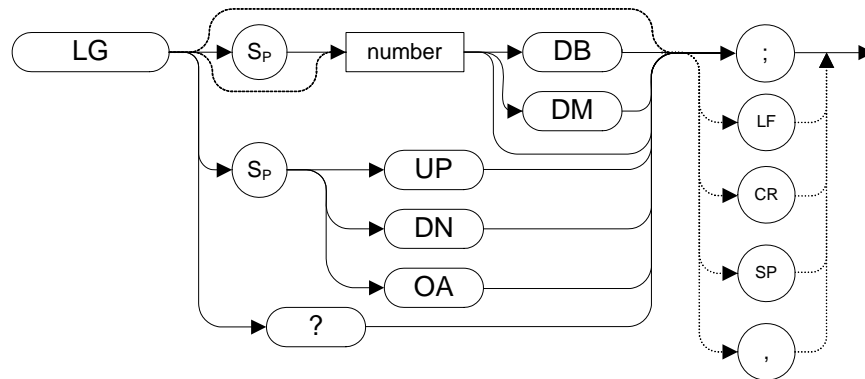
Legacy Products

8560 series, 8566A/B, 8568A/B

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 4-22

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

Table 4-22

Remote Language	Integer Range using the LG Command
8568B	1, 2, 5, and 10

LIMF
Limit Line Frequency Value

Syntax
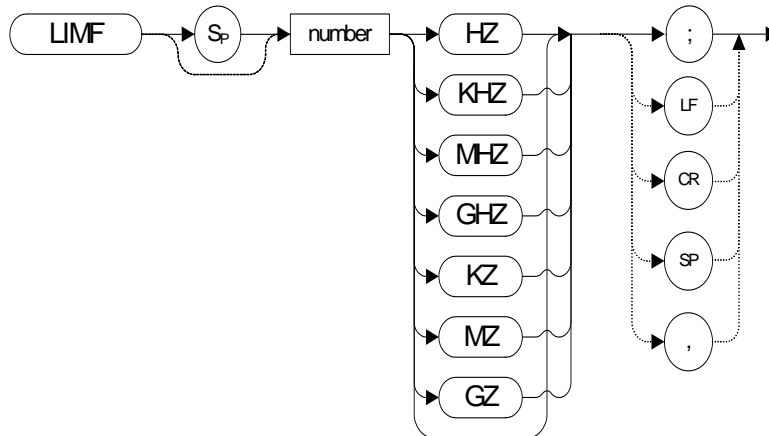
Legacy Products

8560 series

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 not supported by N9061A.

LIMIFAIL
Limits Failed

Syntax
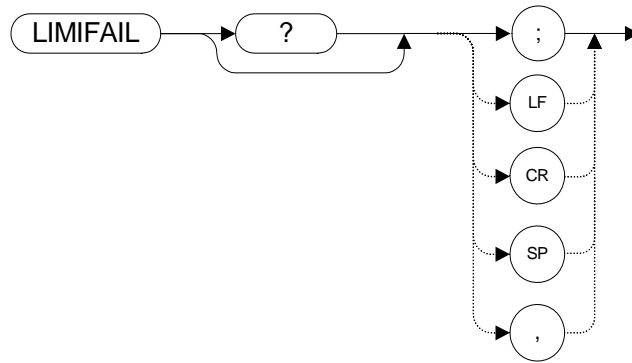
Legacy Products

8560 series

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 4-23   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.

LIMIPURGE
Delete Current Limit Line

Syntax

LIMIPURGE ⟶ ;

Legacy Products

8560 series

Description

The LIMIPURGE command deletes the current limit line.

LIMIREL
Relative Limit Lines

Syntax
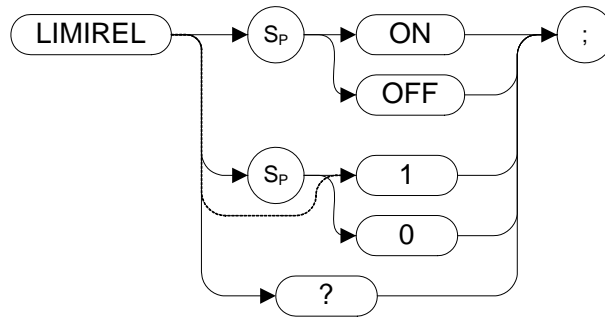
Legacy Products

8560 series

Description

Specifies whether the current limit lines are fixed or relative.

LIML
Lower-Limit Amplitude

Syntax

```
LIML ──→ Sᴘ ──→ number ──→ DB ──→ ;
                        └─→ DBM ─┘
```
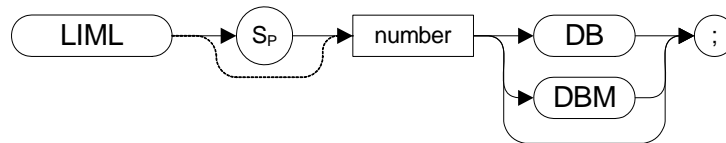
Legacy Products

8560 series

Description

The LIML command assigns the lower-limit amplitude value to a limit-line segment.

LIMTSL
Slope Limit Line

Legacy Products

8560 series

Description

The LIMTSL command makes the selected limit-line segment sloped. Default setting is sloped.

LIMU
Upper-Limit Amplitude
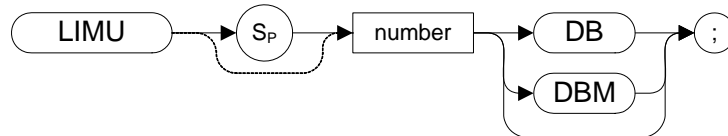
Syntax

Legacy Products

8560 series

Description

The LIMU command assigns the upper-limit amplitude value to a limit-line segment.

LN
Linear Scale

Syntax

```
LN ────────▶( ; )───▶
      ┊
      └──▶( LF )┄┄
      ┊
      └──▶( CR )┄┄
      ┊
      └──▶( SP )
      ┊
      └──▶( , )
```
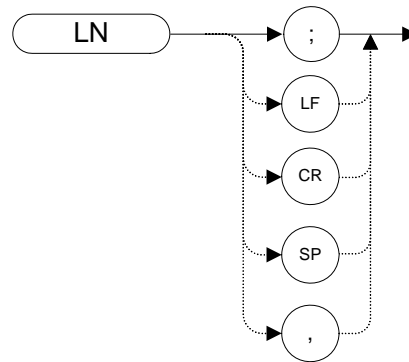
Legacy Products

8560 series, 8566A/B, 8568A/B

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 V.

M1 [one]
Marker Off

Syntax

```
M1 ──────┐
         ├──▶( ; )──┐
         ├──▶( LF )─┤
         ├──▶( CR )─┤
         ├──▶( SP )─┤
         └──▶( , )──┘
```
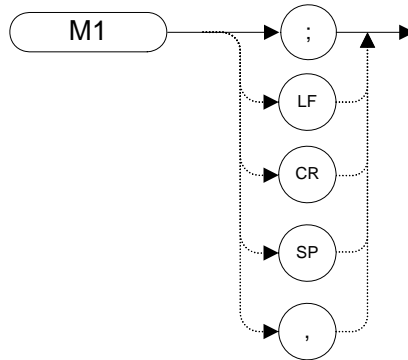
Legacy Products

8566A/B, 8568A/B

Description

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

| NOTE | Unlike the MKOFF ALL command (page 253), it blanks inactive markers as well. |

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M2 [two]
Marker Normal

Syntax
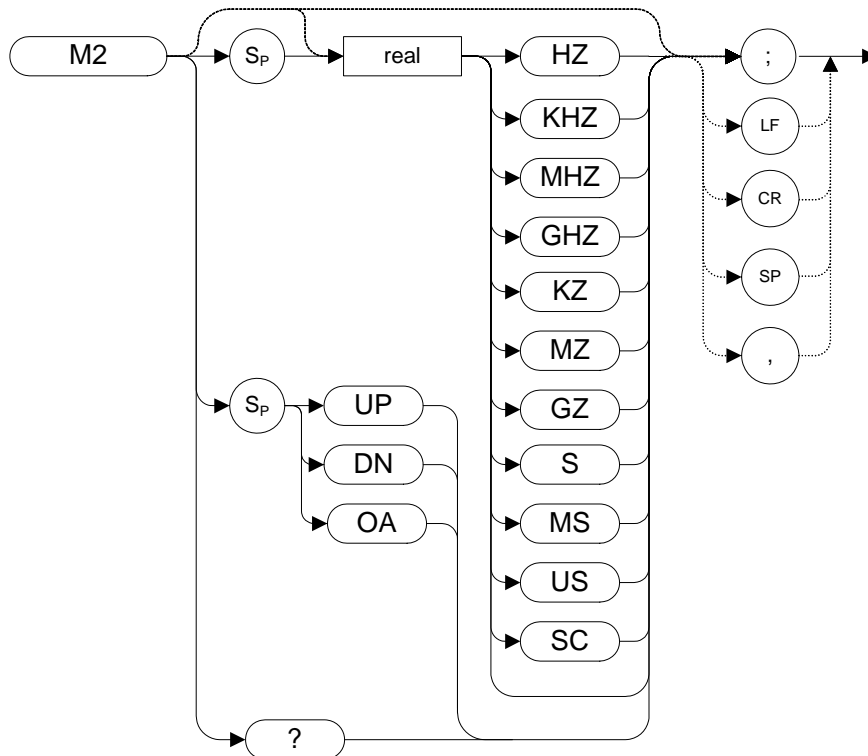
Legacy Products

8566A/B, 8568A/B

Description

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

NOTE	The functions of the M2 command are identical to the MKN command .

NOTE	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
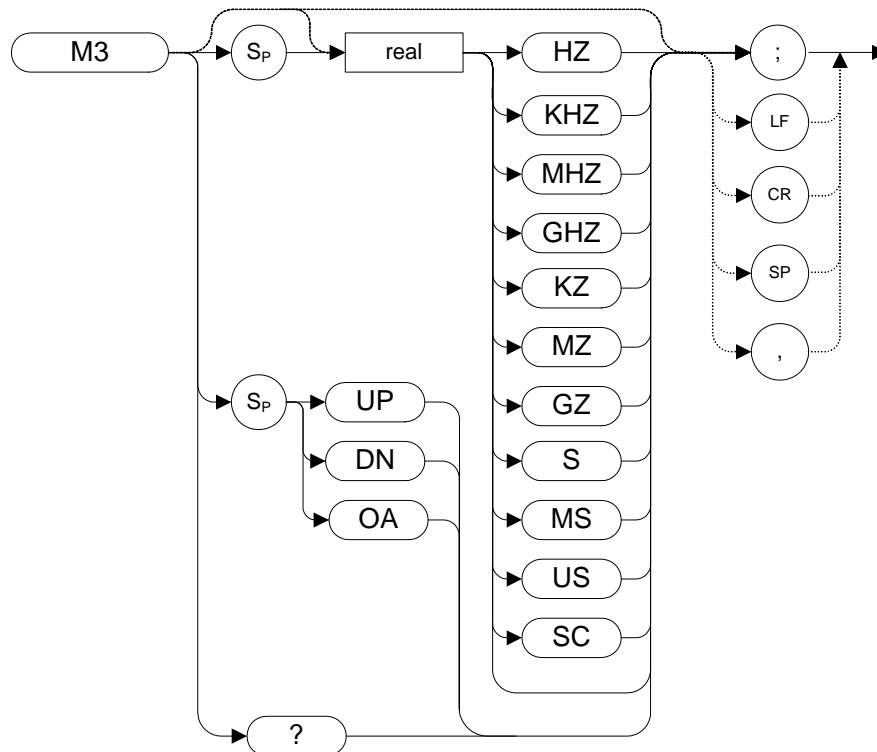
Legacy Products

8566A/B, 8568A/B

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 242).

NOTE	The functions of the M3 command are identical to the MKD command (page 245).

M4 [four]
Marker Zoom

Syntax
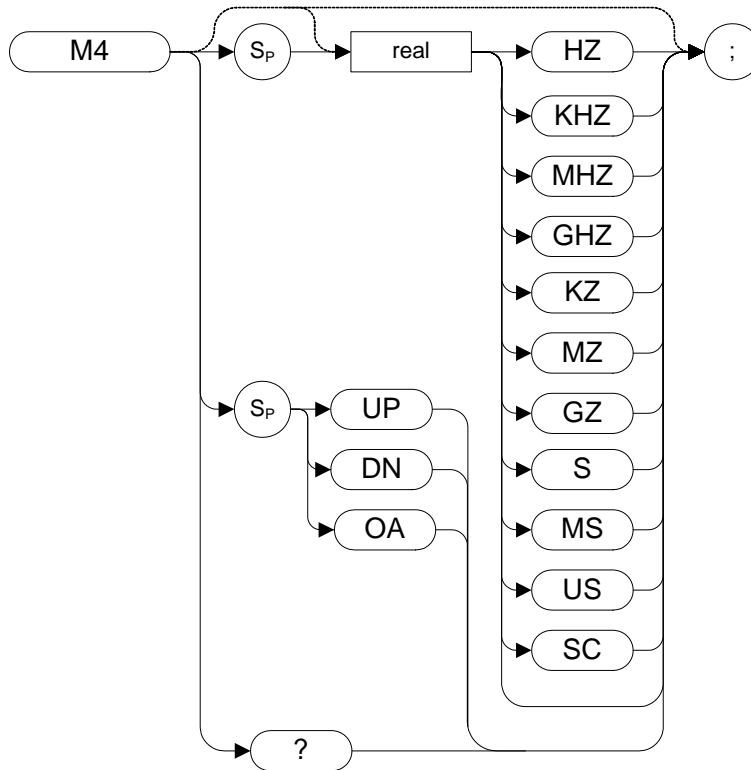
Legacy Products

8566A/B, 8568A/B

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
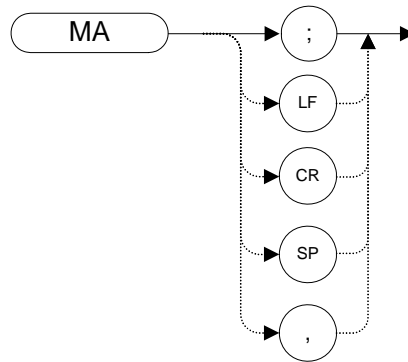
Legacy Products

8560 series, 8566A/B, 8568A/B

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.

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 8566.

8560 Series: 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 241).

MC0 [zero]
Marker Frequency Counter Off

Syntax

$$\text{MC0} \longrightarrow \; ;$$

Legacy Products

8568A/B

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 .

MC1 [one]
Marker Frequency Counter On

Syntax

$$\boxed{\text{MC1}} \longrightarrow (;)$$

Legacy Products

8568A/B

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 .

MDS
Measurement Data Size

Syntax

```
MDS → Sᴘ → B → ;
           → W
      → ?
```
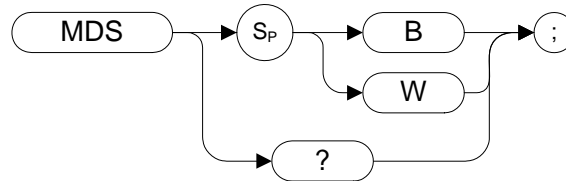
Legacy Products

8566A/B, 8568A/B

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
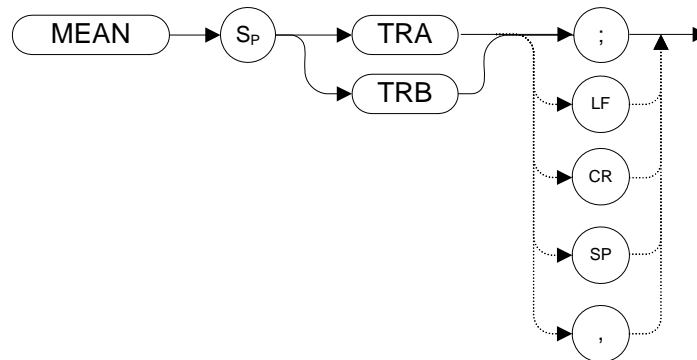
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

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

MEANPWR
Mean Power measurement

Syntax
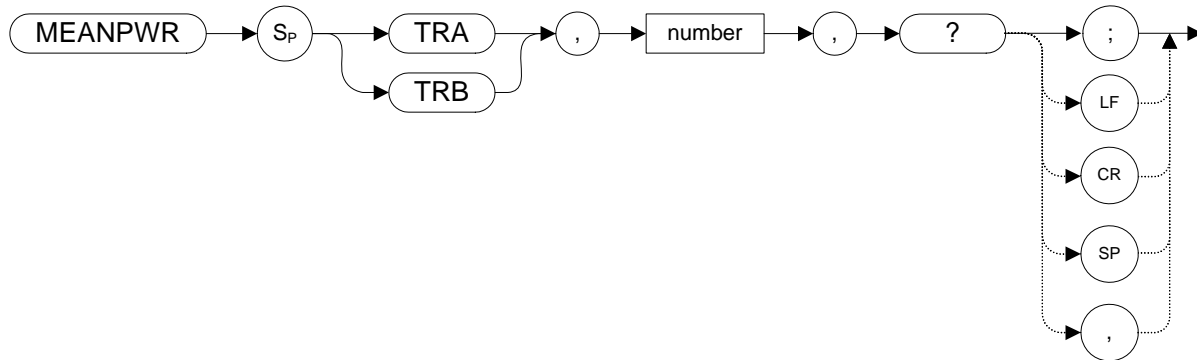
Legacy Products

8560 series

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 123), except that the CARRON command defines 'on' as that time when the signal is within 20 dB of its peak level.

MEAS
Meas

Syntax
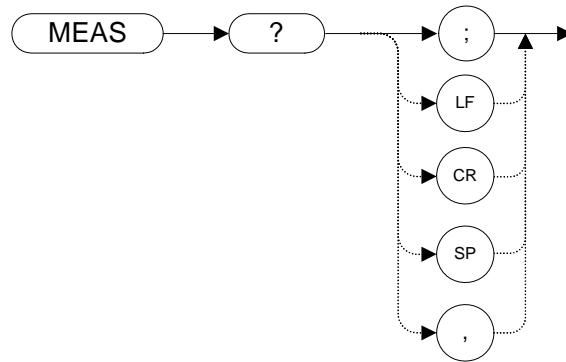
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Returns the current sweep status. If the analyzer is set to sweep and make measurements continuously, the command returns CONTS. If it is set to make a single sweep with a single measurement, the command returns SNGLS.

The analyzer can be set to single sweep using the SNGLS command and it can be set to continuos sweep using the CONTS command.

MF
Marker Frequency Output

Syntax

8560 series:
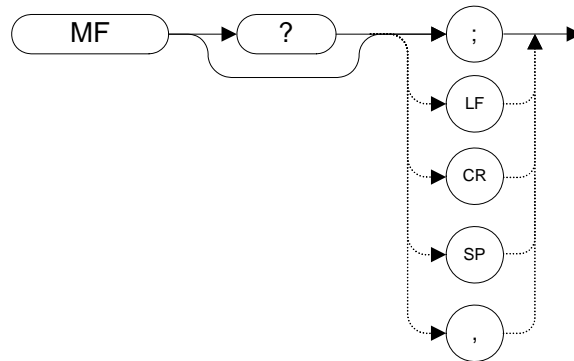
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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
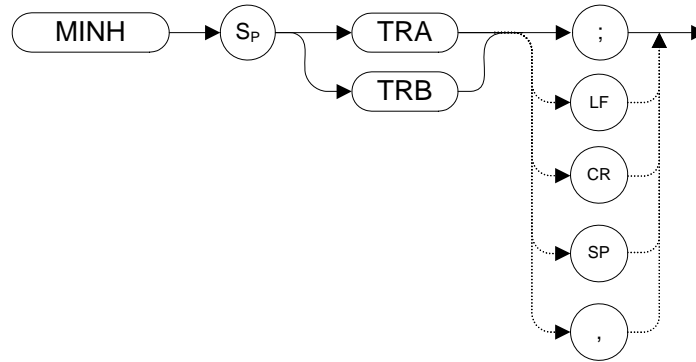
Legacy Products

8560 series

Description

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

For information on the trace settings of the X-series analyzers when legacy instrument trace settings are sent, see Table 4-4, "Legacy Products command mapping to X-series for trace/detector settings."

MINPOS
Minimum X Position

Syntax
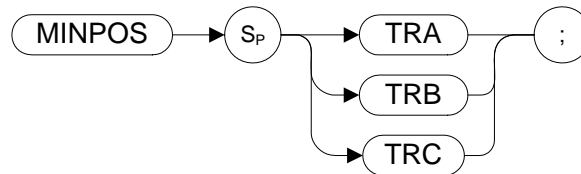
Legacy Products

8566A/B, 8568A/B

Description

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

MKA
Marker Amplitude

Syntax
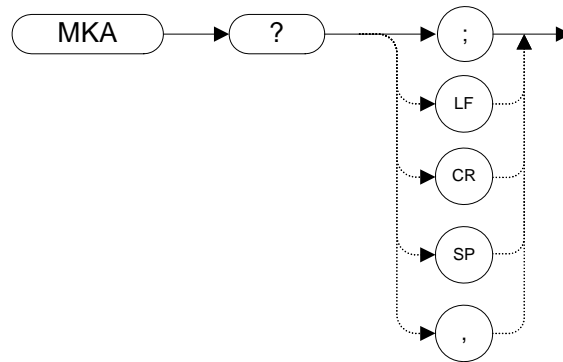
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The MKA 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 MKA command returns the amplitude difference between the two markers.

8560 Series: The marker amplitude is always returned as an ASCII value (TDF P).

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

NOTE	The functions of the MKA command are identical to the MA command (page 231).

MKACT
Activate Marker

Syntax

```
MKACT → Sₚ → marker number → ;
        → ? →
```
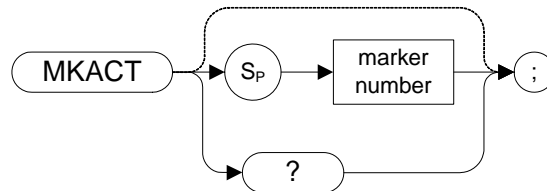
Table 4-24

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

Legacy Products

8566A/B, 8568A/B

Description

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

MKBW
Marker Bandwidth

Syntax

```
MKBW → S_P → number → , → ? → ;
                                 LF
                                 CR
                                 SP
                                 ,
```
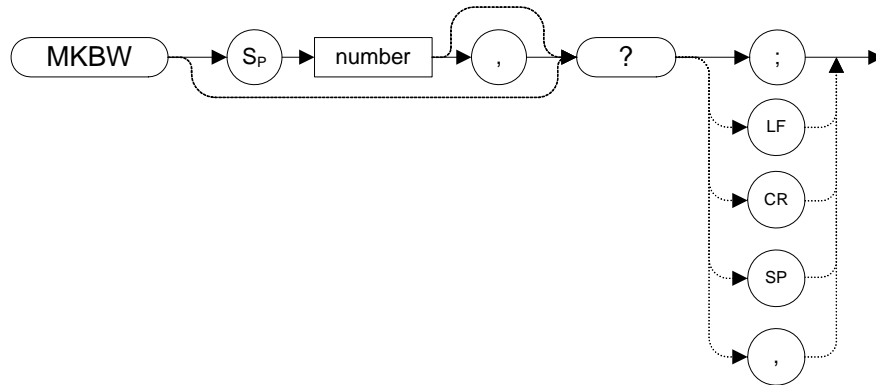
Legacy Products

8560 series

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
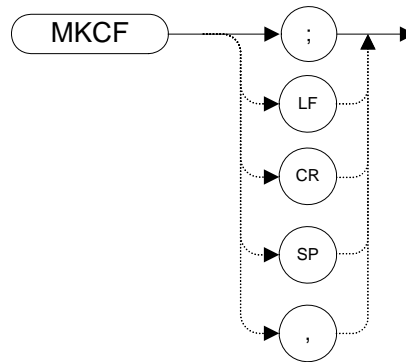
Legacy Products

8560 series, 8566A/B, 8568A/B

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 148).

MKD
Marker Delta

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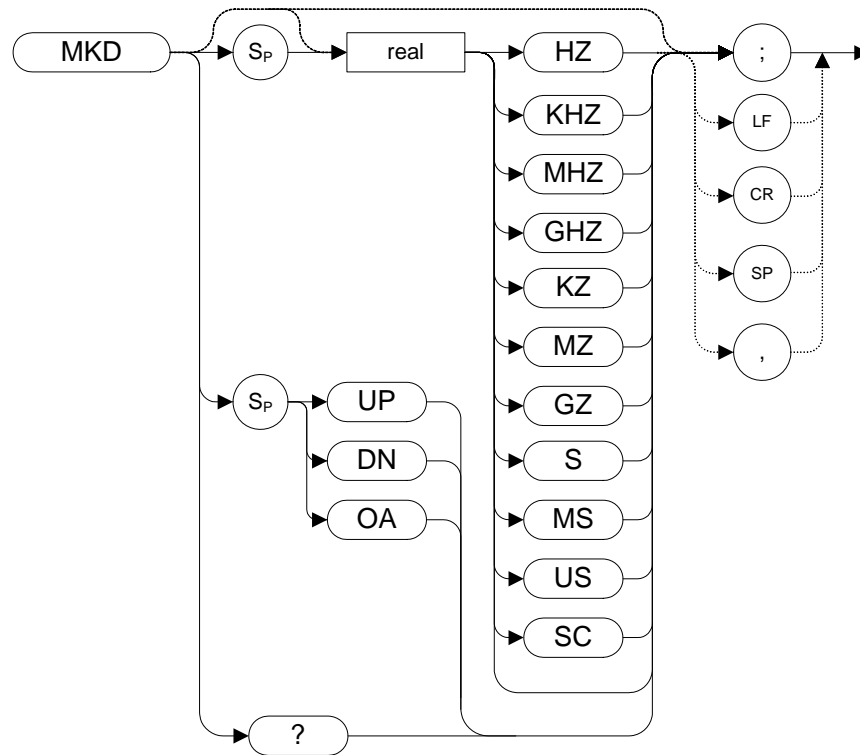
Step Increment: by 1/10 of the frequency span

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

If a delta marker is not displayed on the screen, the MKD command places one at the specified frequency or on the left or 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   For 8566A/B and 8568A/B, the functions of the MKD command are identical to the M3 command .

MKF
Marker Frequency

Syntax
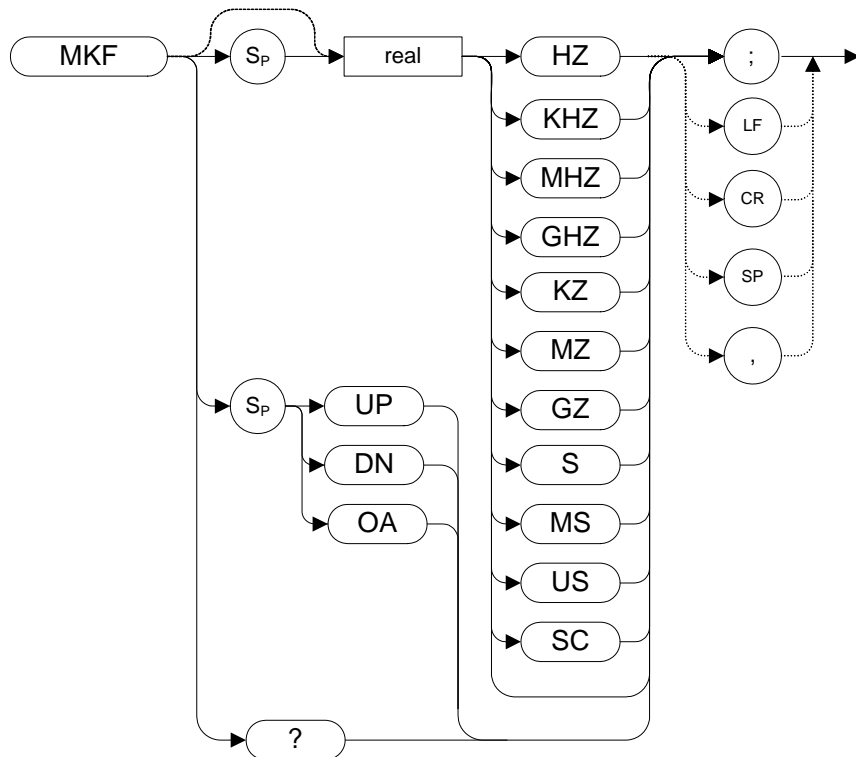
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Specifies the frequency value of the active marker.

8560 Series: The data is returned in ASCII format.

For all other languages, the format of the returned data is determined by the TDF (Trace Data Format) (page 332) command and, if TDF B (binary data format) has been selected, by the MDS command (page 234).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
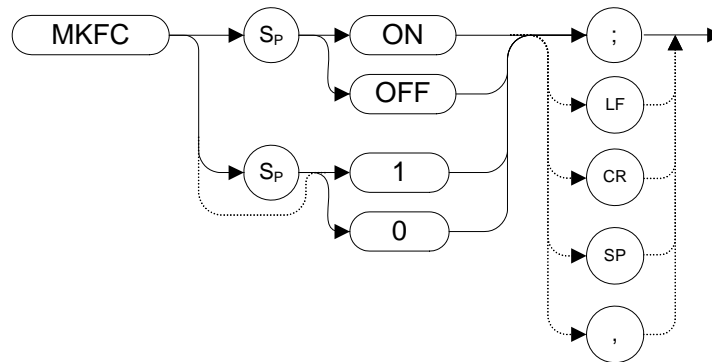
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Turns on or off the marker frequency counter. The resolution of the frequency marker counter is determined by the MKFCR command (page 248).

NOTE	The functions of the MKFC command are identical to the MC0 **[zero]** command (page 232) and MC1 **[one]** command (page 233).

NOTE	For 8568A/B, the functions of the MKFC command are identical to the MC0 or MC1 command.

MKFCR
Marker Counter Resolution

Syntax

8560 series:
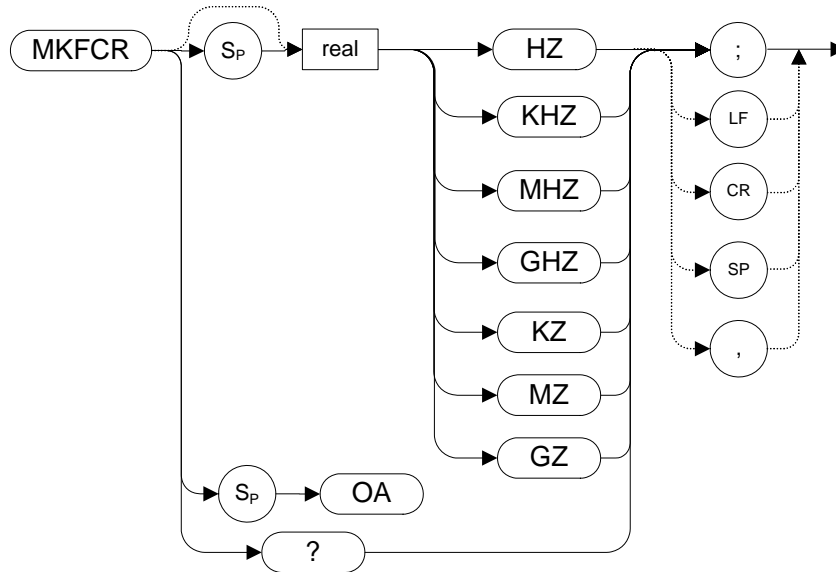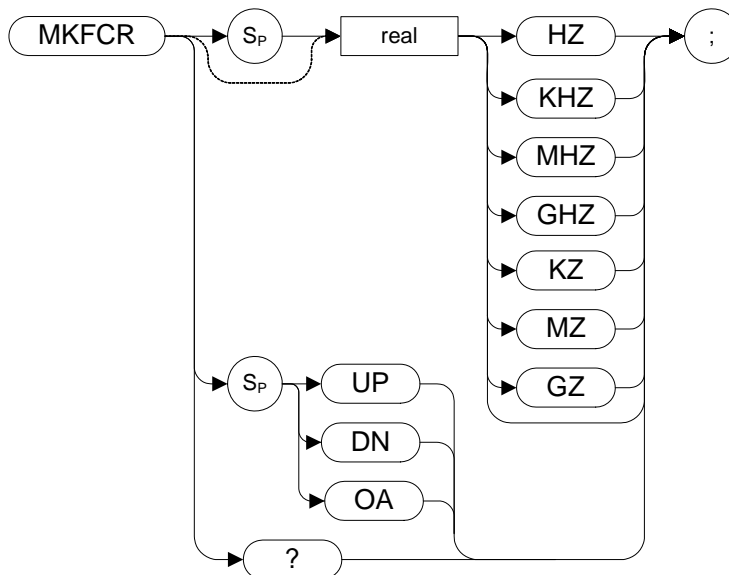
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Sets the resolution of the marker frequency counter. The marker counter resolution 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	For 8566A/B, 8568A/B, the functions of the MKFCR command are identical to the KS= command (page 180).

MKMIN
Marker Minimum

Syntax
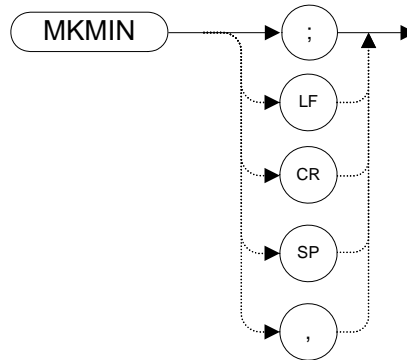
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Moves the active marker to the minimum value detected.

NOTE	For 8566A/B, 8568A/B, the functions of the MKMIN command are identical to the KSN command (page 205).

MKN
Marker Normal

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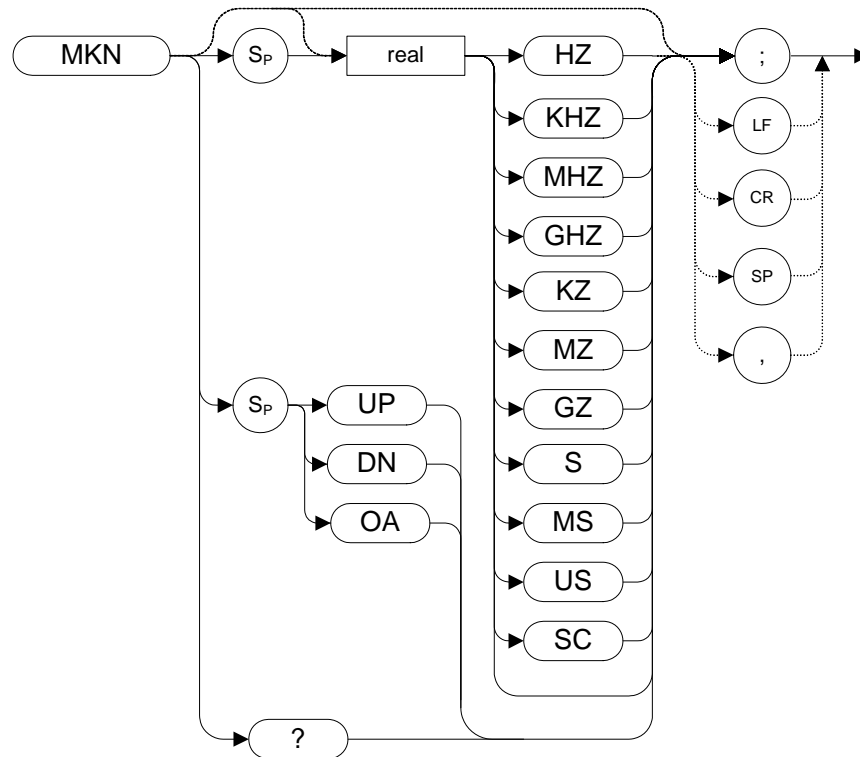
Step Increment: by 1/10 of the frequency span.

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The MKN command moves the active marker to the specified frequency. If no marker is currently turned on, a normal marker is turned on. If the active marker type is not currently normal (for example, it is delta), the MKN command changes it to a normal marker.

NOTE	The functions of the MKN command are identical to the M2 **[two]** command (page 228).

MKNOISE
Marker Noise

Syntax
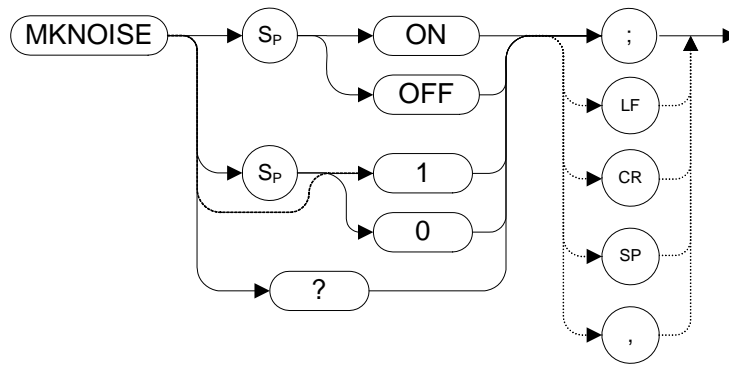
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Displays the average RMS noise density at the marker.

NOTE	For 8566A/B, 8568A/B, the functions of the MKNOISE command are identical to the KSM command (page 203).

MKOFF
Marker Off

Syntax

```
MKOFF  →  SP  →  ALL  →  ;
                         LF
                         CR
                         SP
                         ,
```
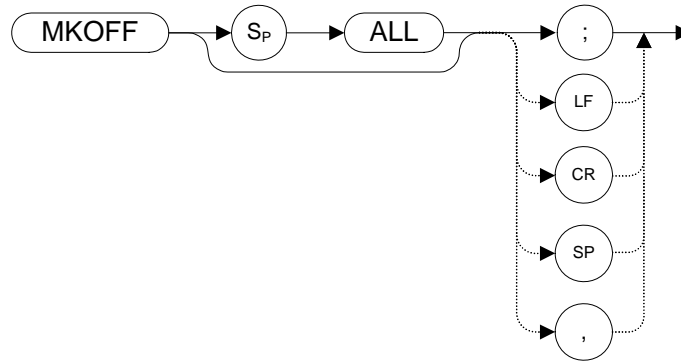
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

MKP
Marker Position

Syntax

```
MKP → SP → integer → ;
      ↓
      ? ──────────────┘
```
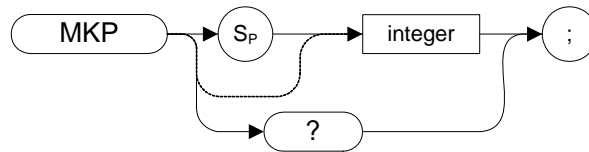
Legacy Products

8566A/B, 8568A/B

Description

Specifies the marker position horizontally, in display units.

MKPK
Marker Peak

Syntax
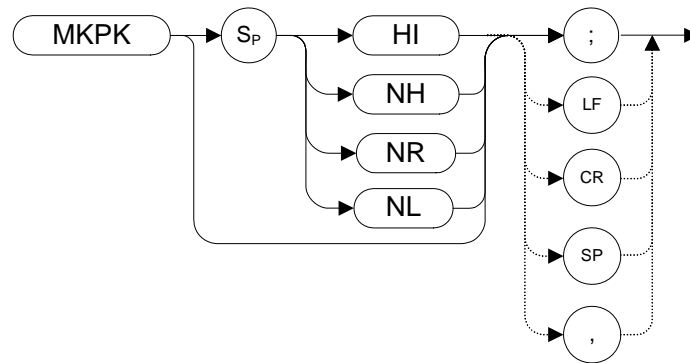
Legacy Products

8560 series, 8566A/B, 8568A/B

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 147).

NOTE	For 8566A/B, 8568A/B, the functions of the MKPK NH command are similar to the KSK command (page 199), 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 257).

MKPT
Marker Threshold

Syntax
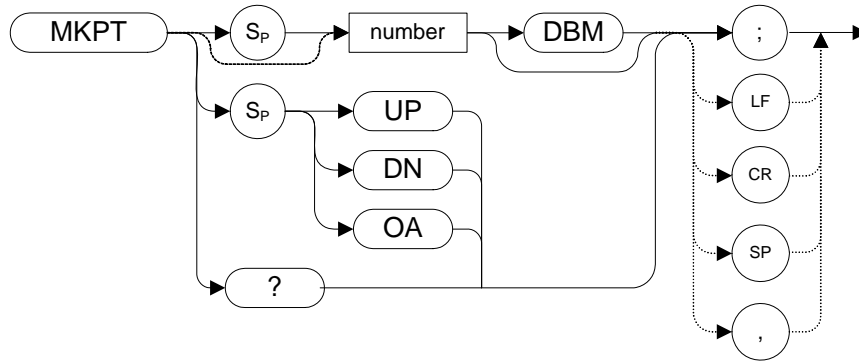
Legacy Products

8560 series

Description

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

MKPX
Marker Peak Excursion

Syntax
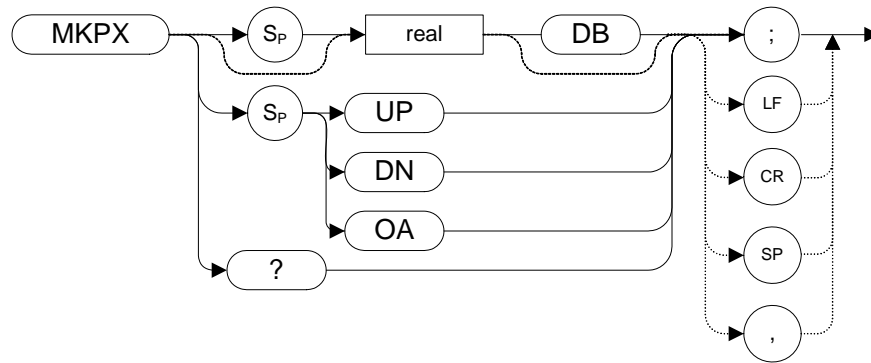
Preset State: 6 dB

Step Increment: 1 dB

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Specifies the minimum signal excursion for the 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

```
(MKREAD) → SP → FRQ → ;
              → SWT →
              → IST →
              → PER →
         → ? →
```
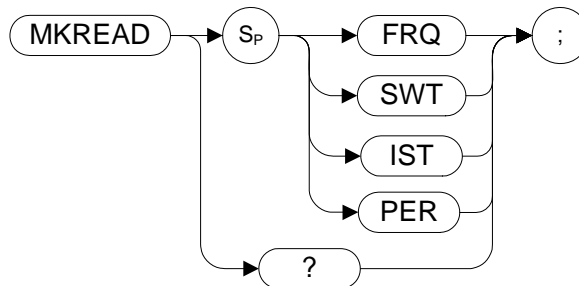
Legacy Products

8566A/B, 8568A/B

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 4-25

MKREAD Type	Non-Zero Span	Non-Zero Span Delta	Zero Span	Zero Span Delta
FRQ	Reads frequency	Reads delta frequency	N/A	N/A

Table 4-25

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

```
MKRL ──┬──────▶ ; ──┬──▶
       ┊             ┊
       ┊···▶ LF ···┊
       ┊             ┊
       ┊···▶ CR ···┊
       ┊             ┊
       ┊···▶ SP ···┊
       ┊             
       └────▶ , 
```
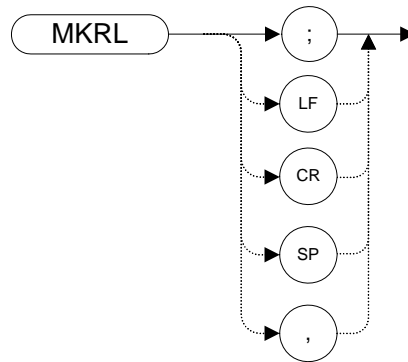
Legacy Products

8560 series, 8566A/B, 8568A/B

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 150).

MKSP
Marker Span

Syntax
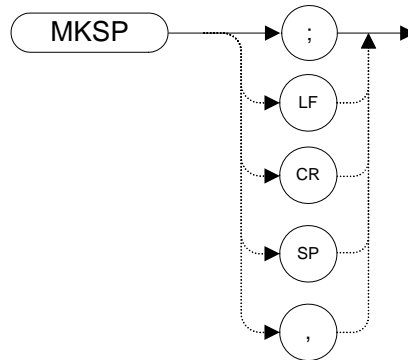
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The MKSP command operates only when the delta marker is On (see MKD (page 245) or M3 (page 229)). 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	For 8566A/B, 8568A/B, The functions of the MKSP command are identical to the KSO command (page 207).

MKSS
Marker to Step Size

Syntax
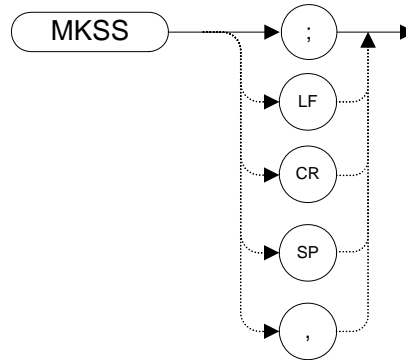
Legacy Products

8560 series, 8566A/B, 8568A/B

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 149).

MKT
Marker Time

Syntax
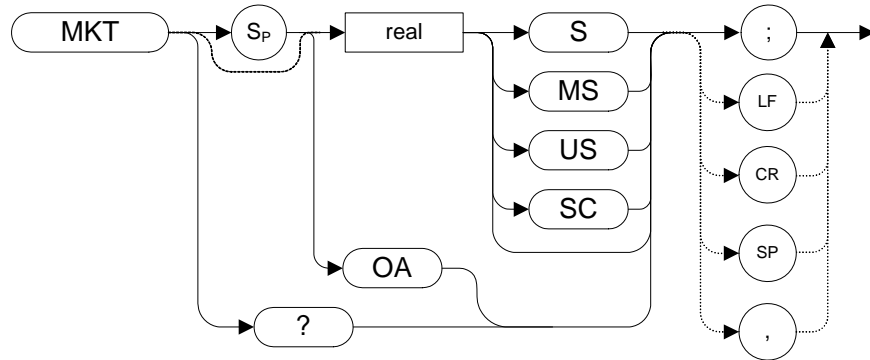
Legacy Products

8560 series

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').

MKTRACE
Marker Trace

Syntax
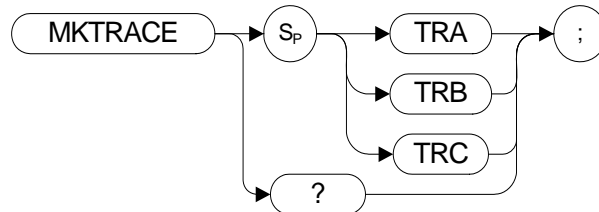
```
MKTRACE → Sp → TRA → ;
              → TRB →
              → TRC →
         → ? →
```

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

Legacy Products

8566A/B, 8568A/B

Description

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

MKTRACK
Marker Track

Syntax
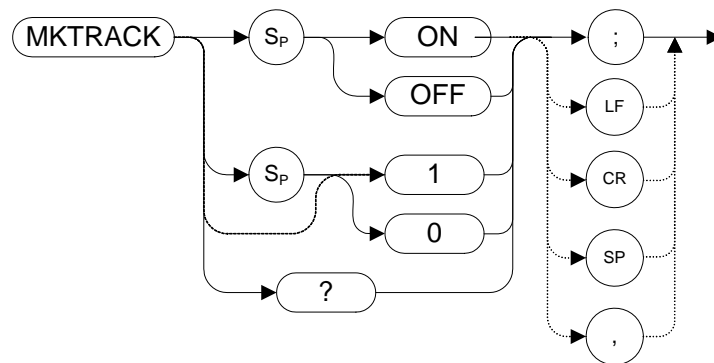
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Moves the signal on which the active marker is located to the center of the 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	For 8566A/B, 8568A/B, the functions of the MKTRACK command are identical to the MT0 **[zero]** command (page 269) and the MT1 **[one]** command (page 270).

MKTYPE
Marker Type

Syntax
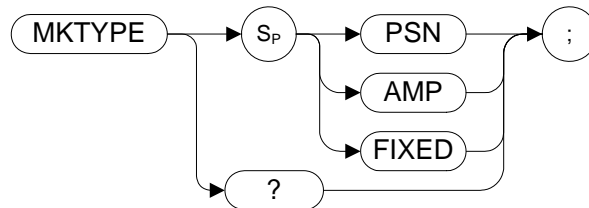
Legacy Products

8566A/B, 8568A/B

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:
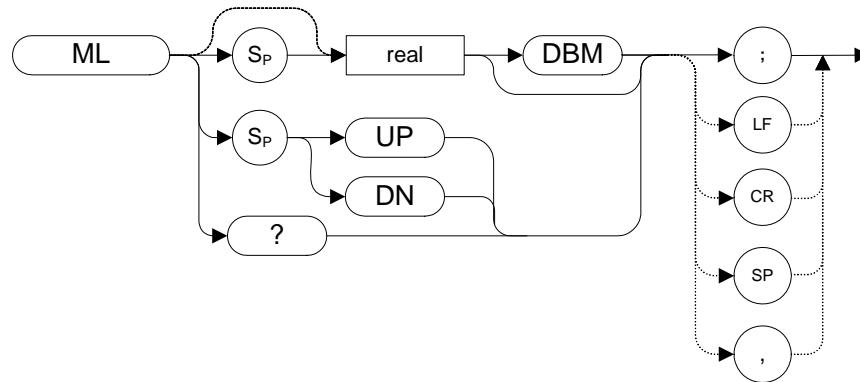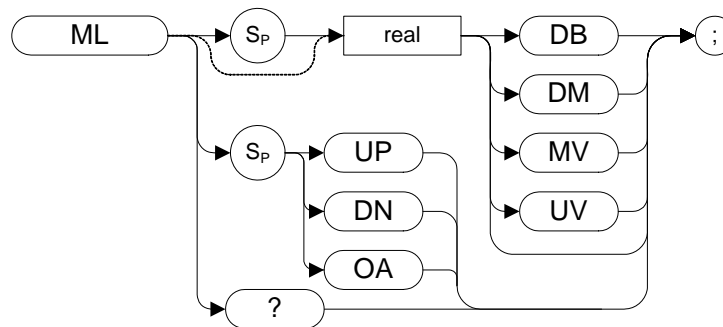
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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 71.

NOTE	For 8566A/B, 8568A/B, the functions of the ML command are identical to the KS, command (page 179).

MT0 [zero]
Marker Track Off

Syntax
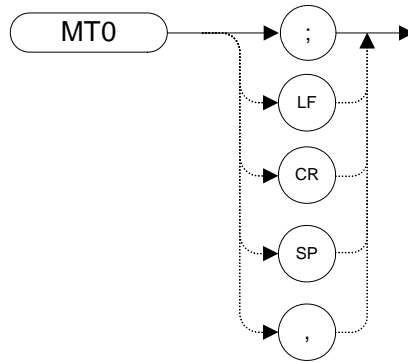
Legacy Products

8566A/B, 8568A/B

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 265).

MT1 [one]
Marker Track On

Syntax
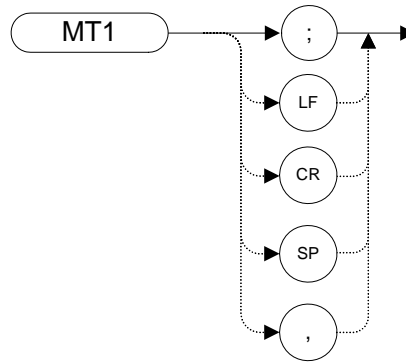
Legacy Products

8566A/B, 8568A/B

Description

Moves the signal on which the active marker is located to the center of the 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 265).

MXMH
Maximum Hold

Syntax
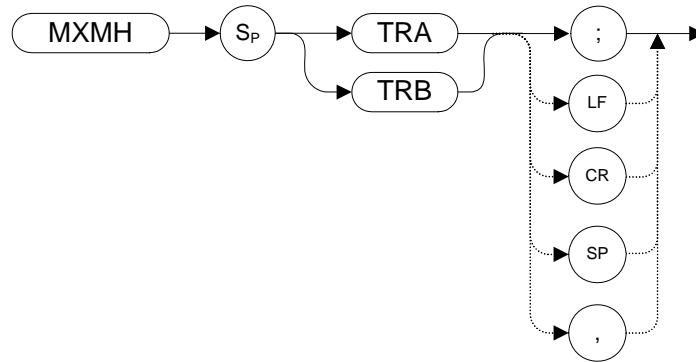
Legacy Products

8560 series, 8566A/B, 8568A/B

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 80)and B2 command (page 111).

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

For information on the trace settings of the X-series analyzers when legacy instrument trace settings are sent, see Table 4-4, "Legacy Products command mapping to X-series for trace/detector settings."

NORMLIZE
Normalize Trace Data

Syntax
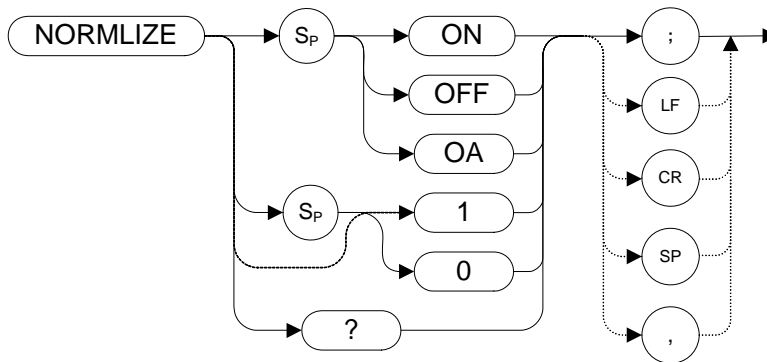
The preset state is OFF.

Legacy Products

8560 series

Description

Activates or de-activates the normalization routine for stimulus-response measurements. This function subtracts trace B from trace A, offsets the result by the value of the normalized reference position (NRL) and displays the result in trace A.

If active (ON), the NORMLIZE command is automatically turned off with an instrument preset (IP) or at power on.

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

Normalization is not available when using linear mode and is mutually exclusive with other trace math.

NRL
Normalized Reference Level

Syntax
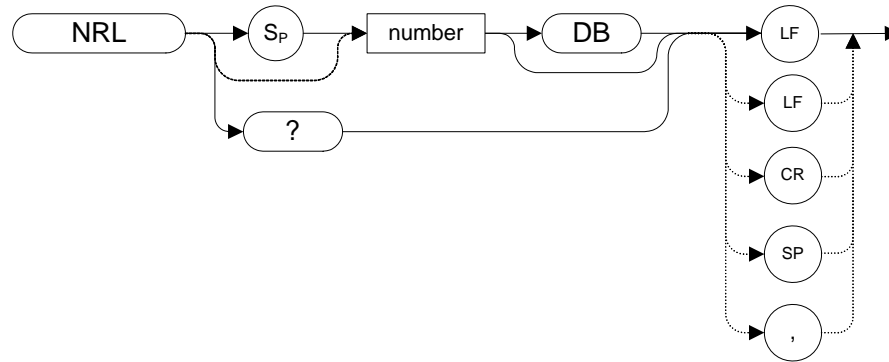
The preset value is 0 dB.

Legacy Products

8560 series

Description

Sets the normalized reference level. It is intended to be used with the NORMLIZE command. When using NRL, the input attenuator and IF step gains are not affected. This function is a trace-offset function enabling the user to offset the displayed trace without introducing hardware switching errors into the stimulus-response measurement. The unit of measure for NRL is dB.

NRPOS
Normalized Reference Position

Syntax
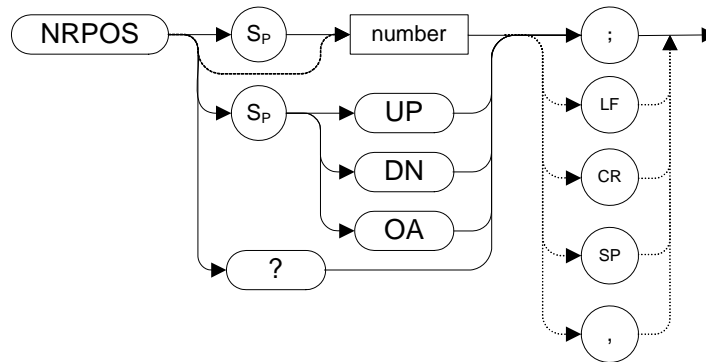
The preset value is 10.

Legacy Products

8560 series

Description

The NRPOS command adjusts the normalized reference-position that corresponds to the position on the graticule where the difference between the measured and calibrated traces reside. The dB value of the normalized reference position is equal to the normalized reference level. The normalized reference position can be adjusted between 0.0 and 10.0, corresponding to the bottom and top graticule lines, respectively.

O1 [one]
Format - Display Units

Syntax

O1 ⟶ ;

Legacy Products

8566A/B, 8568A/B

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

$$\boxed{\text{O2}} \longrightarrow (\,;\,)$$

Legacy Products

8566A/B, 8568A/B

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

Legacy Products

8566A/B, 8568A/B

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

O4 ⟶ ;

Legacy Products

8566A/B, 8568A/B

Description

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

OA or ?
Query Active Function

Legacy Products

8566A/B, 8568A/B

Description

Query active function.

The active functions are ACPBW, ACPSP, AT, CF, CRTHPOS, CRTVPOS, DA, DL, DOTDENS, FA, FB, FMGAIN, GD, GL, LG, MKA, MKD, MKFCR, MKN, MKPAUSE, MKPX, ML, NDB, NRL, RB, RCLS, ROFFSET, RL, RLPOS, SAVES, SAVRCLN, SETDATE, SETTIME, SP, SQLCH, SRCALC, SRCAT, SRCPOFS, SRCPSWP, SRCPWR, SRCTK, SS, ST, TH, TVLINE, VB, VBR, and user-defined active function specified by the ACTDEF command.

OCCUP
Percent Occupied Power Bandwidth

Syntax
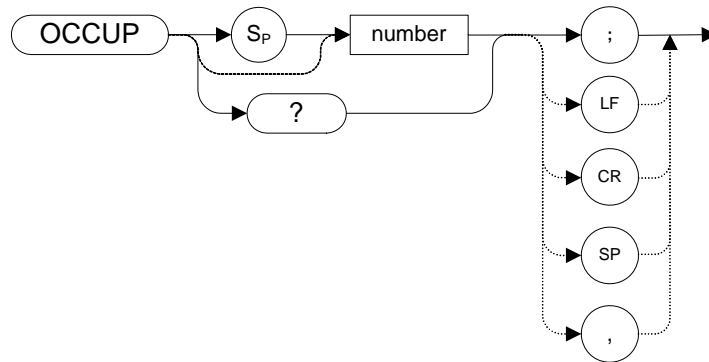
Legacy Products

8560 series

Description

The OCCUP command is used to query the current value of the percent occupied power. This value is set by the DELMKBW (page 139) and the PWRBW command (page 290) command. The OCCUP command can also be used to set the percent occupied power.

OL
Output Learn String

Syntax
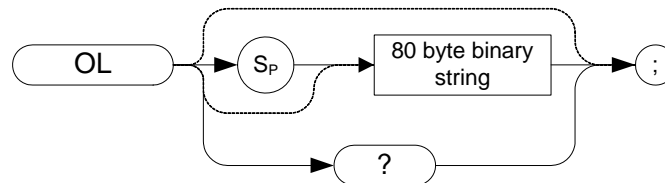
Legacy Products

8566A/B, 8568A/B

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 X-Series and 8566/8568. The following table outlines each byte of the array and the bits supported within that byte.

Byte	Support Information
1	Fixed decimal value 31
2	Fixed decimal value 118
3 to 9	Supported
10	Supported
11	Unsupported: Fixed decimal 0
12 to 17	Supported
18	Supported: Bits 6, 2, 1 and 0
	Unsupported: Bits 7, 5, 4, and 3

Byte	Support Information
19	Supported: Bits 7, 6, 4, 3, and 0 Bit 5 on X-Series only Unsupported: Bits 1 and 2
20	Supported: Trigger Mode, Sweep Mode, TRB Clearwrite status Unsupported: Recorder Output
21	Supported
22	Unsupported: Fixed decimal 0
23 to 25	Supported
26	Supported: Scale Type, Log Scale Factor, and Display State Unsupported: XY Recorder
27	Supported
28	Unsupported: Fixed decimal 0
29 to 30	Supported
31	Unsupported: Fixed decimal 0
32 to 37	Supported
38	Unsupported: Fixed decimal 0
39 to 45	Supported
46 to 47	VAVG count limit, value returned is always current count value * 2.
48 to 53	Supported
54 to 57	If active marker is a delta marker, active marker absolute Y position only supported for X-Series
58 to 61	If active marker is a delta marker, reference marker absolute Y position only supported for X-Series
62	Unsupported: Fixed decimal 0
63	Supported
64	Supported: Log Amp Units, R3, R2, and R4 Unsupported: Stop sweep

Byte	Support Information
65	Supported: Lin Amp Units, TRC View Status
	Unsupported: Bits 5 and 4 (always set HI)
66 to 71	Supported
72	Unsupported: Fixed decimal 0
73	Supported: Video Avg
	Unsupported: Power on last, Ext Ref Lvl, Fast HP-IB, Bit 4 (always set HI)
74 to 77	Unsupported: Fixed decimal 0
78	Unsupported
79	Unsupported: Fixed decimal 0
80	Fixed decimal 162

OT
Output Trace Annotations

Syntax

$$\boxed{OT} \longrightarrow \bigcirc{;}$$

Legacy Products

8566A/B, 8568A/B

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 X-Series analyzers.

PEAKS
Peaks

Syntax

8560 series:
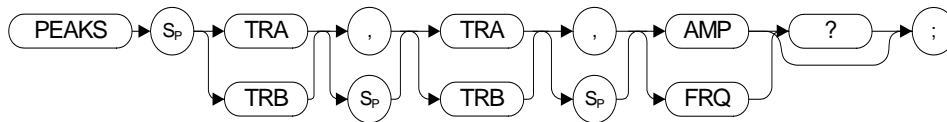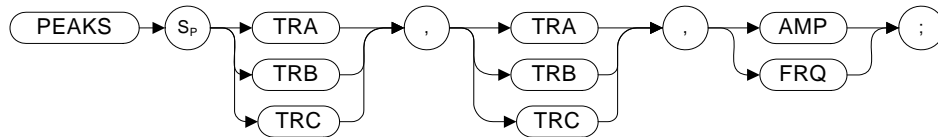
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

PKPOS
Peak Position

Syntax

```
PKPOS ──► Sp ──► TRA ──── ;
              ──► TRB
              ──► TRC
```
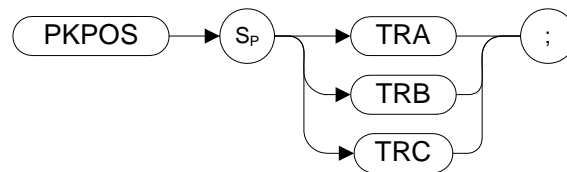
Legacy Products

8568

Description

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

PLOT
Plot

Syntax
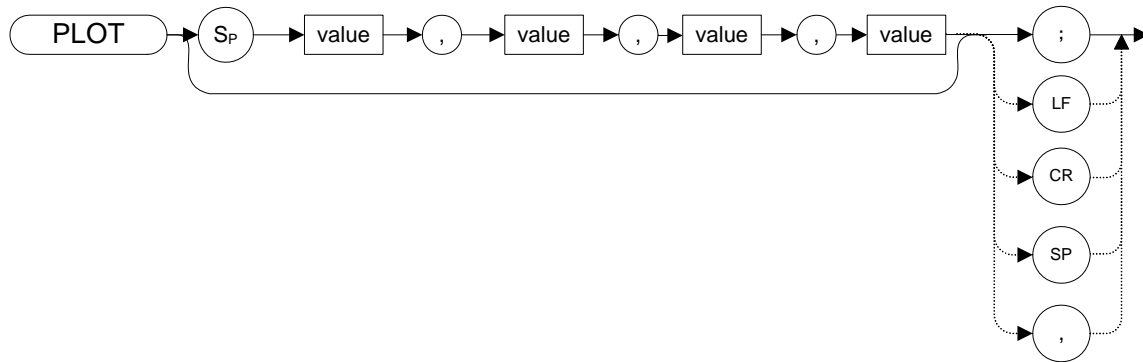
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

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.

Although the PLOT command reads in plotter dimension values, these are ignored.

NOTE	In legacy instruments, the PLOT command also returns HPGL. The X-series instruments with the N9061A application installed does not return HPGL.

PP
Preselector Peak

Syntax
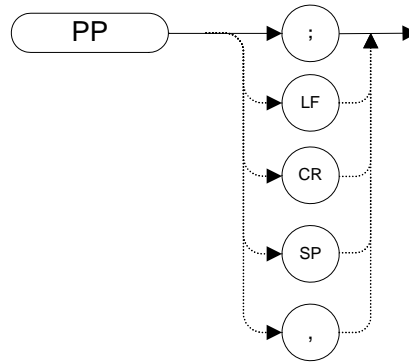
Legacy Products

8560 series, 8566A/B

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 X-series analyzer's maximum frequency limit is greater than 3.6 GHz. If the command is issued on an analyzer with a maximum frequency limit of 3.6 GHz or less the command is not implemented and no error is generated.

PRINT
Print

Syntax
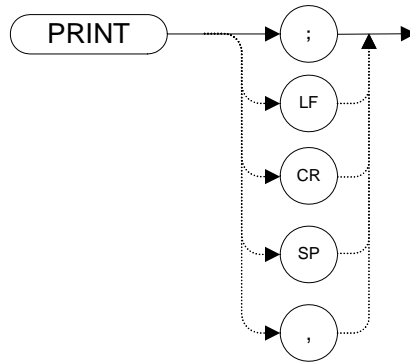
Legacy Products

8560 series

Description

Transfers trace data, graticule and annotation of the analyzer screen directly to the X-series analyzer's default printer.

PWRBW
Power Bandwidth

Syntax
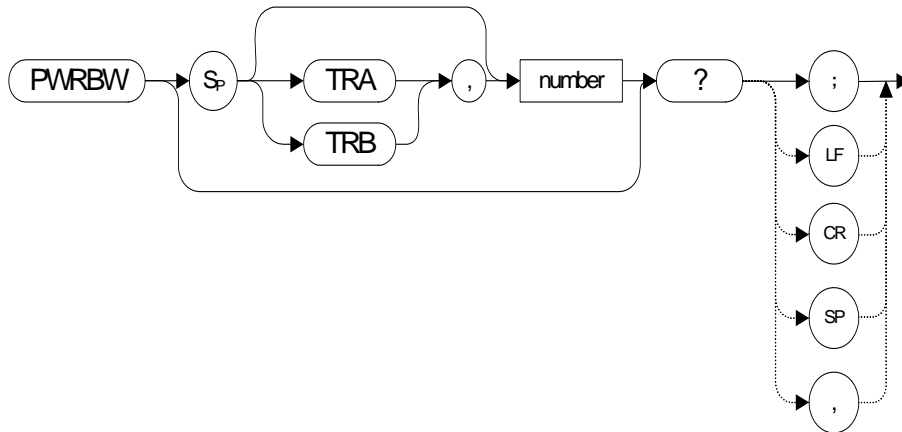
8560 Series:
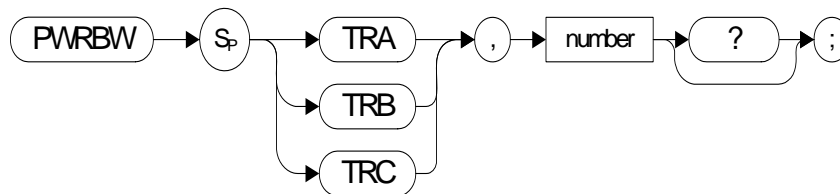
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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 the N9061A application.

R1 [one]
Illegal Command SRQ

Syntax

$$\boxed{R1} \longrightarrow (\ ;\ )$$

Legacy Products

8566A/B, 8568A/B

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

$$\boxed{\text{R2}} \longrightarrow (\ ;\ )$$
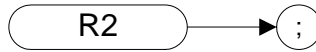
Legacy Products

8566A/B, 8568A/B

Description

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

R3 [three]
Hardware Broken SRQ

Syntax

```
( R3 ) ⟶ ( ; )
```

Legacy Products

8566A/B, 8568A/B

Description

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

R4 [four]
Units-Key-Pressed SRQ

Syntax

$$\boxed{R4} \longrightarrow (\,;\,)$$
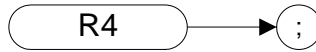
Legacy Products

8566A/B, 8568A/B

Description

The R4 **[four]** command activate the units-key-pressed and illegal-command SRQs. Same as RQS 34.

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

RB
Resolution Bandwidth

Syntax
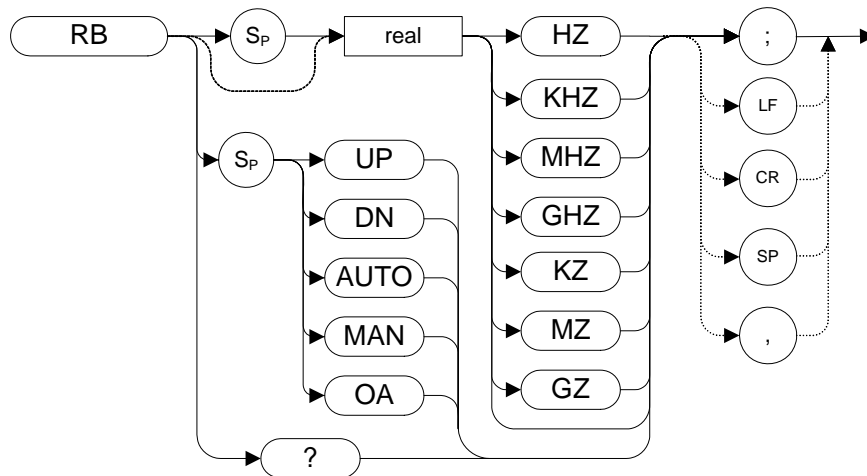
8560 series:
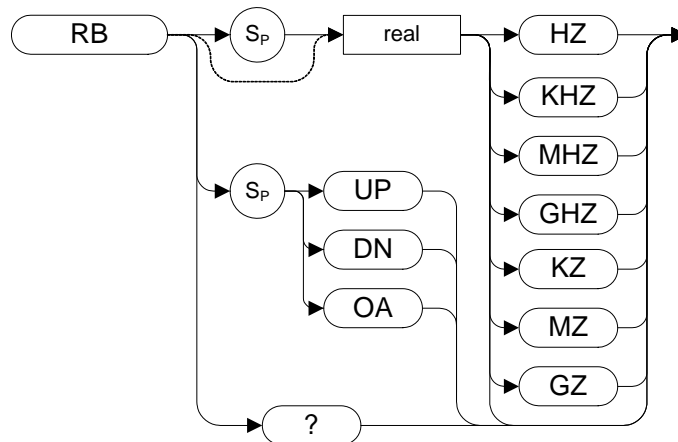
8566A/B, 8568A/B:

Preset State:

8560 series: 1 MHz, auto coupled

8566A/B, 8568A/B: 3 MHz, auto coupled

Step Increment: In a 1, 3, 10 series

Preset State: 3 MHz, auto coupled

Step Increment: In a 1, 3, 10 series

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The RB command specifies the resolution bandwidth. Available bandwidths are 1 Hz, 3 Hz, 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 134) to re-establish coupling.

NOTE	Default values on X-Series analyzers may vary from the legacy analyzers. Refer to the X-Series User's and Programmer's Reference to find out any restrictions that may apply.

RBR
Resolution Bandwidth to Span Ratio

Syntax
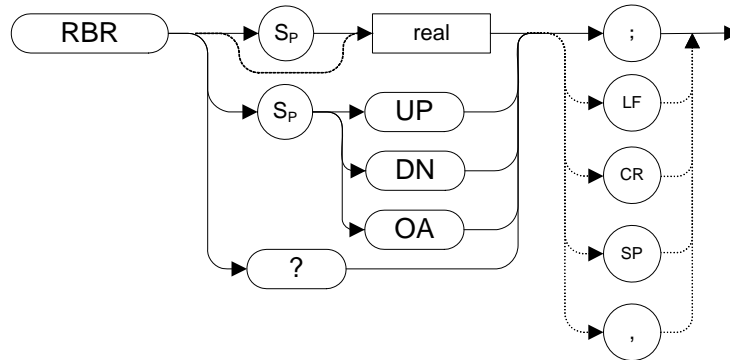
Legacy Products

8560 series

Description

This command sets the coupling ratio between the frequency span and the resolution bandwidth. It allows you to set the Span/RBW ratio to 1/<value>, where <value> is set by the user.

RC
Recall State

Syntax

8560 series:
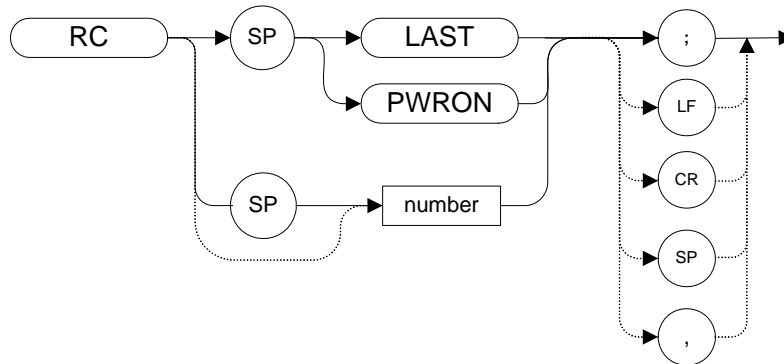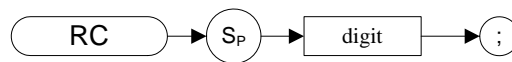
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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 308) or the SV command (page 324).

| NOTE | The functions of the RC command are identical to the RCLS command (page 299). |

RCLS
Recall State

Syntax
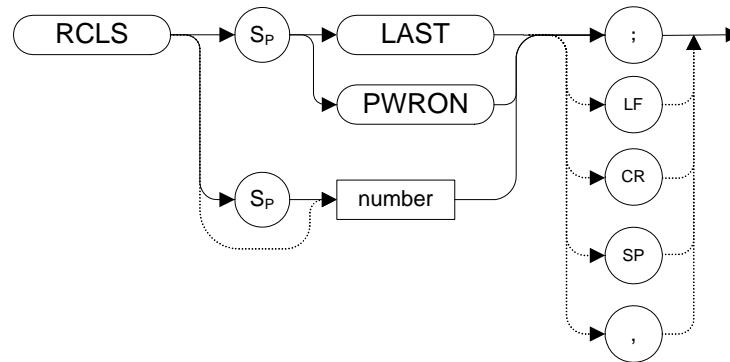
Legacy Products

8560 series, 8566A/B, 8568A/B

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 308) or the SV command (page 324).

NOTE	The functions of the RCLS command are identical to the RC command (page 298).

REV
Revision

Syntax
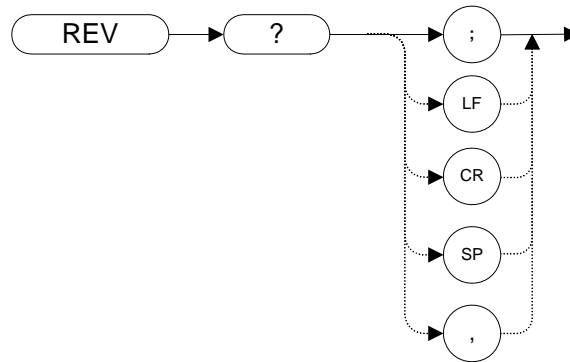
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The REV command returns the firmware revision number.

In X-Series analyzers, this command returns the build date of the N9061A application that you have installed in your analyzer. The date is returned in YYMMDD format (where YY is the number of years since 1950, and MM is the month and DD is the date).

RL
Reference Level

Syntax

8560 series:
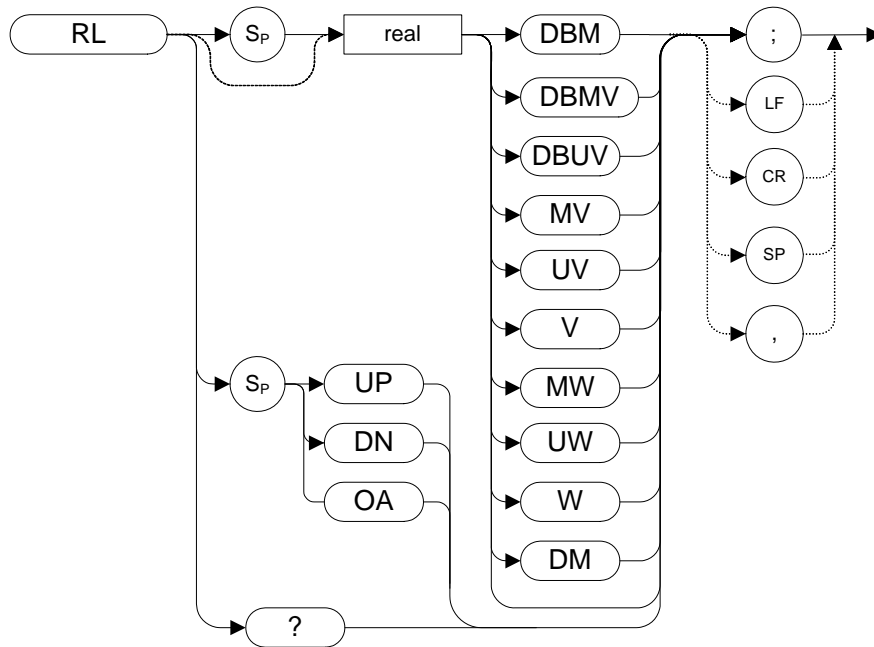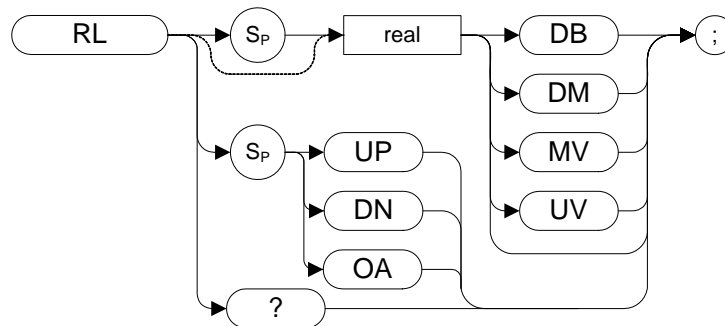
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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 analyzer. For a helpful suggestion on this subject, see Chapter 3 , "Hints and Tips," on page 71.

NOTE	The 8566A/B and 8568A/B have the reference level from -89.9 dBm to +30 dBm. The range of reference level for the MXA and PXA is -170 dBm to +30 dBm with 0 dB attanuation). The range of refernce level for EXA is -170 dBm to +23 dBm.

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

Syntax

```
RMS → Sₚ → TRA → ;
           TRB
           TRC
```
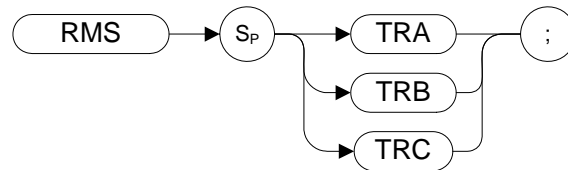
Legacy Products

8566A/B, 8568A/B

Description

The RMS command returns the RMS value of the trace, in display units.

ROFFSET
Reference Level Offset

Syntax

8560 series:
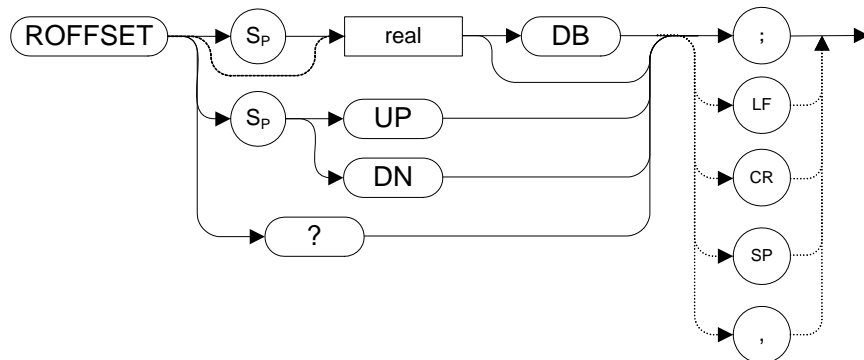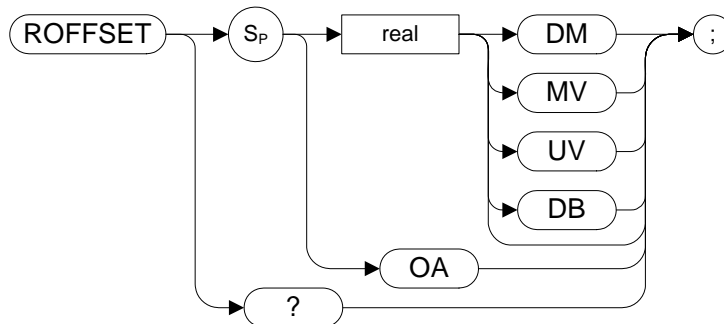
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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 analyzer eliminates an amplitude offset.

NOTE   For 8566A/B, 8568A/B, the functions of the ROFFSET command are identical to
                        the KSZ command (page 214).

RQS
Request Service Conditions

Syntax
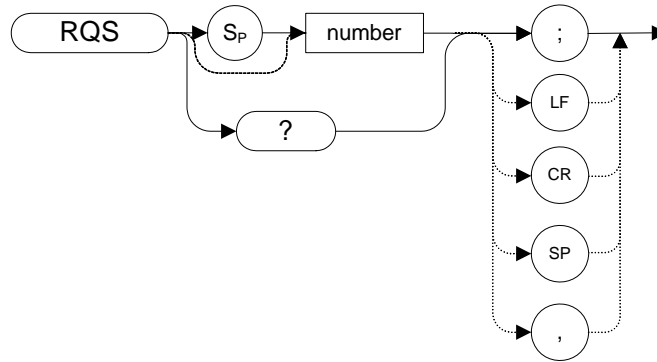
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Sets a bit mask for service requests, each service request has a corresponding bit number and decimal equivalent of that bit number as shown in the table below.Use the decimal equivalents to set the bit mask. For example, to set a mask for bits 4 and 5, add the decimal equivalents ($16 + 32 = 48$), then send the command RQS 48.

Table 4-26   Status Byte Definition

Bit#	State	Description
7		
6	RQS	Request Service
5	Error Present	
4	Command Complete	Any command completed.
3		
2	End of Sweep	Any sweep completed.
1	Message	Display message appears.
0	Trigger	Trigger activated.

S1[one]
Continuous Sweep

Syntax
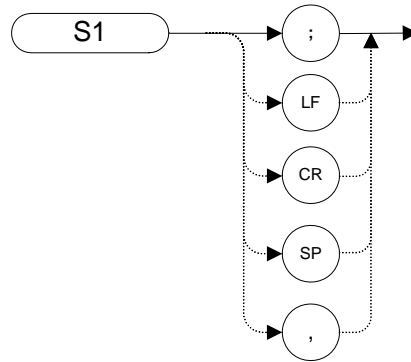
Legacy Products

8566A/B, 8568A/B

Description

The S1 command sets the analyzer to continuous sweep mode. In the continuous sweep mode, the 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 132).

S2 [two]
Single Sweep

Syntax
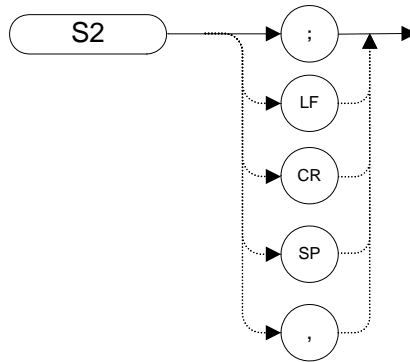
Legacy Products

8566A/B, 8568A/B

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 313). |

SAVES
Save State

Syntax
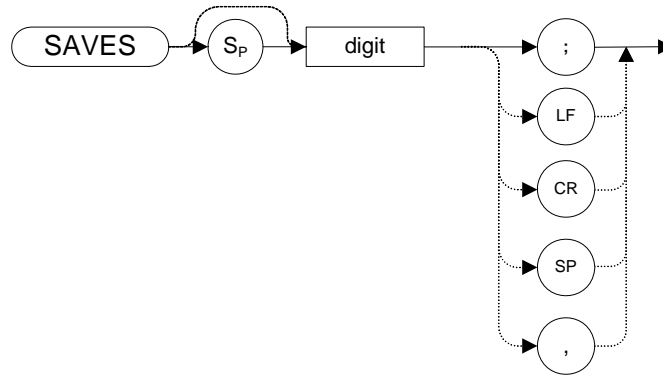
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

NOTE	The functions of the SAVES command are identical to the SV command (page 324).

SER
Serial Number

Syntax
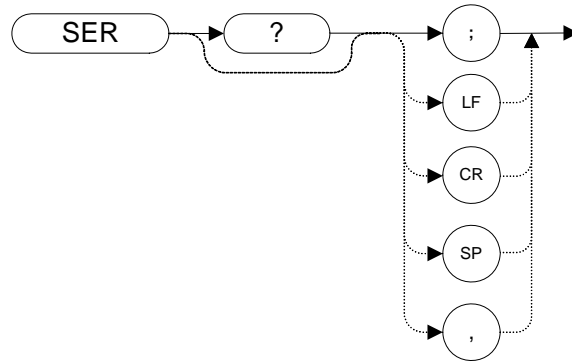
Legacy Products

8560 series

Description

The SER command returns the X-series analyzer serial number to the controller.

SETDATE
Set Date

Syntax
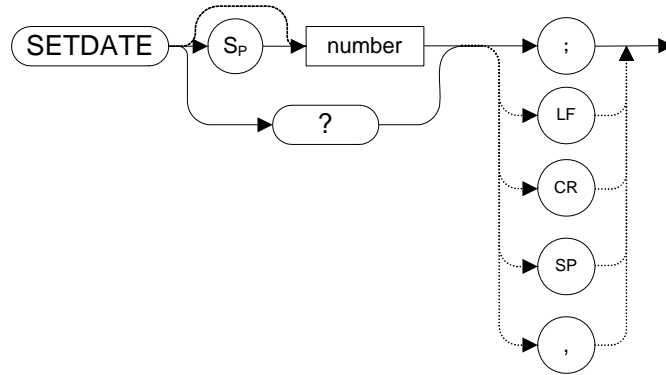
Legacy Products

8560 series

Description

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

SETTIME
Set Time

Syntax
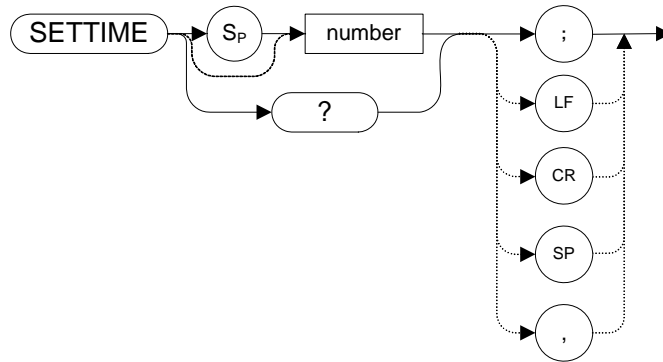
Legacy Products

8560 series

Description

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

SMOOTH
Smooth Trace

Syntax
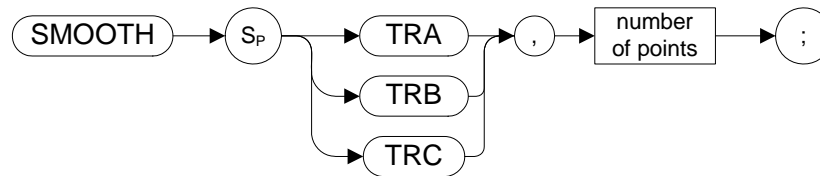
```
SMOOTH ──▶ Sᴘ ──▶ TRA ──▶ , ──▶ number of points ──▶ ;
              │──▶ TRB ──┘
              └──▶ TRC ──┘
```

Prerequisite Commands: TS when using trace data.

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

Legacy Products

8566A/B, 8568A/B

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 X-Series analyzers.

SNGLS
Single Sweep

Syntax
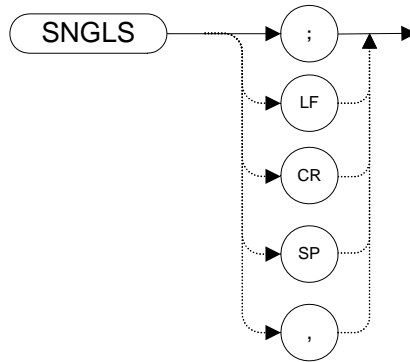
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Sets the 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 307).

SP
Frequency Span

Syntax

8560 series:
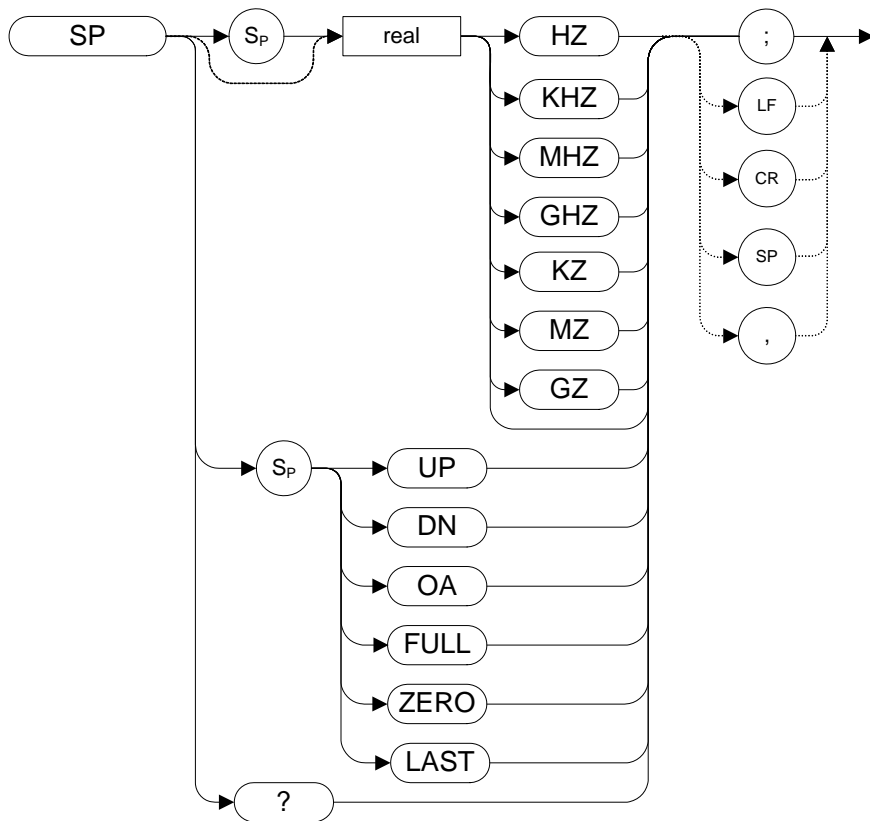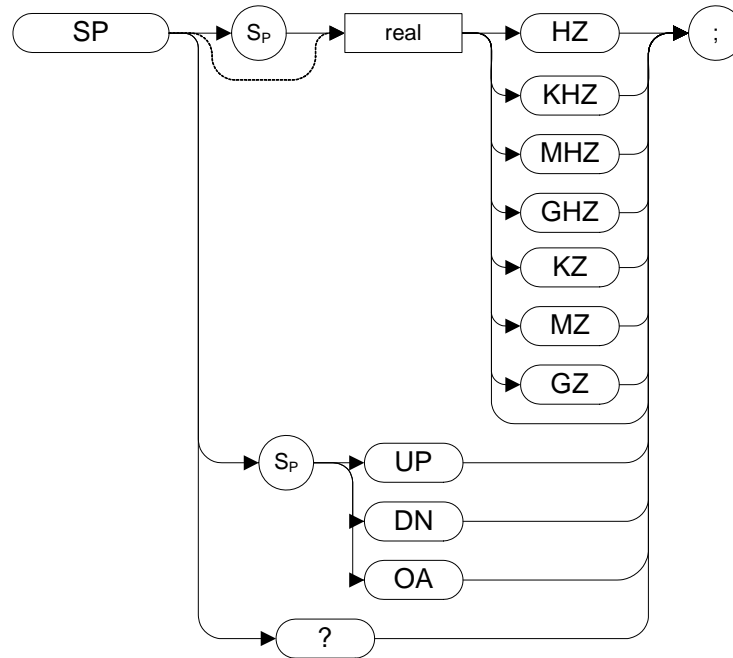
8566A/B, 8568A/B:

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

Legacy Products

8560 series, 8566A/B, 8568A/B

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 295), VB (page 347), or ST (page 318) have been executed.

SRQ
Service Request

Syntax
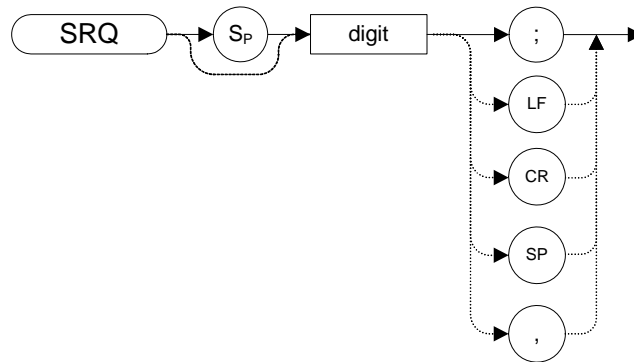
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

NOTE	The N9061A application 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.

SS
Center Frequency Step Size

Syntax

8560 series:
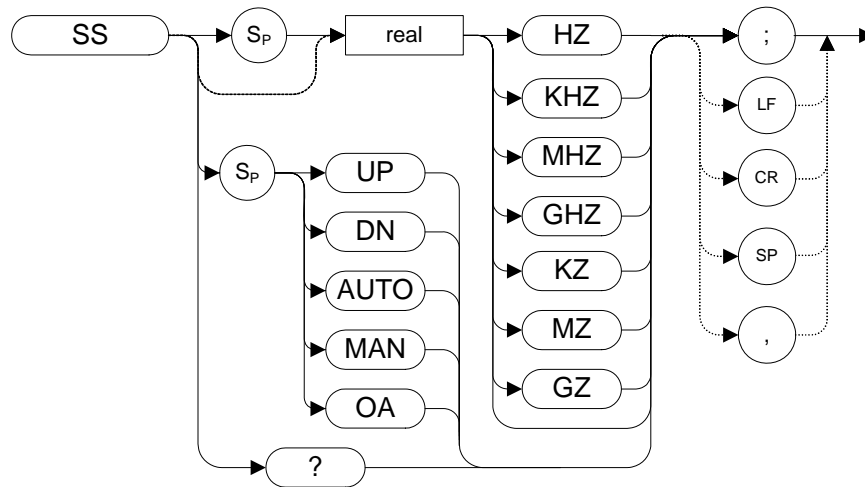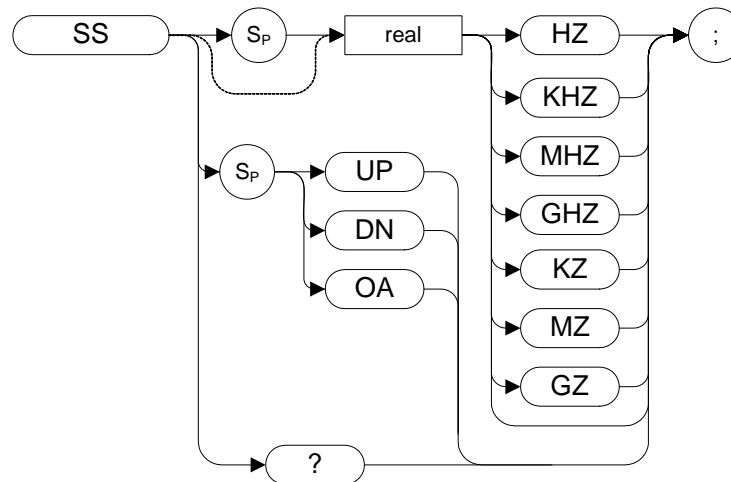
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The SS command specifies center frequency step size.

ST
Sweep Time

Syntax

8560 series:
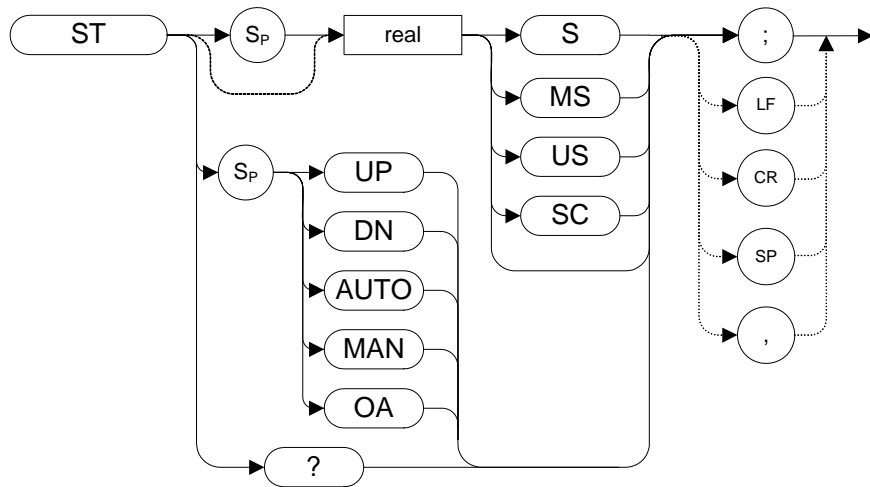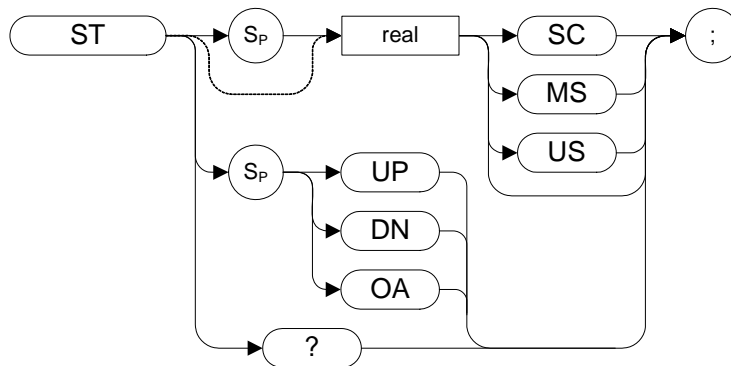
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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

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option does not set the active function to Sweep Time.

STB
Status Byte Query

Syntax
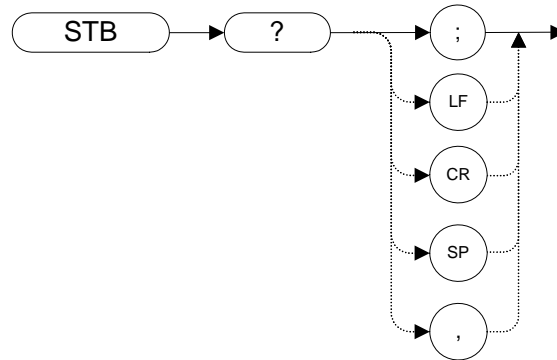
Legacy Products

8560 series

Description

The STB command returns to the controller the decimal equivalent of the bits set in the status byte (see the RQS (page 305) and SRQ (page 316) commands). STB is equivalent to a serial poll.

STDEV
Standard Deviation of Trace Amplitudes

Syntax
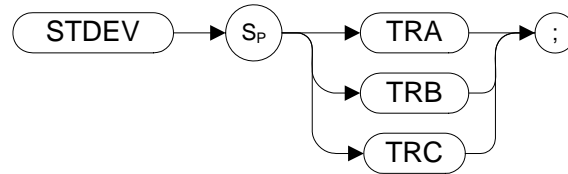
```
STDEV → SP → TRA → ;
              TRB
              TRC
```

Prerequisite Commands: TS when using trace data

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

Legacy Products

8566A/B, 8568A/B

Description

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

SUM
Sum

Syntax

8560 Series:
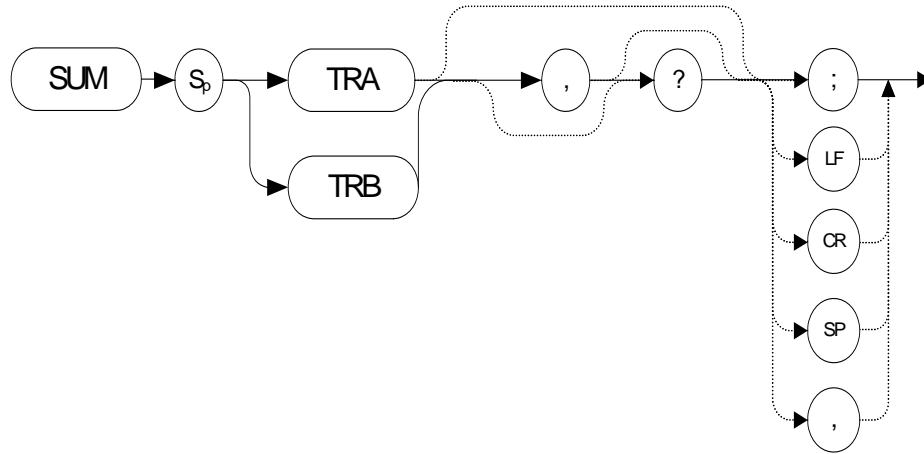
8566A/B, 8568A/B:
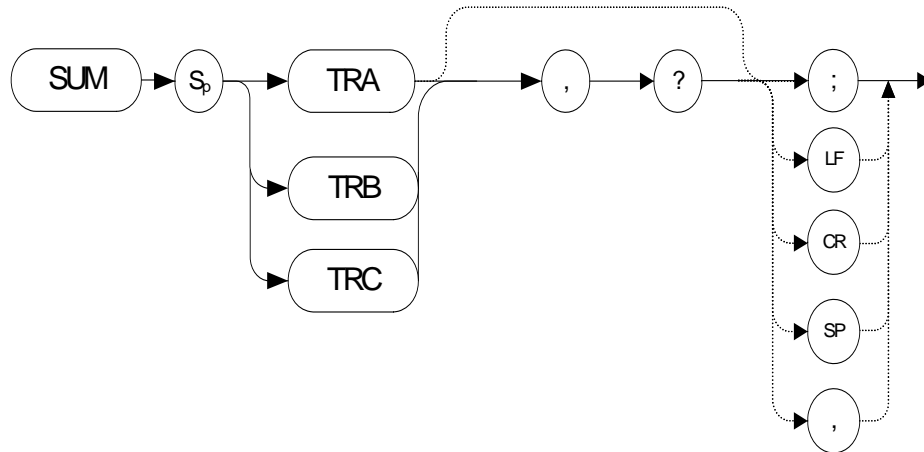
Legacy Products

8560 series

Description

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

NOTE	The 8560 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
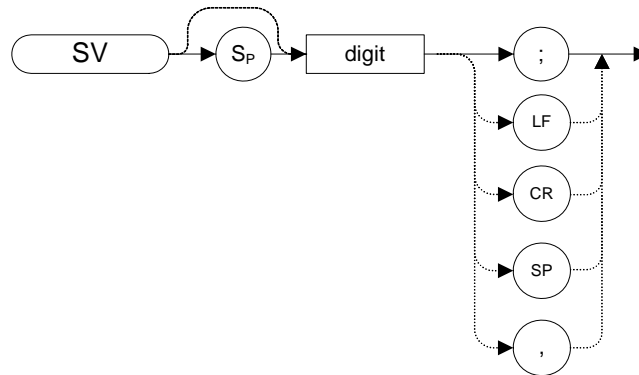
Legacy Products

8566A/B, 8568A/B

Description

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

NOTE	The functions of the SV command are identical to the SAVES command (page 308).

SWPCPL
Sweep Couple

Syntax
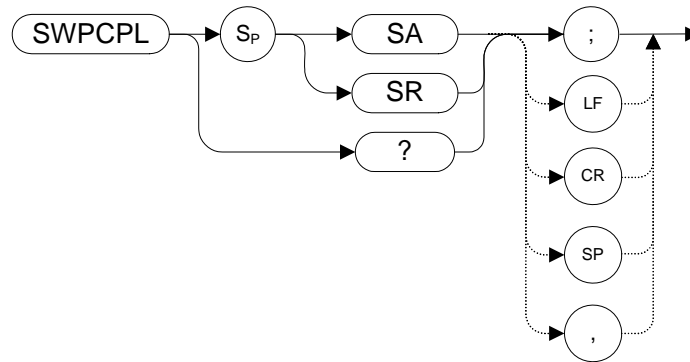
The preset value is SA.

Legacy Products

8560 series

Description

Selects either a stimulus-response (SR) or signal-analyzer (SA) auto-coupled sweep time. In stimulus response mode, auto-coupled sweep times are usually much faster for swept response measurements. Stimulus response auto-coupled sweep times are typically valid in stimulus-response measurements when the system frequency span is less than 20 times the bandwidth of the device under test.

T1 [one]
Free Run Trigger

Syntax
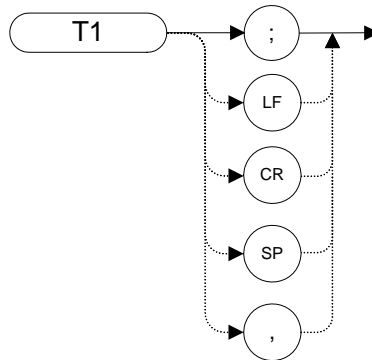
Legacy Products

8566A/B, 8568A/B

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 337).

T2 [two]
Line Trigger

Syntax
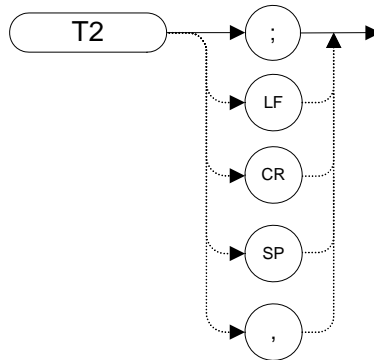
Legacy Products

8566A/B, 8568A/B

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 337).

T3 [three]
External Trigger
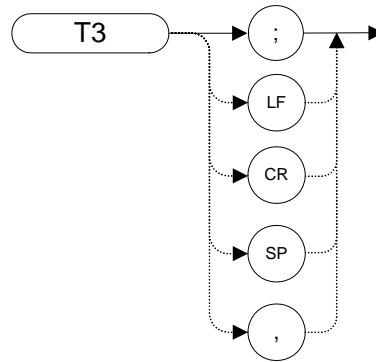
Syntax

Legacy Products

8566A/B, 8568A/B

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 337).

T4 [four]
Video Trigger

Syntax
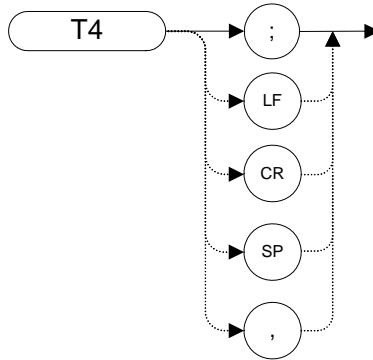
Legacy Products

8566A/B, 8568A/B

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 337).

TA
Trace A

Syntax
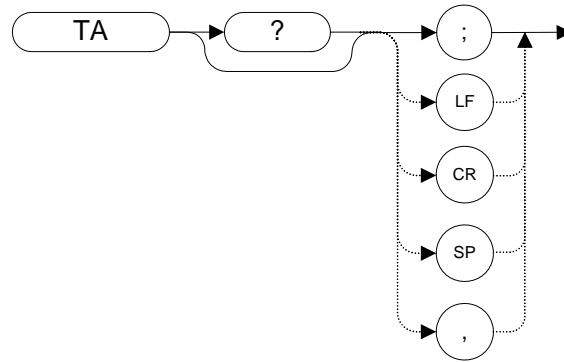
Legacy Products

8566A/B, 8568A/B

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 275), O2 **[two]** (page 276), O3 **[three]** (page 277) and O4 **[four]** commands (page 278).The format of the returned data is also affected by the TDF (Trace Data Format) (page 332) command and, if TDF B (binary data format) has been selected, by the MDS command (page 234).

TB
Trace B

Syntax
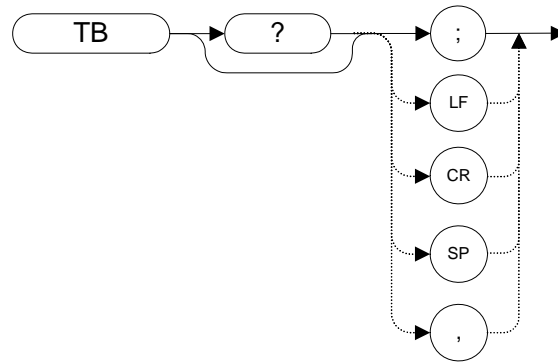
Legacy Products

8566A/B, 8568A/B

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 275), O2 **[two]** (page 276), O3 **[three]** (page 277) and O4 **[four]** commands (page 278). The format of the returned data is also affected by the TDF (Trace Data Format) (page 332) command and, if TDF B (binary data format) has been selected, by the MDS command (page 234).

TDF
Trace Data Format

Syntax
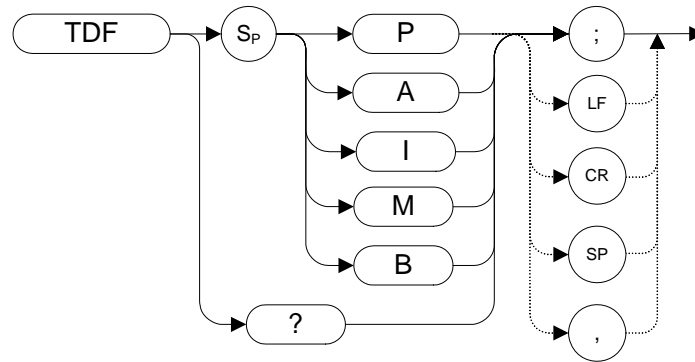
The preset value for TDF is P.

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Formats trace information for return to the controller.

The different trace data formats are as follows:

- M selects the ASCII data format.

- P selects parameter data format. Numbers are in Hz, Volts, Watts, dBm, dBmV, DBuV, DBV.

- 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 234))

- 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 234))

- B selects binary data format. The MDS command determines whether data comprises one or two 8-bit bytes

TH
Threshold

Syntax

8560 series:
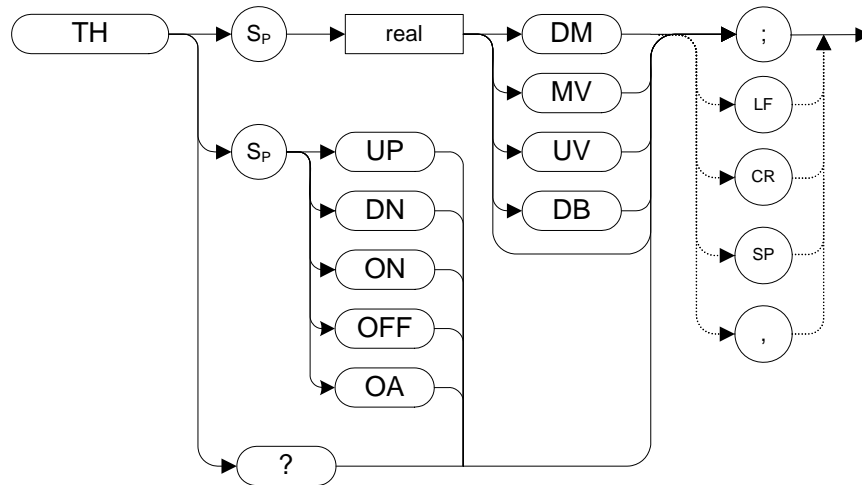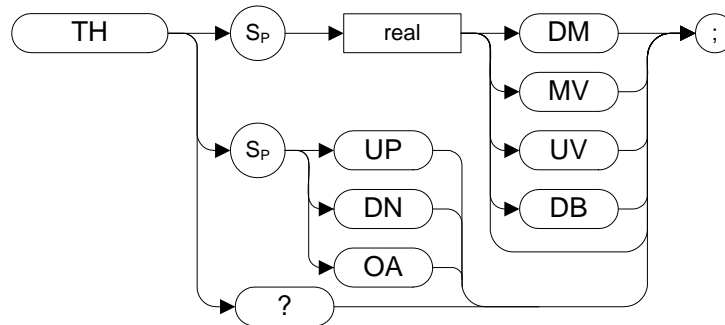
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

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.

THE
Threshold Enable

Syntax

```
THE  →  Sp  ───────────  →  ON  ──→  ;
              │                 →  OFF  ──┘
              └──→  ?  ─────────────┘
```
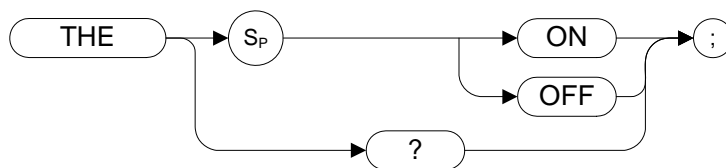
Legacy Products

8566A/B, 8568A/B

Description

Turns the threshold on or off.

TIMEDATE
Time Date

Syntax
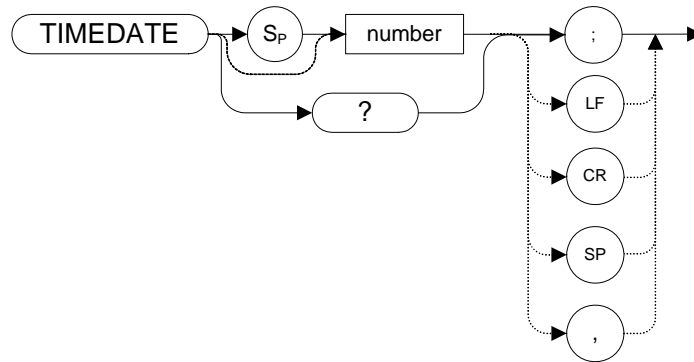
Legacy Products

8560 series

Description

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

TIMEDATE ON and TIMEDATE OFF commands are supported on some models of the 8560 series. This set of commands displays or hides the time and date in the graticule. The N9061A application on the X-series analyzers does not support these commands but accepts them and does not display a CMD ERR error or CMD NOT SUPPORTED error.

NOTE	This command changes the system clock of the instrument and may invalidate any time-based licenses installed on the instrument.

TITLE
Title

Syntax
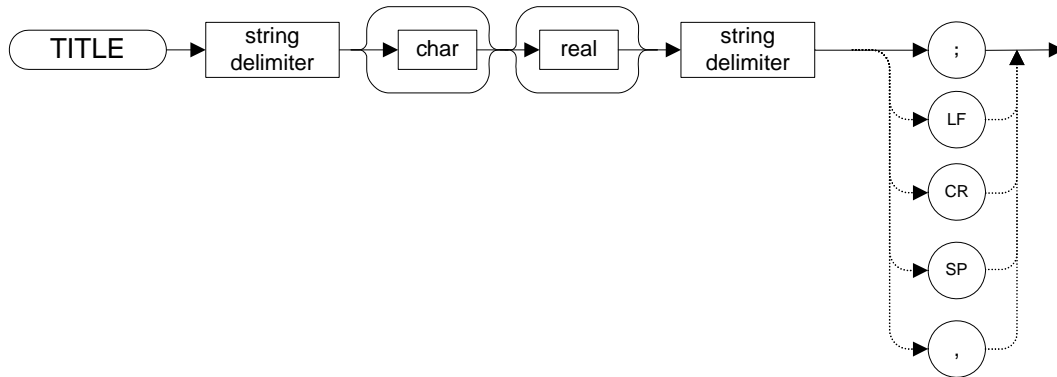
Legacy Products

8560 series

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. See 8560 Series User's Guide for more details.

- !
- "
- $
- %
- &
- '
- /
- :
- =
- \
- ~
- @

TM
Trigger Mode

Syntax
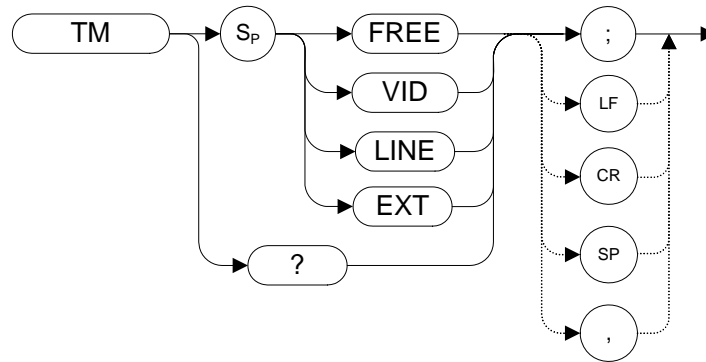
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

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

NOTE	The functions of the TM command are identical to the T1 (page 326), T2 (page 327), T3 (page 328) and T4 (page 329) commands.

TRA
Trace Data Input and Output

Syntax
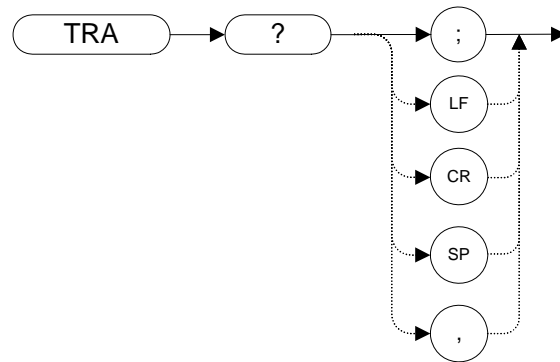
Legacy Products

8560 series, 8566A/B, 8568A/B

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 332) for details on formatting.

TRB
Trace Data Input and Output

Syntax

```
TRB  →  ?  →  ┌→  ;
              ├→  LF
              ├→  CR
              ├→  SP
              └→  ,
```
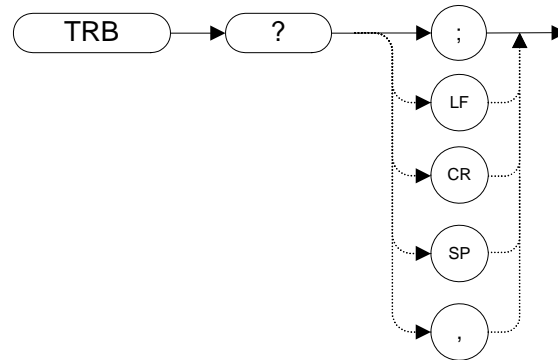
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

The TRB command transfers Trace B amplitude values between the analyzer and the controller. The format depends on the trace data format selected. See "TDF Trace Data Format" on page 332 for details on formatting.

TRC
Trace Data Input and Output

Syntax

TRC → ? → ;
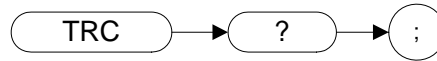
Legacy Products

8566A/B, 8568A/B

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 for details on formatting.

TRDSP
Trace Display

Syntax

```
TRDSP → Sp → TRA → , → ON → ;
             TRB   Sp  OFF
             TRC       1
                       0
                       ?
```
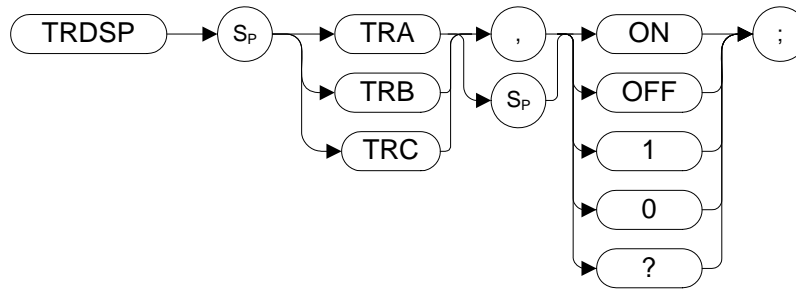
Legacy Products

8566A/B, 8568A/B

Description

Displays a trace or turns it off.

TRIGPOL
Trigger Polarity

Syntax
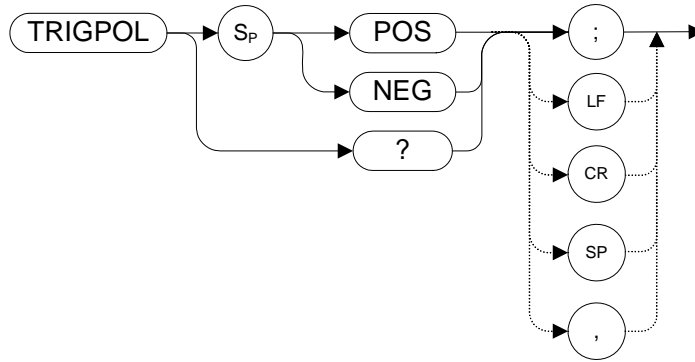
Legacy Products

8560 series

Description

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

TRSTAT
Trace State

Syntax
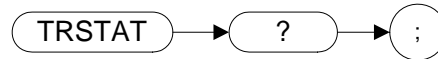
TRSTAT → ? → ;

Legacy Products

8566A/B, 8568A/B

Description

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

Table 4-27   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
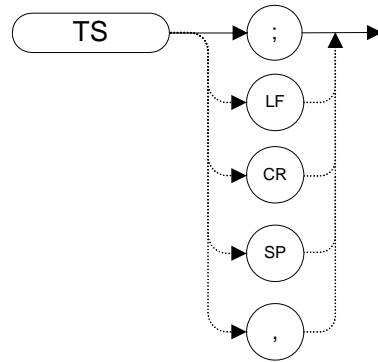
Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Starts and completes one full sweep before the next command is executed. A TS command is required for each sweep in the single-sweep mode. TS always restarts a sweep even if a sweep is already in progress.

VAVG
Video Average

Syntax

8560 series:
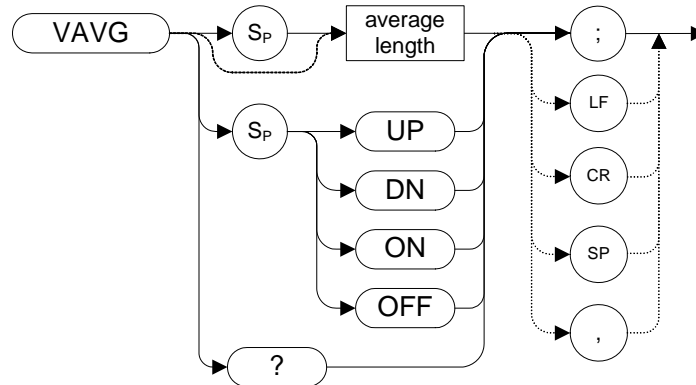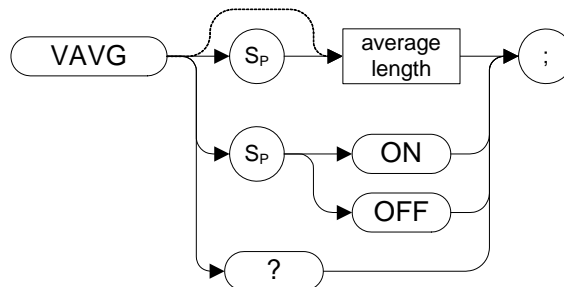
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Enables the video-averaging function, which averages trace points to smooth the displayed trace. When queried, the VAVG command returns the number of averages for the 8560 series of analyzers.

| NOTE | There are a few differences in the way video averaging works in the N9061A application compared to the legacy analyzers. See the following table for a summary of these differences. |

Table 4-28 **Legacy Analyzers - Video Averaging Behavioral Differences**

Condition	Legacy Spectrum Analyzers	N9061A application
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 the X-Series analyzer uses all stored averages. Does not reset the counter after changes in RBW, VBW, Sweep Time, Ref. Level and Attenuation.

| NOTE | For 8566A/B, 8568A/B, the functions of the VAVG command are identical to the KSG (page 193)or KSH command (page 195). |

VB
Video Bandwidth

Syntax
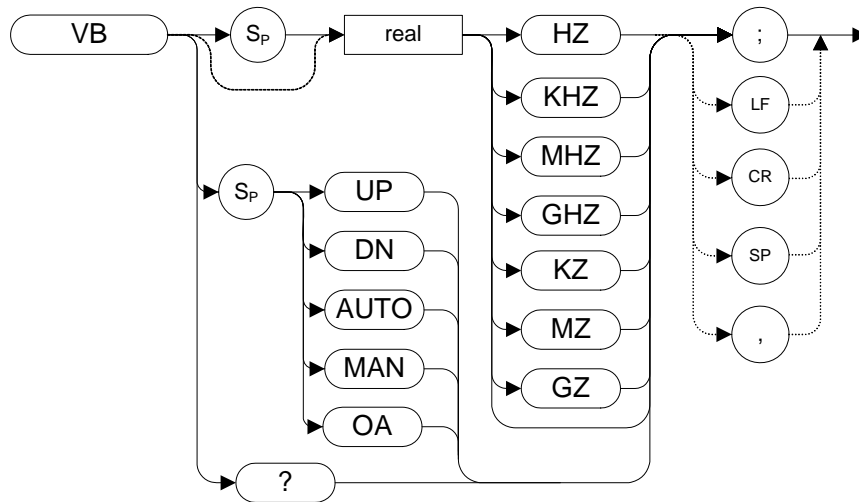
8560 series:
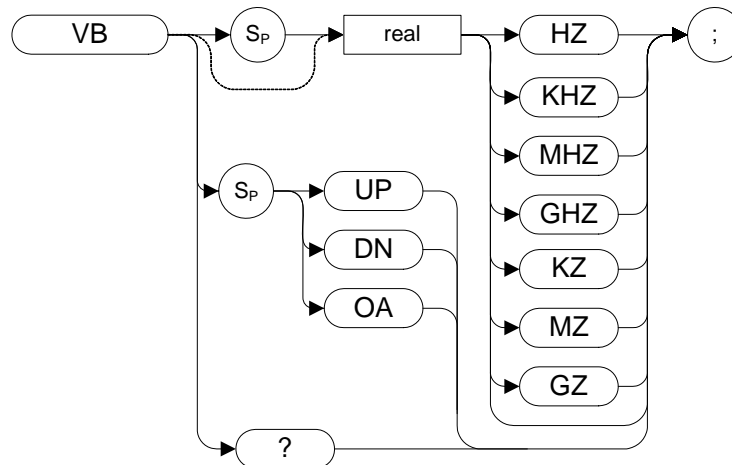
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Specifies the video bandwidth, which is a post-detection, low-pass filter.

When auto coupled, the video bandwidth is calculated as Resolution Bandwidth x Video Resolution Bandwidth Ratio. See the VBO command for more details.

VBO
Video Bandwidth Coupling Offset

Syntax
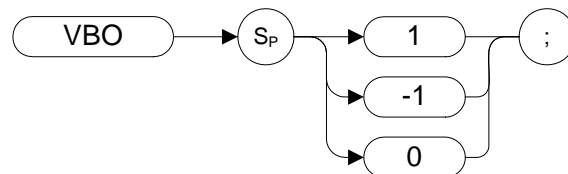
Legacy Products

8566A/B, 8568A/B

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 295) or VB command (page 347) 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.

VBR
Video Bandwidth to Resolution Bandwidth Ratio

Syntax
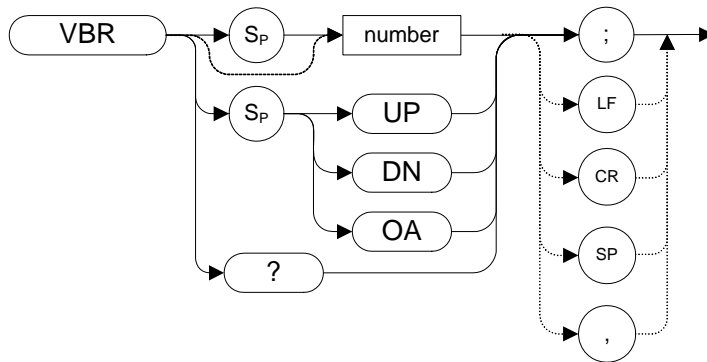
Legacy Products

8560 series

Description

The VBR command specifies the relationship between the video and resolution bandwidths that is maintained when these bandwidths are coupled.

NOTE	VBR uses the legacy signal analyzer settings for video bandwidth only if Mode Setup > Preferences> Limit RBW/VBW is set to ON.

VIEW
View Trace

Syntax

8560 series:
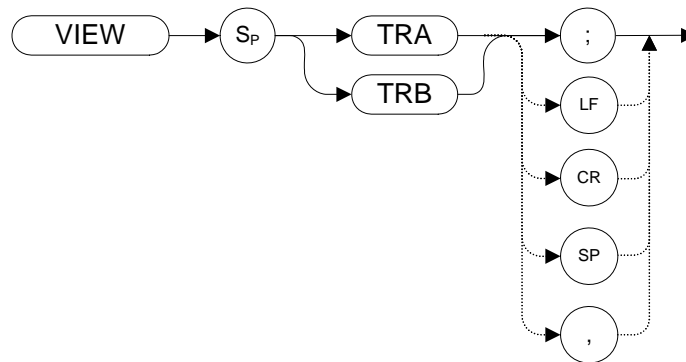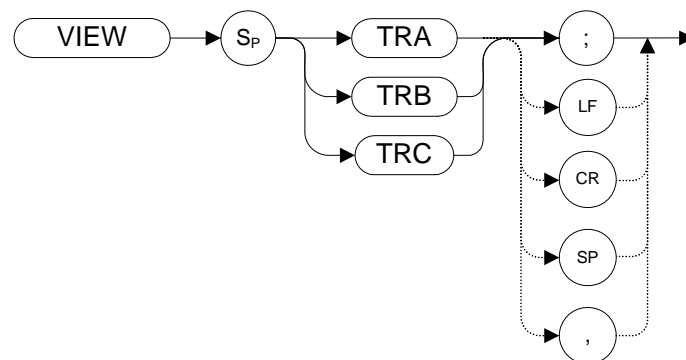
8566A/B, 8568A/B:

Legacy Products

8560 series, 8566A/B, 8568A/B

Description

Displays Trace A or Trace B and stops taking new data into the viewed trace.

NOTE   The functions of the VIEW command are identical to the A3 (page 81) and B3 (page 112) commands. For 8566A/B, 8568A/B, the VIEW command is also identical to KSj (page 198).

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

For information on the settings of the X-series analyzers when legacy instrument trace settings are sent, see Table 4-4, "Legacy Products command mapping to X-series for trace/detector settings."

VTL
Video Trigger Level

Syntax
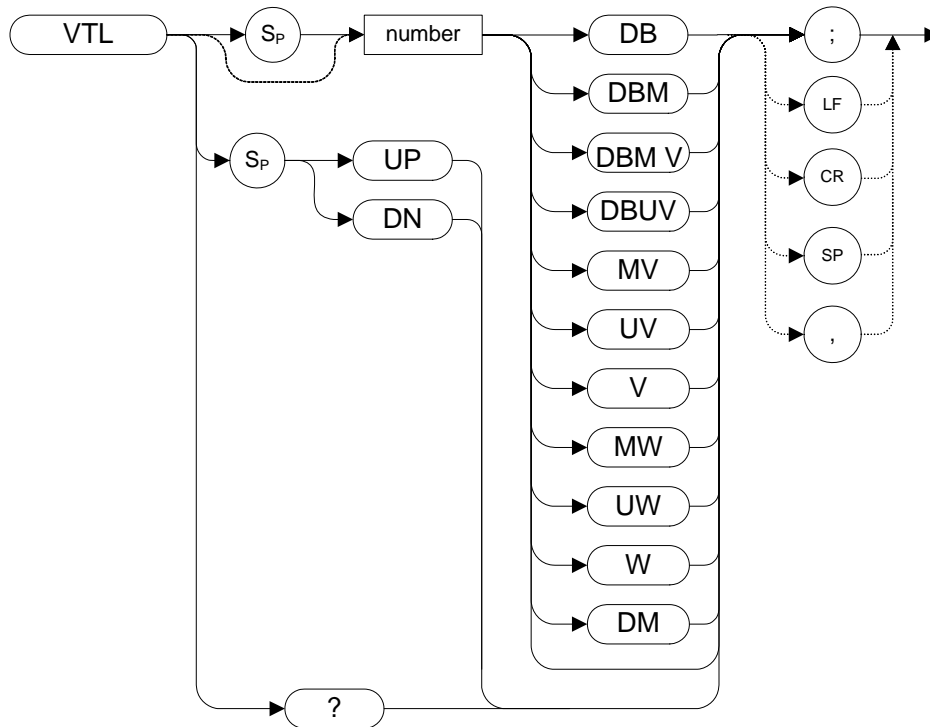
Legacy Products

8560 series

Description

The VTL command sets the signal level that triggers a sweep.

Note that setting a value for VTL sets the trigger mode to VIDEO, even if it was not already set to VIDEO. (See "TM Trigger Mode" on page 337).

XCH
Exchange

Syntax
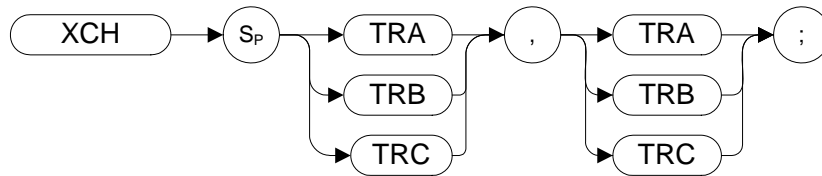
Legacy Products

8566A/B, 8568A/B

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 109) and EX (page 155) commands.
	The functions of the XCH TRB,TRC command are identical to the BXC (page 118) and KSi (page 197) commands.

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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:

For more information refer to:

IEEE Standard 488.1-2004, *IEEE Standard Digital Interface for Programmable Instrumentation.* New York, NY, 1998.

IEEE Standard 488.2-2004, *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:

Command Syntax	Sample Valid Commands
`[SENSe:]BANDwidth[:RESolution] <freq>`	The following sample commands are all identical. They 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`
`MEASure:SPECtrum[n]?`	• `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.
`[:SENSe]:DETector[:FUNCtion]` `NEGative|POSitive|SAMPle`	• `DET:FUNC neg` • `Detector:Func Pos`
`INITiate:CONTinuous ON|OFF|1|0`	The sample commands below are identical. • `INIT:CONT ON` • `init:continuous 1`

Special Characters in Commands

Special Character	Meaning	Example

|	A vertical stroke between **parameters** indicates alternative choices. The effect of the command is different depending on which parameter is selected.	Command:
		`TRIGger:SOURce`
		`EXTernal|INTernal|LINE`
		
		The choices are external, internal, and line.
		Ex: `TRIG:SOURCE INT`
		
		is one possible command choice.

Special Character	Meaning	Example
	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.	Command: `SENSe:BANDwidth|BWIDth: OFFSet` Two identical commands are: Ex1: `SENSE:BWIDTH:OFFSET` Ex2: `SENSE:BAND:OFFSET`
[ ]	keywords in square brackets are optional when composing the command. These implied keywords are executed even if they are omitted.	Command: `[SENSe:]BANDwidth[:RESolu tion]:AUTO` The following commands are all valid and have identical effects: Ex1: `bandwidth:auto` Ex2: `band:resolution:auto` Ex3: `sense:bandwidth:auto`
< >	Angle brackets around a word, or words, indicates they are not to be used literally in the command. They represent the needed item.	Command: `SENS:FREQ <freq>` In this command example the word <freq> should be replaced by an actual frequency. Ex: `SENS:FREQ 9.7MHz`.
{ }	Parameters in braces can optionally be used in the command either not at all, once, or several times.	Command: `MEASure:BW <freq>{,level}` A valid command is: `meas:BW 6 MHz, 3 dB, 60 dB`

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 are 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, µV, nV
<current>	Is a rational number followed by optional units. The default units are Amperes. Acceptable units include: A, mA, µA, nA.
<power>	Is a rational number followed by optional units. The default units are W. Acceptable units include: mAW, kW, W, mW, µW, nW, pW.
<ampl>	Is a rational number followed by optional units. The default units are dBm. Acceptable units include: dBm, dBmV, dBµV.
<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, #Oddddd or #oddddd where 'd' represents an octal digit 0 to 7. So #o24 can be used instead of the decimal number 20.
- Binary, #Bddddddddddddddd or #bddddddddddddddd 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 do not get block data if your data type is ASCII, using FORMat:DATA ASCII command. Your data is 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?`
: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.	

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