

Keysight X-Series Signal Analyzers

This manual provides documentation for the following Analyzers:

PXA Signal Analyzer N9030A
MXA Signal Analyzer N9020A
EXA Signal Analyzer N9010A
relating to
HP/Agilent 859x series
HP/Agilent 856x series
HP 8566A/B, 8568A/B

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X-Series
Programming
Conversion
Guide

Notices

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1 Programming Conversion Guide

About this Guide

This document helps programmers convert HP/Agilent spectrum analyzer remote control code to the SCPI code that is used for remote control of the Agilent X-series signal analyzers. It compares the remote programming commands of your Agilent X-series signal analyzer with the HP/Agilent 8590-Series, HP 8566A/B, HP 8568A/B, and HP/Agilent 8560E/EC-Series spectrum analyzers.

In the command tables in this book, the information in the description/comments column is “aligned” horizontally with the command(s) to which it applies.

There may be more than one SCPI command that applies to any given command. In these cases, the SCPI commands are listed one after the other in the fourth column of the table.

As an example, there is no X-series SCPI command that corresponds to the HP/Agilent 8590-Series command CAL, and the description of CAL is given in column 5; the CAL ALL command has an associated SCPI command, shown in the fourth column, with comments about the SCPI command in the fifth column; CAL ON/OFF has two SCPI commands that are related, and no comments are given for those commands.

NOTE In the following tables the table entries for the commands which are supported by the Remote Language Compatibility application (N9061A) in X-Series signal analyzers are highlighted in green.

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SCPI Output Format

The Agilent X-series signal analyzers return data in NR3 format as described in IEEE Std 488.2-1992. Response terminators may be different than other HP/Agilent spectrum analyzer terminators. For example, note the following differences:

- Non-block response termination in the HP/Agilent 8590-Series and 8560E/EC-Series analyzers is <CR><LF>. In the HP 8566A/B and HP 8568A/B analyzers the non-block termination is <CR><LF><EOI>, but in the Agilent X-series analyzers it is <LF><EOI>.
- Boolean queries in HP/Agilent 8590-Series, 8566A/B, and 8568A/B analyzers return ON or OFF, whereas boolean queries in HP/Agilent 8560E/EC-Series and Agilent X-series analyzers return 1 or 0.
- EP is a valid parameter for many HP/Agilent 8590-Series, HP/Agilent 8560E/EC-Series, and HP 8566B/68B spectrum analyzer commands, but is not valid for the Agilent X-series analyzer SCPI commands.
- OA is a valid parameter for many HP/Agilent 8590-Series and 8560E/EC-Series spectrum analyzer commands, but is not valid for Agilent X-series analyzer SCPI commands.

A

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|---|--|
| | A1 | A1 | | Same as CLRW TRA (see Page 45) |
| | A2 | A2 | | Same as MXMH TRA (see Page 93) |
| | A3 | A3 | | Same as VIEW TRA (see Page 127) |
| | A4 | A4 | | Same as BLANK TRA (see Page 41) |
| ABORT | | ABORT ^a | :ABORt | The ABORT command stops the execution of all user-defined functions and readies the instrument for the next command received. The SCPI command is used to stop the current measurment. |
| ABS | ABS | ABS ^a | | Places the absolute value of the source values in the destination. |
| ACP | | ACPMEAS | :MEASure:ACP? | Performs the adjacent channel power measurement. The legacy commands (ACP and ACPMEAS) initiate an ACP measurement, whereas the SCPI command initiates a measurement and returns the measurement results. |
| | | ACPACCL | | Sets the adjacent channel power measurement speed to normal, faster, fastest. |
| | | ACPALPHA | [:SENSe]:ACPower:FILTer[:RRC]:ALPHA <number> | Sets the adjacent channel power measurement alpha weighting. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|---|---|---|
| | | ACPALTCH | [[:SENSe]:ACPower:OFFSet:[1]]2 3:LIST:STATe ON OFF 0 1 | Sets the number of adjacent channel pairs to be measured for an ACP measurement. The X-series SCPI command allows you to activate or deactivate each offset. The 856x E/EC command allowed only three offsets to be measured (the adjacent channels and up to two alternate channels). The MXA/EXA SCPI command allows up to six offsets to be measured. |
| | | ACPBRRPER | | Sets the cycle time of the burst signal when making an ACP measurement. |
| | | ACPBRRWID | | Sets the burst width for a gated method ACP measurement. |
| ACPBW ACPBW? | | ACPBW ACPBW? | [[:SENSe]:ACP:BANDwidth BWIDTH:INTEgration <freq> [:SENSe]:CHPower:BANDwidth BWIDTH:INTEgration <freq> [:SENSe]:ACP:BANDwidth BWIDTH:INTEgration? [:SENSe]:CHPower:BANDwidth BWIDTH:INTEgration? | Allows you to specify the channel bandwidth used for the adjacent channel power (ACP), extended ACP (EACP), and for the channel power (CHP) measurement. |

b. No equivalent command for 8568B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|--|--|
| | | ACPCOMPUTE | MEASure:ACP? | Performs the adjacent channel power computation on the designated signal without changing any instrument state settings. Performs an ACP measurement and returns the results defined by the current measurement setup selections. |
| ACPCONTM | | | | Changes the spectrum analyzer sweep mode to continuous sweep, and then performs the previous power measurement (occupied bandwidth, adjacent channel, or channel power) at the end of every sweep. |
| | | | :INITiate:CONTinuous ON 1 | Sets the analyzer to continuous sweep mode (or continuous measurement). |
| ACPE | | | | Performs the adjacent channel power extended measurement. |
| | | ACPFROWT | [:SENSe]:ACP:FILTer[:RRC]:STATe OFF ON 0 1 | Sets the frequency weighting for ACP measurements. |
| ACPGR | | | :DISPlay:ACPower:VIEW[1]:WINDow[1]:BGRaph ON OFF 0 1 | Determines if the adjacent channel power (ACP) graph function is enabled or disabled. The X-series SCPI command activates or deactivates the bar graph display, which graphically displays the power in each channel. |
| ACPGGRAPH | | ACPGGRAPH | :DISPlay:ACPower:VIEW[1]:WINDow[1]:BGRaph ON OFF 0 1 | Computes and displays an adjacent channel power (ACP) graph. The X-series SCPI command activates or deactivates the bar graph display, which graphically displays the power in each channel. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|--|---|--|
| | | ACPLOWER? | FETCH:ACP? | Returns the power ratio result of the ACP measurement for the lower frequency channel. Returns several power results of the ACP measurement that is currently available. |
| | | ACPMAX? | FETCH:ACP? | Returns the highest adjacent power result for the ACP measurement. Returns several power results of the ACP measurement that is currently available. |
| | | ACPMETHOD | | Selects the measurement method to be used for making ACP measurements. |
| ACPMK | | | | Determines if the graph marker function is enabled or disabled for the adjacent channel power (ACP) graph. |
| | | ACPMSTATE CURR DFLT ACPMSTATE? ACPMSTATE? | MEASure:ACP? READ:ACP? | Sets the ACP measurement state to a default or to the current state. Sets the ACP measurement state to a default state, measures, and returns values. If ACP measurement is already running and the default state is changed, READ makes a new measurement and returns values. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|--|---|
| ACPPAR | | | | Determines if the spectrum analyzer settings used for the adjacent channel power (ACP), extended adjacent channel power (ACPE), channel power (CHP), or occupied bandwidth (OBW) measurement are set manually or automatically. |
| | | ACPPWRTX? | | Returns the power result of the ACP measurement for the main channel transmit power. |
| | | | FETCH:ACP? | Returns several power results of the ACP measurement that is currently available. |
| | | ACPRSLTS? | FETCH:ACP? | Returns an array of ACP measurement data. The number values returned depends on measurement method and the number of alternate channels. Returns several power results of the ACP measurement that is currently available. |
| ACPSNGLM | | | :INITiate:CONTinuous OFF 0; :INITiate:IMMediate | Changes the spectrum analyzer sweep mode to single sweep, performs a take sweep (TS), and then performs the previous power measurement. Sets the analyzer to single sweep mode (or single measurement). |
| ACPSP | | ACPSP | [:SENSe]:ACPower:CARRier [1] 2:LIST:WIDTh <bandwidth>, ... | Allows you to specify the frequency spacing between channels. |
| | | ACPT | | Sets the T weighting for ACP measurements. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|---|---|
| | | ACPUPPER? | FETCH:ACP? | Returns the power ratio result of the ACP measurement for the upper frequency channel. Returns several power results of the ACP measurement that is currently available. |
| ACTDEF | | | | Creates a user-defined active function. |
| | | ACTVFUNC ^a | | Makes a user-defined function operate like an active function. |
| ACTVF | | | | Returns a "0" if the given function is not active, a "1" if it is active. |
| ADD | ADD | ADD ^a | | Adds the sources and sends the sum to the destination. |
| CAL ALL | | ADJALL | :CALibration:[ALL] | Immediately runs all the self-alignment routines. |
| | | ADJCRT | | Turns on CRT adjustment patterns. |
| | | ADJIF | :CALibration:NRF | Activates constant IF self-alignment routines. |
| AMB | AMB | AMB | | Subtracts trace B from trace A and sends the result to trace A during every sweep of the spectrum analyzer. |
| AMBPL | AMBPL | AMBPL | | Subtracts trace B from trace A, adds the display line value to the difference, and sends the result to trace A during every sweep of the spectrum analyzer. |
| AMPCOR | | AMPCOR | | Applies amplitude correction at specified frequencies. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|------------------------------------|--|---|---|
| AMPCOR <values> AMPCOR OFF ON | | AMPCORDATA {<freq>, <amp>} AMPCOR OFF ON | | Units and spaces are not allowed in SCPI. The separator must be a comma (,) and the terminator must be a semicolon (;). Frequency and amplitude values must be entered in Hz and dB. |
| AMPCOR? | | AMPCORDATA? | | The data format for the command and query is always TDF P (in 856x and 859x), with data in frequency/amplitude pairs of the format: 12000000, -57.71, 12133333, -56.87. The Agilent X-series analyzer returns data in the format: 1.20000000E+007, -5.77100000E+001, 1.21333333E+007, -5.68700000E+001. This is an example of IEEE NR3 numeric response data. |
| | | AMPCORRCL AMPCORSAVE | | Saves and recalls (to instrument memory) a table of amplitude/frequency correction pairs identified by a register number. |
| AMPLN | | AMPCORSIZE? | | Returns the number of frequency-amplitude correction factors that have been entered. |
| ANLGPLUS | | | | Turns the Analog+ display mode on or off. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|-------------------------------------|--|--|---|
| ANNOT ANNOT ON OFF ANNOT? | ANNOT ANNOT ON OFF ANNOT? | ANNOT ANNOT ON OFF ANNOT? | :DISPlay:WINDow:ANNotation[:ALL] OFF ON 0 1 :DISPlay:WINDow:ANNotation[:ALL]? | Turns the screen annotation on or off. The HP/Agilent 8590-Series and 8566B/8568B analyzers return ON or OFF. The HP/Agilent 8560E/EC series analyzers and the Agilent X-series analyzers return 1 or 0. |
| APB | APB | APB | | Adds trace A to trace B and sends the result to trace A. |
| | | ARRAYDEF ^a | | Allows you to create user-defined arrays. |
| AT AT <value> AT AUTO AT UP DN AT? | AT AT <value> AT UP DN AT? | AT AT <integer> AT AUTO AT UP DN AT? | :SENSe:POWer[:RF]:ATTenuation <rel_ampl> :SENSe:POWer[:RF]:ATTenuation: AUTO ON 1 :SENSe:POWer[:RF]:ATTenuation? | Specifies RF input attenuation. The up/down steps are in 2 dB increments. The up/down steps are in 2 dB increments. |
| AUNITS AUNITS? | AUNITS AUNITS? | AUNITS AUNITS? | :UNIT:POWer DBM DBMV DBUV V W :UNIT:POWer? | Specifies amplitude units for the input, output, and display. Specifies amplitude units for the input, output, and display for the active window. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|---|--|
| AUTO AUTO | | AUTOCPLe AUTOCPLe | :COUPLe ALL NONE | Couples the active functions automatically. The instrument can automatically couple instrument settings together for accurate measurements and optimum range. This command is used to override the coupling for special measurement needs. The NONE parameter applies only to the SCPI language. |
| | | AUTOEXEC ^a | | Turns on/off the automatic function as defined with the AUTOFUNC command. |
| | | AUTOFUNC ^a | | Specifies an operation/function for automatic execution. |
| | | AUTOSAVE ^a | | Turns on/off the function to automatically save traces as defined by the AUTOFUNC command. |
| AVG | AVG | AVG ^a | | Averages trace data. |
| AXB | AXB | AXB | :TRACe:EXCHange TRACE1, TRACE2 | Exchanges trace A and trace B. Exchanges TRACE1 (trace A) and TRACE2 (trace B), point by point. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

B

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer Series Analyzers SCPI Commands | Description/Comments |
|--|--|-------------------------------------|--|---|
| | B1 | B1 | | Same as CLRW TRB (see Page 45) |
| | B2 | B2 | | Same as MXMH TRB (see Page 93) |
| | B3 | B3 | | Same as VIEW TRB (see Page 127) |
| | B4 | B4 | | Same as BLANK TRB (see Page 41) |
| BAUDRATE BAUDRATE? | | | | Specifies the baud rate of a spectrum analyzer with the RS-232 interface option (Option 1AX) installed. |
| BIT | | | | Returns the state of a bit. |
| BITF | | | | Returns the state of a bit. |
| BLANK BLANK TRA BLANK TRB BLANK TRC | BLANK BLANK TRA BLANK TRB BLANK TRC | BLANK BLANK TRA BLANK TRB | :TRACe[1] 2 3:MODE BLANK | Blanks trace A, trace B, or trace C and stops taking new data into the specified trace. Selects the blank display mode for the selected trace. TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C. The blank display mode turns off the trace data so that it is not viewed on the display. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer Series Analyzers SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| BML | BL or BML | BML | | Subtracts display line from trace B and places the result in trace B. |
| | BRD | | | Reads the two-byte word at the analyzer's internal I/O bus, at the specified address. |
| BTC | BTC | | :TRACe:COPI TRACE2, TRACE3 | Transfers trace B into trace C. Transfers TRACE2 (trace B) into TRACE3 (trace C). |
| | BWR | | | Writes a two-byte word to the analyzer's internal I/O bus, at the specified address. |
| BXC | BXC | | :TRACe:EXCHange TRACE2, TRACE3 | Exchanges trace B and trace C. Exchanges TRACE2 (trace B) into TRACE3 (trace C). |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

C

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|------------------------------------|-----------------------------------|---|---|
| | C1 | C1 | | Same as AMB OFF (see Page 37) |
| | C2 | C2 | | Same as AMB ON (see Page 37) |
| | CA | CA | | Same as AT AUTO (see Page 39) |
| CAL CAL ALL CAL AMP CAL ON/OFF CAL TG CAL YTF CAL INIT CAL FREQ | | ADJALL | :CALibration:[ALL] :CALibration:AUTO OFF ON PARTial ALERT :CALibration:YTF :CALibration:DATA:DEFault | Initiates self-alignment routines. Immediately runs all the self-alignment routines. The alert setting is the same as off except that the instrument prompts you with a message when it needs an alignment. |
| | | CARDLOAD ^a | | Copies the specified data from the memory card to the module battery-backed memory. |
| | | CARDSTORE ^a | | Copies the specified data from the module memory to the memory card. |
| | | CARROFF | | Measures the carrier power when the burst is turned off. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------------|-------------------------------------|-------------------------------------|--|--|
| | | CARRON | | Measures the average power of the carrier while the burst is turned on. |
| CAT | | CATALOG ^a | :MMEMory:CATalog? <drive> | Displays/returns directory information from either the specified or current mass storage device. Lists all files in the current directory. <msus> is the mass storage device. The return data will be of the format: <mem_used>, <mem_free> {<file_listing>}, where <file_listing> is of the format: <file_name>, <file_type>, <file_size>. |
| CF CF <value> CF UP DN CF? | CF CF <value> CF UP DN CF? | CF CF <value> CF UP DN CF? | [[:SENSe]:FREQuency:CENTer <freq> [[:SENSe]:FREQuency:CENTer? | Specifies center frequency. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent X-series analyzer outputs data in the format: 7.50000000E+08. |
| | | CHANNEL UP DN | | Changes the center frequency by one channel width. |
| CHP | | CHANPWR TRA TRB CHANPWR? | MEASure:CHPower? | Performs the channel power measurement. Performs the channel power measurement on the identified trace data. Performs the channel power measurement and returns two scalar results. |
| | | CHPWRBW | [[:SENSe]:CHPower:BANDwidth BWIDth:INTEgration <freq> | Sets the channel power bandwidth. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| CHPGR | | | :DISPlay:CHPower:VIEW[1]:WINDow[1]:BGRaph ON OFF 0 1 | Determines if the channel power graph function is enabled or disabled. The X-series SCPI command activates or deactivates the bar graph display, which graphically displays the power in the channel. |
| CLRAVG | CLRAVG | | [[:SENSe]:AVERage:CLEar | Restarts video averaging. Re-start the trace averaging function. |
| CLRBOX | | | | Clears a rectangular area on the spectrum analyzer display. |
| CLRDSP | EM | CLRDSP ^a | | Erases user-generated graphics and text. |
| | | CLRSCHED ^a | | Clears the Autosave/Autoexec schedule. |
| CLRW | CLRW | CLRW | | Clears the specified trace and enables trace data acquisition. |
| CLRW TRA TRB TRC | CLRW TRA TRB TRC | CLRW TRA TRB | :TRACe[1] 2 3:MODE WRITe | TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C. |
| CLS | | | *CLS | Clears all status bits. The status bits do not map exactly. |
| CMDERRO | | | :SYSTem:ERRor[:NEXT] | Queries of error queue and clears the errors. Queries the first (earliest) error in the queue and clears that error. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| CNF | | | | Internal confidence test that does a brief test of some of the hardware. |
| CNTLA | | CNTLA ^a | | Sets the control line A of the auxiliary interface high or low. The Agilent X-series signal analyzers do not have an auxiliary interface. |
| CNTLB | | CNTLB ^a | | Sets the control line B of the auxiliary interface high or low. The Agilent X-series signal analyzers do not have an auxiliary interface. |
| CNTLC | | CNTLC ^a | | Sets the interface control line C of the auxiliary interface high or low. The Agilent X-series signal analyzers do not have an auxiliary interface. |
| CNTLD | | CNTLD ^a | | Sets the interface control line D of the auxiliary interface high or low. The Agilent X-series signal analyzers do not have an auxiliary interface. |
| CNTLI | | CNTLI ^a | | Returns a "1" when the interface control line I of the auxiliary interface is high, and "0" if the line is low. The Agilent X-series signal analyzers do not have an auxiliary interface. |
| | CNVLOSS ^b | CNVLOSS | | Specifies the conversion loss of an external mixer used to extend the analyzer frequency range. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| | | | | The amplitude correction functions can be used to correct for system gains/losses that are external to the analyzer. |
| COMB | | | | Turns the comb generator on or off. The comb generator is used for performing a CAL YTF. This hardware is not present in Agilent X-series analyzers. Instead, the X-series analyzers have an internally-switched noise source that is used to align the YTF. |
| COMPRESS | COMPRESS | | | Reduces the number of trace elements while retaining the relative frequency and amplitude characteristics of the trace data. |
| CONCAT | CONCAT | | | Combines two traces. |
| CONTS | CONTS | CONTS | :INITiate:CONTinuous ON 1 | Sets the spectrum analyzer to the continuous sweep mode. |
| CORREK | | | :CALibration:AUTO? | Query the instrument for the state of corrections. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| COUPLE | | COUPLE | | Selects direct-current (dc) coupling or alternating-current (ac) coupling. |
| COUPLE AC DC | | COUPLE AC DC | :INPut:COUPling AC DC | Selects direct-current (dc) coupling or alternating-current (ac) coupling for the front panel RF INPUT port. A blocking capacitor is switched in for the ac mode. |
| COUPLE? | | COUPLE? | :INPut:COUPling? | The output is AC or DC. |
| | CR | CR | | Same as RB AUTO (see Page 102) |
| CRTHPOS | | | | Specifies the horizontal position of the text and graticule on the spectrum analyzer display. |
| CRTVPOS | | | | Specifies the vertical position of the text and graticule on the spectrum analyzer display. |
| | CS | CS | | Same as SS AUTO (see Page 113) |
| | CT | CT | | Same as ST AUTO (see Page 114) |
| CTA | CTA | | | Converts the source values from measurement units to the current absolute amplitude units and stores the result in the destination. |
| CTM | CTM | | | Converts the source values to measurement units and places the result in the destination. |
| | | CTRLHPIB ^a | | Takes control of the GPIB. |
| | CV | CV | | Same as VB AUTO (see Page 126) |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

D - E

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| | D1 | | | Sets the display for user-generated text and graphics to normal size. |
| | D2 | | | Sets the display for user-generated text and graphics to full CRT size. |
| | D3 | | | Sets the display for user-generated text and graphics to expanded size. |
| DA | DA | | | Accesses the current address of the display list. |
| DATEMODE | | DATEMODE ^a | | Allows you to set the format for displaying the real-time clock. Allows you to set the format for displaying the real-time clock. To set the date and time use the command :SYSTem:DATE <year>,<month>,<day>. The response output is in the form: MDY or DMY. |
| DATEMODE? | | | | |
| | | DELMKBW <percent> | | Returns the bandwidth of the selected percent of the power between the delta markers. |

- a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

- c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|------------------------------------|--|--|---|
| DEMOD DEMOD AM FM DEMOD ON OFF DEMOD? | | DEMOD DEMOD AM FM DEMOD ON OFF DEMOD? | [:SENSe]:DEMod AM FM PM OFF [:SENSe]:DEMod? | Turns the demodulator on or off, and selects between AM, FM, or quasi-peak demodulation. These commands require the N9063A Analog Demodulation Measurement Application Sets the type of demodulation. Turns demodulation on or off. The HP/Agilent 8560 and 8590-Series analyzer returns AM, FM or OFF. |
| | | DEMODAGC | | Turns the demodulation automatic gain control (AGC) on or off. IP turns AGC off. |
| | | DEMOT | [:SENSe]:DEMod:TIME <time> [:SENSe]:DEMod:TIME? | Selects the time the sweep pauses at the marker for demodulation of the signal. These commands require the N9063A Analog Demodulation Measurement Application |

- a. Added with 85620A mass memory module attached.
 b. No equivalent command for 8568B analyzer.

- c. No equivalent command for 8566B analyzer.
 d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| DET | DET | DET | [:SENSe]:DETEctor[:FUNction] NORMal NEGative POSitive AVERage SAMPLE | Specifies the spectrum analyzer peak detection mode. |
| DET NEG | DET NEG | DET NEG | | Specifies the detection mode. |
| DET POS | DET POS | DET POS | | Negative peak detection displays the lowest sample taken during the interval being displayed. |
| DET SMP | DET SMP | DET SMP | | Positive peak detection displays the highest sample taken during the interval being displayed. |
| | DET NRM | DET NRM | | Sample detection displays the first sample taken during the interval being displayed. |
| | DET NRM | DET NRM | | Normal detection alternates between displaying the positive/negative samples. |
| DET? | DET? | DET? | [:SENSe]:DETEctor[:FUNction]? | The Agilent X-series analyzer returns NEG, POS, NORM, AVER, SAMP, QPE, EAV, EPOS, MPOS or RMS. |
| DISPOSE | DISPOSE | DISPOSE ^a | | Deletes user-defined functions and frees spectrum analyzer memory that was previously allocated for user-defined operands. |
| DIV | DIV | DIV ^a | | Divides source 1 by source 2 and places the result in the destination. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|--|--|---|---|
| DL DL <value> DL ON OFF DL UP DN DL? | DL DL <value> DLE DL UP DN DL? | DL DL <value> DL ON OFF DL UP DN DL? | :DISPlay:WINDow:TRACe:Y:DLINe <ampl> :DISPlay:WINDow:TRACe:Y:DLINe: STATe OFF ON 0 1 :DISPlay:WINDow:TRACe:Y:DLINe? | Defines the level of the display line in the active amplitude units and displays the display line on the spectrum analyzer screen. Defines the level of the display line in the active amplitude units, if no units are specified. Turns the display line on or off. The HP/Agilent 8590-Series analyzer outputs data in the format: -25.00. The Agilent X-series analyzer outputs data in the format: -2.500E+01. |
| | | DLYSWP | :TRIGger:DElay <time> :TRIGger:DElay:STATe ON OFF 0 1 | Delays the start of the sweep until the specified time elapses after the trigger event. The functionality of the DLYSWP command is divided between the TRIG:DEL and TRIG:DEL:STAT SCPI commands. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| DN | | | DOWN | Reduces the active function by the applicable step size. There is no equivalent command in SCPI but you can implement the command by using UP or DOWN as a SCPI parameter in the equivalent SCPI command. For example, in the 8590-Series analyzers, if CF is the active function, you can send DN;DN;DN to decrease the center frequency by three times the step size. To do the same in SCPI you send :SENS:FREQ:CENT DOWN three times. |
| DONE DONE? | DONE DONE? | DONE DONE? | *OPC? | Allows you to determine when the spectrum analyzer has started to execute all commands prior to and including DONE. The HP/Agilent 8590, 8566B/8568B, and 8560 E/EC Series analyzers output data in the format: 1. The *OPC? command is only used after a sweep has been triggered or a self-alignment has been executed. The DONE? could be used after any analyzer setup command. |
| DOTDENS | | | | Sets the dot density value in the Analog+ display mode. |
| | DR | | | Sends the contents of the current display address. |
| DRAWBOX | | | | Draws a rectangular box on the spectrum analyzer display. |
| DSPLY | DSPLY | DSPLY ^a | | Displays the value of a variable on the spectrum analyzer screen. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| DT | DT | | | Defines any character as a label terminator. |
| | DW | | | Writes the value in the entry to the specified display memory address and increments the address by 1. |
| | E1 | E1 | | Same as MKPK HI (see Page 86) |
| | E2 | E2 | | Same as MKCF (see Page 81) |
| | E3 | E3 | | Same as MKSS (see Page 89) |
| | E4 | E4 | | Same as MKRL (see Page 88) |
| | | EDITDONE ^a | | Is used at the completion of limit-line editing with the EDITLIML command. |
| | | EDITLIML ^a | | Turns off any currently active limit lines and puts you in the edit mode. |
| EE | EE | | | Enables front-panel number entry. Sends the controller the values entered on the spectrum analyzer numeric keypad by the operator. |
| EK | EK | | | Allows data entry with the front-panel knob when the spectrum analyzer is under remote control. |
| | EM | EM ^a | | Clears the display of user-generated graphics. |
| ENTER | ENTER | ENTER ^a | | Allows the spectrum analyzer to receive data from other devices on the GPIB. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| EP | | | | Enter parameter from front panel. Sends values entered on the spectrum analyzer number keyboard to the present active function value. |
| ERASE | ERASE | | | Clears trace A and trace B, disposes of the contents of the user memory, and resets the state registers and the spectrum analyzer to the instrument preset state. |
| | ERR? | ERR? | :SYSTem:ERRor[:NEXT]? | Returns a list of error numbers (8560 E/EC Series) or the results of the power-on processor test (8566B/8568B) to the controller. Returns the next error number and description in the queue. |
| | | ET? | :SYSTem:PON:ETIme? | ET? returns the elapsed time of analyzer operation in hours. :SYSTem:PON:ETIme? returns the same measurement but it is returned in units of minutes. |
| | EX | EX | | Same as AXB (see Page 40) |
| EXP | EXP | EXP ^a | | Places the exponential of the source in the destination. |
| | EXTMXR ^b | | | Performs an external mixer preset. |
| | | EXTMXR PRE UNPR | | Specifies the type of external mixing as preselected or unpreselected. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

F

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------------|-------------------------------------|-------------------------------------|--|--|
| FA FA <value> FA UP DN FA? | FA FA <value> FA UP DN FA? | FA FA <value> FA UP DN FA? | [[:SENSe]:FREQuency:START <freq> [[:SENSe]:FREQuency:START? | Specifies the start frequency. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent X-series analyzer outputs data in the format: 7.50000000E+08. |
| FB FB <value> FB UP DN FB? | FB FB <value> FB UP DN FB? | FB FB <value> FB UP DN FB? | [[:SENSe]:FREQuency:STOP <freq> [[:SENSe]:FREQuency:STOP? | Specifies the stop frequency. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent X-series analyzer outputs data in the format: 7.50000000E+08 |
| | | FDIAG | | Returns the specified frequency diagnostic information. |
| | | FDSP | | Turns all frequency related annotation off. |
| FFT | FFT | FFT | | Performs a discrete fast Fourier transform on the source trace array and stores the result in the destination array. |
| FFTAUTO | | | | Performs a fast Fourier transform (FFT) on the signal on which the marker is placed. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| FFTCLIP | | | | Indicates if the FFT results are valid. |
| FFTCONTS | | | | Performs a fast Fourier transform (FFT) continuously on the current signal. |
| | FFTKNL | | | Performs a Fourier transform on two traces that represent the real and imaginary parts. |
| FTMKR | | | | Activates the FFT markers and displays the FFT annotation on the spectrum analyzer display. |
| FTMM | | | | Changes the FFT mid-display frequency of the spectrum analyzer to the frequency of the FFT marker. |
| FTMS | | | | Changes the FFT stop frequency of the spectrum analyzer to the frequency of the FFT marker. |
| FTTOFF | | | | Exits the fast Fourier transform (FFT) measurement and FFT settings. |
| FTPCTAM | | | | Turns the percent AM function on or off. during an FFT measurement. |
| FTPCTAMR | | | | Returns the percent of amplitude modulation(AM). |
| FTSNGLS | | | | Changes the spectrum analyzer sweep mode to single sweep mode (if necessary), and then performs a fast Fourier transform (FFT) on trace A. |
| FFTSTAT | | | | Returns the status of the spectrum analyzer FFT measurement functions. |
| FFTSTOP | | | | Sets the FFT stop frequency of the FFT measurement. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|---|--|--|
| FMGAIN FMGAIN <value> FMGAIN UP DN FMGAIN? | | | :DISPlay:FM:WINDow[1] 2 3:TRACe:Y[:SCALe]:PDIVision <real> :DISPlay:FM:WINDow[1] 2 3:TRACe:Y[:SCALe]:PDIVision? | Sets the total FM deviation for full screen demodulation. In the 859x, FMGAIN sets the FM deviation from the center horizontal graticule line to the top and bottom graticule. The SCPI command requires the N9063A Analog Demodulation measurement application to be loaded. It sets the FM deviation per division. Therefore, to obtain the same full-scale display, divide the desired FMGAIN value by 5 to obtain the value to use for setting the per-division deviation with the SCPI command. |
| FOFFSET FOFFSET? | FOFFSET FOFFSET? | FOFFSET FOFFSET UP_DN FOFFSET <value> FOFFSET? | :DISPlay:WINDow:TRACe:X[:SCALe]: OFFSet <freq> :DISPlay:WINDow:TRACe:X[:SCALe]: OFFSet? | Specifies the frequency offset for all absolute frequency readouts such as center frequency. The HP/Agilent 8590-Series analyzer outputs data in the format: 10. The Agilent X-series analyzer outputs data in the format: 1.0E+01. |
| FORMAT | | FORMAT ^a | | Formats the memory card. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|---|--|
| | FPKA ^b | | [[:SENSe]:POWer[:RF]:PCENter :CALCulate:MARKer:MAX :CALCulate:MARKer:Y? | Performs a fast preselector peak and returns the measured value at the active marker. Centers the preselector, puts a marker on the peak, and returns the amplitude value. |
| | | FREF | [[:SENSe]:ROSCillator:SOURce INTernal EXTernal | Specifies the internal, or an external, frequency reference source. |
| FS | FS | FS | [[:SENSe]:FREQuency:SPAN:FULL | Sets the frequency span of the analyzer to full span. The 8566B full span sets the frequency span to 0 Hz to 2.5 GHz ("low band"). Sets the frequency span to the analyzer's full span. |
| | FULBAND <integer> ^b | FULBAND K A Q U V E W F D G Y J | | For external mixing, it sets the full frequency span for the desired band. |
| FUNCDEF | FUNCDEF | FUNCDEF ^a | | Defines a routine consisting of spectrum analyzer commands, assigns the routine a label, and stores the routine and its label in the user memory. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

G

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|---|---|---|
| GATE GATE ON OFF | | GATE GATE ON OFF | [[:SENSe]:SWEep:EGATe:METhod VIDEo [:SENSe]:SWEep:EGATe[:STATe] OFF ON 0 1 | Turns time gating on or off. If you do not specify VIDEo, the LO gating will be used by default and many other settings will not work properly. |
| GATECTL GATECTL EDGE LEVEL GATECTL? | | GATECTL GATECTL EDGE LEVEL GATECTL? | [[:SENSe]:SWEep:EGATe:CONTRol EDGE LEVEL [:SENSe]:SWEep:EGATe:CONTRol? | Selects between the edge and the level mode for the time-gated spectrum analysis capability (requires Opt 105 on 8590 Series; standard in 8560 E/EC Series). Selects between the edge and the level mode for the time-gated spectrum analysis capability. Level triggers the gate when the signal surpasses a specific level, set to either low or high. Edge triggers the gate when the edge of a signal is encountered, set to either a negative-going edge or a positive-going edge. The HP/Agilent 8590-Series and 8560 E/EC Series analyzers return EDGE or LEVEL. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|------------------------------------|---|---|
| GC | | | | Presets Option 105, the time-gated spectrum analysis capability. |
| GD GD <value> GD UP DN GD? | | GD GD <value> GD? | [[:SENSe]:SWEep:EGATe:DElay <time> | Sets the delay time before the gate opens. Sets the delay time from when the gate trigger occurs to when the gate opens. This is for EDGE triggering only. The HP/Agilent 8590-Series analyzer outputs data in the format: 1E-6. The Agilent X-series analyzer outputs data in the format: 1.00000E-06. |
| GDRVCLPAR | | | | Clears the pulse parameters (pulse width, pulse repetition interval, and reference edge) for a time-gate measurement by setting the pulse parameters to 0. |
| GDRVGDEL | | | | For the frequency window only, GDRVGDEL sets the time delay from when the gate trigger occurs to when the gate is opened. |
| GDRVGLEN | | | | Adjusts the gate length in both the time and frequency windows. |
| GDRVGT | | | | Turns the gate on or off in the frequency window. |
| GDRVGTIM | | | | Activates the gate trigger marker, and places it at the given value. |
| GDRVPRI | | | | Enters the specified value as the pulse repetition interval. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|---|--|
| GDRVPWID | | | | Enters the specified value as the pulse width. Specifies the gate time length in seconds. For EDGE triggering only. |
| GDRVRBW | | | | Couples or uncouples the resolution bandwidth to the specified pulse width. |
| GDRVREFE | | | | Allows you to enter the position (in time) for a reference edge. |
| GDRVST | | | | Couples or uncouples the sweep time to the pulse repetition interval. |
| GDRVSWAP | | | | Makes the window (either the time or frequency window) that is currently not the active window, the active window. |
| GDRVSWDE | | | | Allows you to specify the delay from the edge of the gate trigger until the sweep is started in the time window. |
| GDRVSWP | | | [[:SENSe]:SWEep:EGATe:TIME <time> [:SENSe]:SWEep:EGATe:TIME ? | Specifies the sweep time for the time domain window of the gate utility. |
| GDRVUTIL | | | [[:SENSe]:SWEep:EGATe:VIEW ON OFF 0 1 [:SENSe]:SWEep:EGATe:VIEW? | Turns the gate utility on or off. In the 8590 Series analyzers, the Gate Utility appeared as a second window on the display. In the X-Series analyzers, the Gate View is displayed instead of the normal frequency-domain view. |
| GDRVVBW | | | | Couples or uncouples the video bandwidth to the gate length. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------------|------------------------------------|------------------------------------|--|---|
| GETPLOT | | | | Initiates output of the spectrum analyzer display to a plotter. |
| GETPRNT | | | :HCOPY[:IMMediate] | Initiates output of the spectrum analyzer display to a printer. |
| GL GL <value> GL UP DN GL? | | GL GL <value> GL? | [[:SENSe]:SWEep:EGATe:LENGth <time> [:SENSe]:SWEep:EGATe:LENGth? | Sets the length of time the gate is open. Output formats are different. |
| GP GP POS NEG GP? | | GP GP POS NEG GP? | [[:SENSe]:SWEep:EGATe:POLarity NEGative POSitive [:SENSe]:SWEep:EGATe: POLarity? | Sets the polarity (positive or negative) for the gate trigger. Returns POS or NEG. |
| GR | GR | | | Graphs the given y coordinate while incrementing the x coordinate by 1. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzers Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|------------------------------------|---|--|
| GRAT | GRAT | GRAT | | Turns the graticule on or off. The HP/Agilent 8590-Series and 8566B/8568B analyzers output ON or OFF. The Agilent X-series analyzer and 8560 E/EC Series analyzers output 1 or 0. |
| GRAT ON OFF | GRAT ON OFF | GRAT ON OFF | :DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe] OFF ON 0 1 | |
| GRAT? | GRAT? | GRAT? | :DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe]? | |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

H - K

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| HAVE | | | | Used by menus for testing for hardware configuration. |
| HD | HD | HD | | Disables data entry via the spectrum analyzer numeric keypad, knob, or step keys. The active function readout is blanked, and any active function is deactivated. |
| HN | | | | Returns the harmonic number of the current harmonic band in which the spectrum analyzer is tuning. |
| HNLOCK | HNLOCK ^b | HNLOCK | | Forces the spectrum analyzer to use only the selected harmonic band. |
| HNUNLK | HNUNLK ^b | HNUNLK | | Unlocks the harmonic band. |
| | I1 ^c | | :INPut:COUPling DC | Enables the left RF input (DC coupled). Selects DC input coupling |
| | I2 ^c | | :INPut:COUPling AC | Enables the right RF input (AC coupled). Selects AC input coupling |
| IB | IB | | :TRACe[:DATA] TRACE2, <data> | Provides a method for putting values into trace B. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| ID ID? | ID | ID? | *IDN? | Returns the spectrum analyzer model number. The HP/Agilent 8590-Series analyzer returns the model number in the format: HP 8592L. The HP/Agilent 8560 E/EC Series analyzers returns the model number followed by a comma-delimited string of the installed options. For example, "HP8563E,007,008" The Agilent X-series analyzer returns the format: Agilent Technologies, N9020A. It also returns the serial number and firmware revision. |
| | | IDCF | | Sets the center frequency to the frequency of the signal identified by the SIGID (signal identification) function. |
| | | IDCFREQ? | | Returns to the controller the frequency of the signal identified by the SIGID (signal identification) function. |
| | IDSTAT? ^b | | | Specifies the completion status of the signal identifier (SIGID). |
| IF | IF | IF ^a | | IF/THEN/ELSE/ENDIF forms a decision and branching construct. |
| | IFTKNL | | | Performs an inverse Fourier transform on two traces that represent the real and imaginary parts. |
| INT | INT | INT ^a | | Places the greatest integer that is less than or equal to the source value into the destination. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|----------------------------------|------------------------------------|-----------------------------------|---|--|
| INZ INZ 75 50 INZ? | | | [[:SENSe]:CORRections:IMPedance[:INPut][:MAGNitude] 50 75 | Specifies the value of input impedance expected at the active input port. Amplitude correction is applied to the display data to adjust for the measurement situations where the Unit Under Test has a different impedance than the instrument 50 Ohm input impedance. The HP/Agilent 8590-Series analyzer outputs data in the format: 50. |
| IP | IP | IP | :SYSTem:PRESet | Performs an instrument preset. |
| KEYCLR | | KEYCLR ^a | | Clears softkeys 1 through 6. |
| KEYCMD | | | | Allows you to define the function and label of a softkey. The softkey label is updated whenever a softkey is pressed. |
| KEYDEF | KEYDEF | KEYDEF ^a | | Assigns a label and user-defined function to a softkey. |
| KEYENH | | | | Allows you to activate inverse video mode or underline part or all of the softkey label. |
| KEYEXC | KEYEXC | | | Executes the specified, previously defined softkey. |
| KEYLBL | | | | Relabels a softkey without changing its function. |
| | KSA | | | Same as AUNITS DBM (see Page 39) |
| | KSB | | | Same as AUNITS DBMV (see Page 39) |
| | KSC | | | Same as AUNITS DBUV (see Page 39) |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| | KSD | | | Same as AUNITS V (see Page 39) |
| | KSE | | | Same as TITLE (see Page 119) |
| | KSF | | | Service diagnostic |
| | KSG/H | | | Same as VAVG ON/OFF (see Page 125) |
| | KSI | | | Extends reference level of analyzer. |
| | KSJ | | | Manual DAC control which is used as a diagnostic aid when servicing the spectrum analyzer. This functionality is not available on the X-series. |
| | KSK | | :CALCulate:MARKer:PEAK:EXCursion:STATe OFF; :CALCulate:MARKer:PEAK:THReshold:STATe OFF; :CALCulate:MARKer[1] 2 3 4:MAXimum:NEXT | A key difference between KSK and MKPK NH is that MKPK NH takes into account the peak excursion, whereas KSK does not. |
| | KSL/M | | | Same as MKNOISE OFF/ON (see Page 84) |
| | KSN | | | Same as MKMIN (see Page 83) |
| | KSO | | | Same as MKSP (see Page 88) |
| | KSP | | :SYSTem:COMMunicate:GPIB[:SELF]: ADDRESS <integer> | Changes the GPIB address. |
| | KSQ | | | Same as HNUNLK (see Page 65) |
| | KSR/KSS/KSU | | | Service command/Fast GPIB operation(/Fast high-band preset/External mixing preset) |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| | KST | | | Enables a fast preset, similar to an instrument preset (IP) except that the internal bus check is not performed. |
| | KSV | | | Same as FOFFSET (see Page 58) |
| | KSW | | :CALibration[:ALL] | Runs an internal self-alignment routine. Runs an internal self-alignment routine and applies the corrections. |
| | KSX, KSY | | :CALibration:AUTO OFF ON ALERT | Applies/removes the corrections from KSW. Turns on/off the alignment routine that runs continuously in the background. |
| | KSZ | | | Same as ROFFSET (see Page 105) |
| | KSa/KSb KSd/KSe | | | Same as DET NRM POS NEG SMP (see Page 51) |
| | KSc | | | Same as APB (see Page 39) |
| | KSf | | | Recalls last instrument state if there has been a power loss. |
| | KSg/KSh | | :DISPlay:ENABLE OFF ON 0 1 | Turns display off/on to conserve useful life. |
| | KSi | | | Same as BXC (see Page 42) |
| | KSj | | | Similar to VIEW TRC (see Page 127) |
| | KSk | | | Similar to BLANK TRC (see Page 41) |
| | KSl | | | Same as BTC (see Page 42) |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| | KSm/n | | | Same as GRAT OFF/ON (see Page 64) |
| | KSo | | | Same as ANNOT OFF (see Page 39) |
| | KSp | | | Same as ANNOT ON (see Page 39) |
| | KSq/KSr | | | Service diagnostic/Service diagnostic |
| | KSt | | | KSt in the 8566B is the same as HNLOCK (Page 65); KSt in the 8568B continues sweeping from the marker. |
| | KSu | | | Stops the sweep at the active marker. |
| | KSv | | | KSv in the 8566B is the same as SIGID (Page 109); KSv in the 8568B inhibits the phase lock and is used as a diagnostic aid for servicing the spectrum analyzer. |
| | KSw | | | Displays the correction data from KSW. |
| | KSx/KSy | | :TRIGger[:SEQuence]:RF:SOURce EXternal1 EXternal2 VIDeo | Selects external/video trigger, but eliminates refresh for sweeps < 20 ms. The X-series SCPI command for external or video trigger does not refresh the display for any sweep time if the trigger conditions have not been met. To allow refreshes of the display when the trigger conditions have not been met, activate the Auto Trigger feature (:TRIGger[:SEQuence]:ATRigger<time> and :TRIGger[:SEQuence]:ATRigger:STATe OFF ON 0 1) |
| | KSz | | | Displays specified memory address. |
| | KS, | | | Same as ML (see Page 91) |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| | KS= | | | KS= Selects factory defaults for preselector settings. |
| | KS/ | | | KS/ Allows preselector to be peaked manually. |
| | KS(and KS) | | | Locks/unlocks the contents of the internal instrument registers so they cannot be overwritten. |
| | KS | | | Same as DW (see Page 54) |
| | KS# | | | Service diagnostic |
| | KS> | | [:SENSe]:CORRection:SA:GAIN <rel_ampl> | Specifies preamp gain for signal input 2 (8568B) |
| | KS< | | [:SENSe]:CORRection:SA:GAIN <rel_ampl> | Specifies preamp gain for signal input 1 (8568B) |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|---|---|--|--|
| LB | LB | LB | | Writes text at the current pen position. |
| | | LCLVAR ^a | | Defines a local variable that can only be used within a FUNCDEF. |
| LF | LF ^b | | | Performs an instrument preset to the RF band (band 0). |
| LG LG <value> LG UP DN LG? | LG LG <value> LG UP DN LG? | LG LG <value> LG UP DN LG? | :DISPlay:WINDow:TRACe:Y[:SCALe]: SPACing LOGarithmic :DISPlay:WINDow:TRACe:Y[:SCALe]: PDIVision <rel_amp> :DISPlay:WINDow:TRACe:Y[:SCALe]: SPACing? :DISPlay:WINDow:TRACe:Y[:SCALe]: PDIVision? | Specifies the vertical graticule divisions as logarithmic units, without changing the reference level. The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent X-series analyzer outputs data in the format: 1.00E+01. |
| | | LIMD ^a | | Enters the delta value for the amplitude of a limit-line segment. |
| | | LIMF ^a | | Enters the frequency value for a limit-line segment. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| LIMIDEL | | LIMIPURGE ^a | | Deletes all segments in the current limit-line table. |
| LIMIDISP | | | | Controls when the limit line (or limit lines) are displayed. |
| LIMIFAIL | | LIMIFAIL ^a | | Returns a "0" if the last measurement sweep of the trace A (856x/859x) or trace 1 (for X-series) is equal to or within the limit-line bounds. |
| LIMIFT | | | | Selects how the limit-line segments are placed on the spectrum analyzer display, according to frequency, or according to the sweep time setting of the spectrum analyzer. |
| LIMIHAF LIMIHI | | | | Edit/specify upper or lower limit line only. Allows you to specify a fixed trace as the upper limit line. |
| LIMILINE | | | | Outputs the current limit-line table definitions. |
| LIMILO | | | | Allows you to specify a fixed trace as the lower limit line. |
| LIMIMIRROR | | | | Reflects the current definition about the amplitude axis at the largest frequency or the largest sweep time in the definition. There is no similar function in the Agilent X-series analyzers. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| LIMIMODE | | | | Determines whether the limit-line entries are treated as upper amplitude values, lower amplitude values, upper and lower amplitude values, or mid-amplitude and delta values. |
| LIMIREL | | LIMIREL ^a | | Specifies the current limit lines as fixed or relative. |
| | | LIMIRCL ^a | | Recalls a limit-line set from the limit-line table in the module user memory. Recalls a specified limit-line from a file in instrument memory. |
| | | LIMISAV ^a | | Saves the active limit-line to the module memory under the name assigned to it. Saves the specified limit-line to the instrument memory under the filename assigned. |
| LIMISEG | | | | Adds new segments to the current frequency limit line in either the upper limit line or the lower limit line. <x> is frequency in Hz or time in seconds. <ampl> is amplitude in dB. <connected>: 1 = connected, and 2 = not connected. |
| LIMISEGT | | | | Adds new segments to the current sweep time limit line in either the upper limit line or the lower limit line. <x> is frequency in Hz or time in seconds. <ampl> is amplitude in dB. <connected>: 1 = connected, and 2 = not connected. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| LIMITEST | | LIMITEST ^a | | Compares trace A (856x/859x) or trace 1 (for X-series) with the current limit-line data. |
| | | LIML ^a | | Is used within the SEDI command to assign the lower-limit amplitude value to a limit-line segment. |
| | | LIMM ^a | | Is used within the SEDI command to assign the middle amplitude value to a limit-line segment. |
| | | LIMTFL ^a | | Is used within the SEDI command to make the selected limit-line segment flat. |
| | | LIMTSL ^a | | Is used within the SEDI command to make the selected limit-line segment have a slope. |
| | | LIMU ^a | | Is used within the SEDI command to assign the upper-amplitude value to a limit-line segment. |
| LINFILL | | | | Fills linear interpolated data into the specified trace data points of a destination trace. |
| | LL | | | Provides the lower left recorder output voltage at the rear panel. |
| LN | LN | LN | :DISPlay:WINDow:TRACe:Y[:SCALE]:SPACing LINear | Specifies the vertical graticule divisions as linear units, without changing the reference level. Specifies the vertical graticule divisions as log or linear units. |
| | LO | | | Same as DL OFF (see Page 52) |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| LOAD | | | :MMEMory:LOAD:STaTe <file_name> :MMEMory:LOAD:TRACe TRACE1 TRACE2 TRACE3, <file_name> | For loading a trace, amplitude correction, limit, or state. For loading the analyzer state from a file. For loading a trace. |
| LOG | LOG | LOG ^a | | Takes the logarithm (base 10) of the source, multiplies the result by the scaling factor, then stores it in the destination. |
| LSPAN | | | [[:SENSe]:FREQuency:SPAN:PREVious | Changes the spectrum analyzer span to the previous span setting. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

M

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| | M1 | M1 | | Same as MKOFF (see Page 85) |
| | M2 | M2 | | Same as MKN (see Page 84) |
| | M3 | M3 | | Same as MKD (see Page 81) |
| M4 | M4 | | :CALCulate:MARKer[1] 2 3 4:MODE POSition | <p>Activates a single marker on the trace and enables the knob to change the position of the marker. The active function is then set to span.</p> <p>Activates a single marker on the trace and enables the knob to change the position of the marker.</p> <p>The SCPI command only makes marker the active function if marker was already the active function before. Otherwise, whatever the previous active function was will be the active function after this command is sent.</p> |
| | MA | | | Same as MKA? (see Page 80) |
| | | MBIAS | | <p>Sets the bias level for external mixers that require diode bias for efficient mixer operation.</p> <p>Turns the bias level on/off for external mixers.</p> |
| | MBRD/MBWR | | | Reads/writes the specified memory block. |
| | MC | | | Same as MKFC (see Page 82) |

- a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

- c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|--------------------------------------|---|---|---|
| | MC0 ^c MC1 ^c | | :CALCulate:MARKer[1] 2 3 4:FCOunt [:STATe] OFF ON 0 1 | Turns off the marker frequency counter. Turns on the marker frequency counter. Turns on/off the marker frequency counter for the specified marker. |
| MDS | MDS | | :FORMat [:TRACe][:DATA] ASCII INTEger,32 REAL,32 REAL,64 | Specifies measurement data size as byte or word. Specifies the measurement data size in SCPI. (It is not possible to get data in byte or word sizes in the X-Series analyzers. 32-bit integer is the smallest data size available.) |
| MDU | MDU | | | Returns values for the spectrum analyzer baseline and reference level. |
| MEAN MEAN TRA? MEAN TRB? MEAN TRC? | MEAN MEAN TRA MEAN TRB | MEAN ^a MEAN TRA? ^a MEAN TRB? ^a | :CALCulate:DATA<n>:COMPRESS? MEAN | Returns the mean value of the given trace in measurement units. Returns the mean of the amplitudes of the trace amplitude elements in measurement units. The format of the response data will be different. In the SCPI command, the value of n denotes the trace number. For example, a value of 1 indicates Trace 1 (equivalent of Trace A in the legacy analyzers). Trace 2 is equivalent to Trace B and Trace 3 is equivalent to Trace C. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| | | MEANPWR | | Measures the average power of the carrier while the burst is turned on and allows you to define the carrier-on amplitude range, in decibels below the peak value of the specified trace. |
| | | MEAS? | :INITialize:CONTinuous? | Returns the current sweep status. (SNGLS CONTS) Returns 1 if in continuous or 0 if in single sweep. |
| MEANTH | | | | Returns the mean value of the given trace above the threshold, in measurement units. |
| MEASOFF | | | | Turns off the current measurement, erases the display, and then displays the menu accessed by MEAS/USER. |
| MEASURE | | | | Determines the type of measurement: signal analysis, stimulus response, or signal normalization. |
| MEM | MEM | MEM ^a | | Returns the amount of spectrum analyzer memory available. |
| MENU | | MENU ^a | | Selects and displays the softkey menus on the spectrum analyzer screen. |
| MERGE | MERGE | | | Merges the source trace into the specified area of the destination trace. |
| MF | MF | MF | :CALCulate:MARKer[1] 2 3 4:X? | Returns the frequency (or time) of the on-screen active marker. Returns the value in x-axis units, of the specified marker. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| MIN | MIN | MIN ^a | | Compares source 1 and 2, point by point, and stores the lesser of the two in the destination. |
| MINH | | MINH | :TRACe[1] 2 3:MODE MINHold | Updates trace C elements with minimum level detected. Selects the display mode for the selected trace. Minimum hold displays the lowest measured trace value for all the data that has been measured since the function was turned on. |
| MINPOS | MINPOS | | :CALCulate:MARKer[1] 2 3 4 5 6 7 8 9 10 11 12:MINimum :CALCulate:MARKer[1] 2 3 4 5 6 7 8 9 10 11 12:X:POSition? | Returns a value, which is the x-axis position (in display units) of the minimum amplitude value in trace A, trace B, trace C, or user-defined trace. |
| MIRROR | MIRROR | | | Displays the mirror image of a trace. |
| MKA MKA? | MKA MKA? | MKA MKA? | :CALCulate:MARKer[1] 2 3 4:Y? | Specifies amplitude of the active marker. Read the current y-axis value for the designated marker on the assigned trace. The value is in the y-axis units for the trace (dBm, volts, and so forth). The HP/Agilent 8590-Series analyzer outputs data in the format: -66.9. The Agilent X-series analyzer outputs data in the format: -6.69E+01. The FORMat:DATA command changes the data output format. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|----------------------------------|------------------------------------|-----------------------------------|---|---|
| MKACT MKACT 1 2 3 4 MKACT? | MKACT MKACT 1 2 3 4 MKACT? | | :CALCulate:MARKer[1] 2 3 4:STATe ON 1 :CALCulate:MARKer[1] 2 3 4:STATe? | Specifies the active marker. |
| MKACTV | | | | Makes the current active marker the active function. |
| MKBW | | MKBW | | 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 | MKCF | MKCF | :CALCulate:MARKer[1] 2 3 4[:SET]: CENTER | Sets the center frequency equal to the marker frequency and moves the marker to the center of the screen. Sets the center frequency equal to the specified marker frequency, which moves the marker to the center of the screen. |
| | | MKCHEDGE | | Moves the delta markers to ± 0.5 channel widths from the center frequency. |
| MKCONT | MKCONT | | | Resumes the sweep after execution of a MKSTOP command. |
| MKD | MKD | MKD | :CALCulate:MARKer[1] 2 3 4:MODE DELTa :CALCulate:MARKer[1] 2 3 4:X <param> | Activates the delta marker. Positions and activates the designated marker on the assigned trace at the specified X value. The value is in the x axis units (which is often frequency or time). |
| | | MKDELCHBW | | Sets the channel power bandwidth to the difference between the delta markers. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| MKDLMODE | | | | Selects whether the marker amplitude values are shown as relative to the reference level (normal mode), or relative to the display line (delta mode) when the marker table is turned on. |
| | | MKDR | | Displays the reciprocal of the frequency (or time, when in zero span) difference between two markers. |
| MKF | MKF | MKF | :CALCulate:MARKer[1] 2 3 4:X <param> | Specifies the frequency value of the active marker. |
| MKF? | MKF? | MKF? | :CALCulate:MARKer[1] 2 3 4:X? | Positions the designated marker on the assigned trace at the specified x-axis value. The value is in the x-axis units (which is often frequency or time). The HP/Agilent 8590-Series analyzer outputs data in the format: 750E6. The Agilent X-series analyzer outputs data in the format: +7.50000000E+008. The FORMat:DATA command changes the data output format. |
| MKFC | MKFC ^c | MKFC | :CALCulate:MARKer[1] 2 3 4:FCOunt [:STATe] OFF ON 0 1 | Turns the marker frequency counter on or off. Turns the marker frequency counter on or off for the specified marker. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| MKFCR | MKFCR ^c | MKFCR | | Sets the resolution of the marker frequency counter. |
| MKFCR <freq> | MKFCR <freq> | MKFCR <freq> | :CALCulate:MARKer:FCOunt: RESolution <real> | Sets the resolution of the marker frequency counter. AUTO ON couples the marker counter resolution to the frequency span. |
| MKFCR AUTO | | | :CALCulate:MARKer:FCOunt: RESolution:AUTO ON 1 | Sets the resolution of the marker frequency counter so it is automatically coupled to the frequency span, generating the fastest accurate count. |
| MKFCR UP DN | | | | |
| MKFCR? | MKFCR? | MKFCR? | :CALCulate:MARKer:FCOunt: RESolution? | The HP/Agilent 8590-Series analyzer outputs data in the format: 1000. The Agilent X-series analyzers output data in the format: 1.0000000E+03. |
| | | MKMCF | | Moves the midpoint of the delta markers to the center frequency. |
| MKMIN | MKMIN | MKMIN | | Moves the active marker to the lowest point on the trace that is assigned to that particular marker number. |
| | | | :CALCulate:MARKer[1] 2 3 4: MINimum | Places the selected marker on the lowest point on the trace that is assigned to that particular marker number. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| MKN | MKN | MKN | :CALCulate:MARKer[1] 2 3 4:MODE POSition | Activates a normal marker and positions it at the center of the active trace. |
| | | | :CALCulate:MARKer[1] 2 3 4:X <param> | Activates the designated marker and positions it at the center of the active trace. |
| | MKN UP DN | MKN UP DN | | Positions the designated marker on the current trace at the specified x value. The value is in the x-axis units (which is often frequency or time). |
| MKN? | MKN? | MKN? | :CALCulate:MARKer[1] 2 3 4:X? | Moves the active marker to the right (UP) or left (DN) a distance that is 10% of the current frequency span. |
| | | | | The HP/Agilent 8590-Series analyzer outputs data in the format: 750E6. The Agilent X-series analyzers output data in the format: +7.50000000E+008. |
| | | | | The FORMat:DATA command changes the data output format. |
| MKNOISE | MKNOISE | MKNOISE | :CALCulate:MARKer[1] 2 3 4: FUNCTION NOISe OFF | Displays the average noise level at the marker. |
| MKNOISE? | MKNOISE? | MKNOISE? | :CALCulate:MARKer[1] 2 3 4: FUNCTION? | Selects the marker function for the specified marker. NOISe is a noise measurement. |
| | | | | The HP/Agilent 8590-Series analyzer returns ON or OFF. The Agilent X-series analyzer returns NOIS or OFF. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| MKOFF | MKOFF | MKOFF | :CALCulate:MARKer[1] 2 3 4:STATe OFF ON 0 1 | Turns off either the active marker or all the markers. Turns the selected marker on or off. |
| MKOFF ALL | MKOFF ALL | MKOFF ALL | :CALCulate:MARKer:AOff | Turns off all the markers on all the traces. |
| MKP | MKP | | :CALCulate:MARKer[1] 3 3 4:X: POSition <integer> | Places the active marker at the given x-axis coordinate. (in display units, not x-axis units like frequency or time) |
| MKP? | MKP? | | :CALCulate:MARKer[1] 3 3 4:X: POSition? | The HP/Agilent 8590-series analyzer outputs data in the format: 200. The Agilent X-series analyzer outputs data in the format: +2.00000000E+002. Use CALC:MARK:PEAK:SEAR:MODE to specify how peaks are defined. The FORMat:DATA command changes the data output format. |
| MKPAUSE | MKPAUSE | | | Pauses the sweep at the active marker for the duration of the delay period. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| MKPK | MKPK | MKPK | | Positions the active marker on a signal peak. |
| MKPK HI | MKPK HI | MKPK HI | :CALCulate:MARKer[1] 2 3 4: MAXimum | Places the selected marker on the highest point on the trace that is assigned to that particular marker number. |
| MKPK NL | MKPK NL | MKPK NL | :CALCulate:MARKer[1] 2 3 4: MAXimum:LEFT | Places the selected marker on the next signal peak to the left of the current marked peak. |
| MKPK NH | MKPK NH | MKPK NH | :CALCulate:MARKer[1] 2 3 4: MAXimum:NEXT | Places the selected marker on the next highest signal peak from the current marked peak. |
| MKPK NR | MKPK NR | MKPK NR | :CALCulate:MARKer[1] 2 3 4: MAXimum:RIGHT | Places the selected marker on the next signal peak to the right of the current marked peak. |
| | | MKPT | CALCulate:MARKer[1] 2 3 4: PEAK:THReshold <ampl> | Specifies the marker peak threshold. Specifies the marker peak threshold for the specified marker. Select the parameter peak search mode to use threshold settings. See CALC:MARK:PEAK:SEAR:MODE PAR. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| MKPX | MKPX | MKPX | | Specifies the minimum signal excursion for the spectrum analyzer internal peak-identification routine. |
| MKPX <value> | MKPX <value> | MKPX <value> | :CALCulate:MARKer:PEAK:EXCursion <rel_ampl> | Specifies the minimum signal excursion for the analyzer internal peak identification routine to recognize a signal as a peak. This applies to all traces and all windows. The HP/Agilent 8560 E/EC Series analyzers consider trace data both above and below the peak threshold when applying the peak excursion criteria. As a result, if the peak excursion is 6 dB, for example, a valid peak could be only 1 dB above the peak threshold as long as it extended at least 5 dB below the peak threshold. The Agilent X-series analyzers, by comparison, require the entire peak excursion to occur above the peak threshold for the peak to be valid. |
| MKPX UP DN | | MKPX UP DN | | |
| MKPX? | MKPX? | MKPX? | :CALCulate:MARKer:PEAK: EXCursion? | The HP/Agilent 8590-Series and 8566B/8568B analyzers output data in the format: 6.00. The Agilent X-series analyzer outputs data in the format: +6.000000000E+00. Select the parameter peak search mode to use excursion settings. See CALC:MARK:PEAK:SEAR:MODE PAR. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| MKREAD | MKREAD | | | Selects the type of active trace information displayed by the spectrum analyzer marker readout. |
| MKREAD FRQ | MKREAD FRQ | | :CALCulate:MARKer[1] 2 3 4:X: READout FREQuency TIME ITIME PERiod | Selects the units for the x-axis readout of the marker. Available units are: frequency, time, inverse of time, period. |
| MKREAD SWT | MKREAD SWT | | | |
| MKREAD IST | MKREAD IST | | | |
| MKREAD PER | MKREAD PER | | | |
| MKREAD FFT | MKREAD FFT | | :CALCulate:MARKer[1] 2 3 4:X: READout? | FFT is an invalid parameter for the Agilent X-series signal analyzers. |
| MKREAD? | MKREAD? | | :CALCulate:MARKer[1] 2 3 4:X: READout? | The HP/Agilent 8590-Series analyzer returns marker readout in the format: FRQ SWT IST or PER. The Agilent X-series analyzers return FREQ, TIME, ITIM, or PER. |
| MKRL | MKRL | MKRL | :CALCulate:MARKer[1] 2 3 4[:SET]: RLEVel | Sets the reference level to the amplitude value of the active marker. |
| MKSP | MKSP | MKSP | :CALCulate:MARKer[1] 2 3 4[:SET]: SPAN | Sets the start and stop frequencies to the values of the delta markers. Sets the span to the value of the specified marker frequency. The specified marker must be in delta mode. Select the delta marker mode with :CALCulate:MARKer [1] 2 3 4:MODE:DELTA. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| MKSS | MKSS | MKSS | :CALCulate:MARKer[1] 2 3 4[:SET]: STEP | Sets the center frequency step size to the marker frequency. Sets the center frequency step size equal to the marker frequency. |
| MKSTOP | MKSTOP | | | Stops the sweep at the active marker. |
| | | MKT | :CALCulate:MARKer[1] 2 3 4:X <value> | Sets the marker to the position corresponding to the amount of time from the beginning of the sweep. In zero span, this command sets the marker's x-axis location in time units. In a non-zero frequency span, this command does not accept sweep time units. Convert the desired time to an equivalent frequency: $F_x = \left(\frac{T_x}{T_{sweep time}} \right) F_{span} + F_{start}$ |
| MKTBL | | | :CALCulate:MARKer:TABLE:STATe OFF ON 0 1 | Turns the marker table on or off. |
| MKTBL? | | | :CALCulate:MARKer:TABLE:STATe? | The HP/Agilent 8590-Series analyzer outputs ON or OFF. The Agilent X-series analyzer outputs +1 or 0. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| MKTRACE | MKTRACE | | | Moves the active marker to a corresponding position in trace A, trace B, or trace C. |
| MKTRACE TRA | MKTRACE TRA | | :CALCulate:MARKer[1] 2 3 4:TRACe: AUTO OFF ON 0 1 | Automatically puts markers at the same x position on all the traces. |
| MKTRACE TRB | MKTRACE TRB | | | |
| MKTRACE TRC | MKTRACE TRC | | :CALCulate:MARKer[1] 2 3 4:TRACe <integer> | Assigns the specified marker to the designated trace 1, 2, or 3. |
| MKTRACE? | MKTRACE? | | :CALCulate:MARKer[1] 2 3 4:TRACe? | The HP/Agilent 8590-Series and 8566B/8568B analyzers return TRA, TRB, or TRC. The Agilent X-series analyzer returns +1, +2, or +3. |
| MKTRACK | MKTRACK | MKTRACK | | Moves the signal with an active marker to the center of the spectrum analyzer display and keeps the signal peak at center screen. |
| | | | :CALCulate:MARKer[1] 2 3 4: TRCKing[:STATe] OFF ON 0 1 | Turns marker signal tracking on or off. It continuously puts the selected marker on the highest displayed signal peak and moves it to the center frequency. This allows you to keep a signal on the display that is drifting in frequency. |
| MKTRACK? | MKTRACK? | MKTRACK? | :CALCulate:MARKer[1] 2 3 4: TRCKing[:STATe]? | The HP/Agilent 8590-Series analyzer outputs ON or OFF. The 8560 E/EC Series analyzer outputs 1 or 0. The Agilent X-series analyzer outputs +1 or 0. |
| MKTYPE | MKTYPE | | | Changes the type of the current active marker. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| ML | ML | ML | | Specifies the maximum signal level that is applied to the input mixer for a signal that is equal to or below the reference level. |
| ML <value> | ML <value> | ML <value> | [[:SENSe]:POWer[:RF]:MIXer:RANGe [:UPPer] <ampl> | Specifies the maximum power at the input mixer for a signal this is equal to or below the reference level. |
| ML UP DN | | ML UP DN | | |
| ML? | ML? | ML? | [[:SENSe]:POWer[:RF]:MIXer:RANGe [:UPPer]?] | The HP/Agilent 8590-Series analyzer outputs data in the format: -10. The Agilent X-series analyzer outputs data in the format: -1.00000000E+001. |
| MOD | MOD | MOD ^a | | Stores the remainder from the division of source 1 by source 2 in the destination. |
| MODE | | | | Returns a "0" if the mode of operation is spectrum analysis. A number other than "0" is returned if the operating mode (also called "personality") is other than spectrum analysis. |
| | | MODRCLT ^a | :MMEMory:STORE:STATE TRACE1 TRACE2,<filename> | Recalls a trace from the source specified by MSDEV to the TRA/TRB in the instrument. |
| | | MODSAVT ^a | :MMEMory:LOAD:TRACE TRACE1 TRACE2, <filename> | Saves a trace in module memory. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| MOV | MOV | MOV ^a | :TRACE:COPY <source_trace>,<dest_trace> | Copies the source values into the destination. <dest_trace>, <num_value> Transfers the source trace to the destination trace. Source traces are: TRACE[1] 2 3 Destination traces are: TRACE[1] 2 3 |
| MPY | MPY | MPY ^a | | Multiplies the sources, point by point, and places the results in the destination. |
| | MRD | | | Reads the two-byte word at the specified memory address and returns it to the controller. |
| | MRDB | | | Reads the 8-byte word at the specified memory address and returns its ASCII equivalent to the controller. |
| | | MSDEV ^a | | Specifies the data storage and access device to be either the module memory or the memory card. |
| MSI | | | | Allows you to specify the current mass storage device as the spectrum analyzer memory or a memory card. |
| | MT0 | MT0 | | Same as MKTRACK OFF (see Page 90) |
| | MT1 | MT1 | | Same as MKTRACK ON (see Page 90) |
| | MWR | | | Writes a two-byte message, starting at the specified memory address. |
| | MWRB | | | Writes a one-byte message to the specified memory address. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| MXM | MXM ^b | MXM ^a | | Compares source 1 and source 2, point by point, sending the greater value of each comparison to the destination. |
| MXMH | MXMH ^b | MXMH | :TRACe[1] 2 3:MODE MAXHold | Updates trace elements with maximum level detected. |
| | | MXRMODE | | Specifies an internal or external mixer mode. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

N - O

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| NDB NDB? | | | | Specifies the distance (in dB) from the signal peak for the N dB points measurement (NDBPNT). The HP/Agilent 8590-Series analyzer outputs data in the format: -3. |
| NDBPNT NDBPNT? | | | | Turns the N dB points measurement on or off. The HP/Agilent 8590-Series analyzer outputs ON or OFF. |
| NDBPNTR? | | | | Returns the bandwidth measured by the N dB points measurement (NDBPT). |
| | | NORMALIZE | :CALCulate:NTData[:STATe] OFF ON 0 1 :CALCulate:NTData[:STATe]? | Activates the normalization routine for stimulus-response measurements. |
| NRL NRL? | | NRL NRL? | :DISPlay:WINDow:TRACe:Y[:SCALe]:NRLevel<rel_ampl> :DISPlay:WINDow:TRACe:Y[:SCALe]:NRLevel? | Sets the normalized reference level. The HP/Agilent 8590-series analyzer outputs data in the format: 10. The Agilent X-series analyzer outputs data in the format: +1.00E+01. |
| | | NRPOS | | Adjusts the normalized reference position. |
| | NSTART ^b | | | Specifies the start harmonic for signal identification (SIGID). |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| | NSTOP ^b | | | Specifies the stop harmonic for signal identification (SIGID). |
| | 01 | | | Same as TDF P (see Page 118) |
| | 02 | | | Same as TDF B:MDS W (see Page 118 , Page 78) |
| | 03 | | | Same as TDF M (see Page 118) |
| | 04 | | | Same as TDF B:MDS B (see Page 118 , Page 78) |
| OA | OA or ? | OA or ? | | Returns the value of the active function. |
| OBW | | | :MEASure:OBWidth? | Performs the occupied bandwidth measurement using the value for occupied bandwidth percent (OBWPCT). |
| OBWPCT | | OCCUP | [:SENSe]:OBWidth:PERCent <percent> | Specifies the percent of total power that is to be used in calculating the occupied bandwidth (OBW). |
| OL | OL | | | Output current state in learn string format. |
| ONCYCLE | | | | Executes the list of analyzer commands periodically. |
| ONDELAY | | | | Executes the list of analyzer commands after the time value has elapsed. |
| ONEOS | ONEOS | ONEOS ^a | | Executes the list of analyzer commands after the end of the sweep. |
| ONMKR | | | | Performs the list of analyzer commands when the sweep reaches the marker position. |
| ONMKRU | | | | Executes the list of analyzer commands whenever the value or the units of the active marker are changed. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| ONPWRUP | | | | Executes the list of spectrum analyzer commands once on power up. |
| ONSRO | | | | Executes the list of analyzer commands whenever a service request occurs. |
| ONSWP | ONSWP | | | Executes the list of analyzer commands at the beginning of the sweep. |
| ONTIME | | | | Executes the list of analyzer commands at the specified time. |
| OP | OP? | OP? | | Returns the coordinates of the lower-left and upper-right corners of the spectrum analyzer display (P1,P2). |
| | | OR ^a | | Sets the origin of the graphics pen as determined by the values of the x- and y-coordinate offsets. |
| | OT | | | Returns all CRT annotation as 32 strings. |
| OUTPUT | OUTPUT | OUTPUT ^a | | Allows the spectrum analyzer to send data to other devices on the GPIB. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

P - Q

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| PA | PA | PA ^a | | Moves the pen to a vector location on the spectrum analyzer screen relative to the reference coordinates (0,0). |
| PARSTAT | | | | Returns parallel port status. |
| PCTAM | | | | Turns the percent AM measurement on or off. |
| PCTAMR | | | | Returns the percent AM measured by the percent AM measurement (PCTAM). |
| PD | PD | PD ^a | | Instructs the spectrum analyzer to plot vectors on the spectrum analyzer screen until a PU command is received. |
| PDA | PDA | PDA ^a | | Sums the probability distribution of amplitude in the destination trace with the amplitude distribution function of the source trace. |
| PDF | PDF | PDF ^a | | Increments an element of the destination trace whenever the corresponding element of the source trace exceeds a threshold. |
| PEAKS | PEAKS | PEAKS ^a | :CALCulate:DATA[1] 2 3 4 5 6:PEAKs?<threshold>,<excursion>[.AMPLitude FREQuency]TIME[.ALL GTDLine LTDLine] | Sorts signal peaks by frequency or amplitude, stores the results in the destination trace, and returns the number of peaks found. |
| PKDLMODE | | | :CALCulate:MARKer:PEAK:TABLE:READout ALL GTDLine LTDLine :CALCulate:MARKer:PEAK:TABLE:READout? | Selects the signal peaks that are displayed in the peak table. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| PKPOS | PKPOS | | :CALCulate:MARKer[1] 2 3 4 5 6 7 8 9 10 11 12:MAXimum :CALCulate:MARKer[1] 2 3 4 5 6 7 8 9 10 11 12:X:POSition? | Returns a value, which is the index of the maximum value in trace A, trace B, trace C, or user-defined trace. |
| PKRES | | | | Returns the x-axis coordinates of the peaks in the peak table. |
| PKSORT | | | :CALCulate:MARKer:PEAK:SORT FREQuency AMPLitude | Selects how the signal peaks listed in the peak table are sorted: by decreasing amplitude or by ascending frequency. |
| PKTBL | | | :CALCulate:MARKer:PEAK:TABLE:STATe ON OFF 0 1 | Turns the peak table on or off. |
| PKZMOK | | | | Returns a "0" if the peak zoom routine (PKZOOM) found only the spectrum analyzer local oscillator feedthrough, otherwise a "1" is returned. |
| PKZOOM | | | | Automatically tunes the spectrum analyzer to the signal with the highest amplitude level while narrowing the frequency span to the specified frequency span. |
| PLOT | PLOT | PLOT | | Initiates a plotter output of the screen data to the remote interface. |
| | | PLOTORG | | Specifies whether the P1, P2 plotter settings are the origin for the graticule, or the entire spectrum analyzer display. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|--------------------------------------|---|---|
| PLTPRT | | | | Directs the plotter output to GPIB, serial or parallel ports. |
| | | PLOTSRC ALL TRA TRB GRT ANNT | | Specifies the source for the plot. |
| POWERON | | | :SYSTem:PON:TYPE PRESet LAST | Selects the state the spectrum analyzer will be in when it is turned on: IP (instrument preset) or LAST state. |
| POWERON? | | | :SYSTem:PON:TYPE? | The response is: PRESET or LAST. |
| PP | pp ^b | PP | [[:SENSe]:POWer[:RF]:PCENter | Performs a preselector peak. Centers the preselector tracking to maximize amplitude of the signal at the specified marker by minimizing the loss through the filter. |
| PR | PR | PR ^a | | Moves the pen to a new plot location on the spectrum analyzer screen relative to the current coordinates in display units. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| PREAMPG | | | | Subtracts a positive or negative preamplifier gain value from the displayed signal. |
| PREAMPG? | | | [[:SENSe]:CORRection:OFFSet [:MAGNitude] <rel_ampl> :SENSe]:CORRection:OFFSet [:MAGNitude]? | The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent X-series analyzer outputs data in the format: +1.00000000E+001. |
| PREFX | | | | Specifies or changes the prefix used in save and recall operations. |
| PRINT | | PRINT | HCOPY[:IMMEDIATE] | Initiates output of the spectrum analyzer display to a printer. |
| PRNPRT | | | | Directs the printer output to GPIB, serial or parallel ports. |
| PRNTADRS | | | | Allows you to set the GPIB address of the printer. |
| | PS | | | Skips remaining display data and goes to next page of display data. |
| | | PSDAC | [[:SENSe]:POWer[:RF]:PADJust <freq> | Specifies the preselector peak DAC setting. The X-series SCPI command accepts a frequency offset as the command parameter, whereas the 8560 E/EC Series command accepts a DAC count as its parameter. |
| PSTATE | | PSTATE | | Protects all of the spectrum analyzer user state and trace registers from being changed. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| PU | PU | PU ^a | | Instructs the spectrum analyzer not to plot vectors on the spectrum analyzer screen until a PD command is received. |
| PURGE | | | | Deletes the specified file from the current mass storage device. Replaced by DELETE. |
| PWRBW | PWRBW | PWRBW | CONFigure:OBW? [:SENSe]:OBWidth:PERCent <percent> READ:OBW: OBWidth? | Computes the bandwidth around the trace center, which includes signals whose total power is a specified percentage of the total trace signal power. Turn on OBW measurement. Set the desired percent of power. Return the bandwidth. |
| PWRUPTIME PWRUPTIME? | | | :SYSTem:PON:TIME? | Returns the number of milli-seconds that have elapsed since the spectrum analyzer was turned on. For the HP/Agilent 8590 series, returns the time in milliseconds since the last power on. The X-series SCPI command returns the elapsed time since the most recent power-up in seconds. The HP/Agilent 8590-Series analyzer outputs data in the format: 1.91557506E8. The Agilent X-series analyzer data output format is +2.12926028E+003. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

R

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|------------------------------------|--|--|---|
| | R1 | | *ESE32;*SRE32 | Same as RQS 32 - illegal command service request (see Page 105) |
| | R2 | | *ESE33;*SRE32 | Same as RQS 36 - end of sweep and illegal command service request (see Page 105) |
| | R3 | | *ESE40;*SRE32 | Same as RQS 40 - broken hardware and illegal command service request) |
| | R4 | | *ESE96;*SRE32 | Same as RQS 34 - units key pressed an illegal command service request. (see Page 105) There is no units key on the Agilent X-series analyzer. *ESE96 sets the SRQ if either the LOCAL key is pressed or an illegal command is received. |
| RB RB <value> RB AUTO RB UP DN RB? | RB RB UP DN RB? | RB RB <value> RB AUTO RB UP DN RB? | [[:SENSe]:BANDwidth BWIDth [:RESolution] <freq> [:SENSe]:BANDwidth BWIDth [:RESolution]:AUTO OFF ON 0 1 [:SENSe]:BANDwidth BWIDth [:RESolution]? | Specifies the resolution bandwidth. Manually sets the resolution bandwidth. AUTO parameters ON OFF are not available for the HP/Agilent 8590-Series spectrum analyzers. When AUTO is ON, the resolution bandwidth is automatically coupled to the frequency span. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent X-series analyzer outputs data in the format: 7.500000000E+08. |

- a. Added with 85620A mass memory module attached. c. No equivalent command for 8566B analyzer.
b. No equivalent command for 8568B analyzer. d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| | | RBR | [[:SENSe]:FREQuency:SPAN:BANDwidth[:RESolution]:RATio <integer> | Specifies the ratio between the resolution bandwidth and the frequency span. The X-series SCPI command uses the ratio of Span:3 dB RBW, whereas the 8560 E/EC command uses the ratio of 3 dB RBW:SPAN. |
| | RC | | *RCL <register #> | Same as RCLS (see Page 103) |
| | | RCLOSCAL | | Recalls averaged open/short reference trace data into trace B. |
| RCLS | RCLS | RCLS | *RCL <register #> | Recalls spectrum analyzer state data from one of nine state registers in spectrum analyzer memory. These registers do not appear in a FILE catalog. |
| RCLT | | RCLT | :MMEMory:LOAD:TRACe <label>,<file_name> | Recalls previously saved trace data, amplitude factors, or limit-line data from the trace registers in spectrum analyzer memory. These registers are specially mapped to named files. The contents of the file are loaded into the specified trace. See the LOAD command. |
| | | RCLTHRU | | Recalls a thru-reference trace into trace B. |
| RELHPIB | RELHPIB | RELHPIB ^a | | Releases spectrum analyzer control of the GPIB. |
| REPEAT... UNTIL | REPEAT... UNTIL | REPEAT... UNTIL ^a | | REPEAT/UNTIL forms a looping construct. |
| RESETRL | | | | Resets the reference level to instrument preset value. |

- a. Added with 85620A mass memory module attached. c. No equivalent command for 8566B analyzer.
 b. No equivalent command for 8568B analyzer. d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|---|---|--|---|
| RETURN | | RETURN ^a | | Stops the operation of a user-defined command and returns program operation to the point where the user-defined function was called. |
| REV REV? | REV | REV? | *IDN? | Returns the date code of the firmware revision number in YYMMDD format. The HP/Agilent 8590-Series and 8560 E/EC series analyzers return the firmware revision number date code in the format: 950129. The 8566B/8568B analyzers return the firmware revision in the format of YYWW, where YY is the number of years since 1960 and WW is the number of weeks from the beginning of the year. For example, "3114" would represent a revision with a build date in the 14th week of 1991 (e.g. 12 April 1991). The Agilent X-series analyzer returns the format: Agilent Technologies, N9020A, US45120125, A.01.00. |
| RL RL <value> RL UP DN RL? | RL RL <value> RL UP DN RL? | RL RL <value> RL UP DN RL? | :DISPlay:WINDow:TRACe:Y[:SCALe]: RLEVel <ampl> :DISPlay:WINDow:TRACe:Y[:SCALe]: RLEVel? | Specifies the amplitude value of the reference level. Sets the amplitude value of the reference level for the y-axis. The active window is assumed when no window is specified. The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent X-series analyzer outputs data in the format: 1.00E+01 |

- a. Added with 85620A mass memory module attached. c. No equivalent command for 8566B analyzer.
b. No equivalent command for 8568B analyzer. d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| | | RLCAL | :CALibration:RF | Calibrates the reference level. |
| RLPOS | | | :DISPlay:WINDow[1]:TRACe:Y[:SCALE]:NRPosition <integer> :DISPlay:WINDow[1]:TRACe:Y[:SCALE]:NRPosition? | Selects the position of reference level. |
| RMS | RMS | RMS ^a | | Returns the root mean square value of the trace in measurement units. |
| ROFFSET | ROFFSET | ROFFSET | :DISPlay:WINDow:TRACe:Y[:SCALE]:RLEVel:OFFSet <rel_ampl> | Offsets all amplitude readouts without affecting the trace. Sets the amplitude reference level for the y-axis. When no window is specified, the active window is assumed. The X-series command does not support offsets when the Y-axis unit is Volts, which was possible in the 8566B/8568B. |
| ROFFSET? | ROFFSET? | ROFFSET? | :DISPlay:WINDow:TRACe:Y[:SCALE]:RLEVel:OFFSet? | The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. The Agilent X-series analyzer outputs data in the format: 1.00E+01 |
| RQS | RQS | RQS | See *ESE and the STATus subsystem. | Sets a bit mask for service requests. |

- a. Added with 85620A mass memory module attached. c. No equivalent command for 8566B analyzer.
b. No equivalent command for 8568B analyzer. d. Option 002 only.

S

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| | S1 | S1 | | Same as CONTS (see Page 106) |
| | S2 | S2 | | Same as SNGLS (see Page 110) |
| | | SADD ^a | | Add a limit-line segment to the current limit line. |
| SAVEMENU | | | | Saves menu 1 under the specified menu number. |
| SAVES | SAVES | SAVES | *SAV <register #> :MMEMory:STORe:STATe <file_name> | Saves the currently displayed instrument state in spectrum analyzer memory. These registers do not appear in a FILE catalog. The only acceptable delimiter is a single quote('). Only traces and states are supported. Use only file extensions: .trace and .state. A disk drive name (typically D:) must be included in the file name. States and traces saved using HP/Agilent 8590-Series analyzers cannot be read by the Agilent X-series analyzers. |
| | | SAVES PWRON | :SYSTem:PRESet[:USER]:SAVE with :SYSTem:PON:TYPE USER | Saves the current state as the instrument power-on preset state. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|------------------------------------|---|--|---|
| SAVET SAVET TRA SAVET TRB SAVET TRC | | SAVET SAVET TRA SAVET TRB | :MMEMory:STORe:TRACe TRACE1 TRACE2 TRACE3,<file_name> | Saves the selected trace data and state information, (trace data only for 8560 E/EC Series) in spectrum analyzer memory. These registers are specially mapped to named files. The Agilent X-series analyzer saves only state information in registers using the *SAV and *RCL commands. The only acceptable delimiter is a single quote('). Only traces and states are supported. Use only file extensions: .trace and .state. A disk drive name (typically D:) must be included in the file name. States and traces saved using HP/Agilent 8590-Series analyzers cannot be read by the Agilent X-series analyzer. The FORMat:DATA command changes the data output format |
| SAVET LIMILINE SAVET AMPCOR | | | | |
| SAVRCLF | | | | Specifies either a save or recall operation. |
| SAVRCLN | | | | Specifies the number to append to the prefix for a save or recall operation, and initiates the transfer of data. |
| SAVRCLW | | | | Specifies the data to be transferred. |
| | | SDEL ^a | | Deletes the limit-line segment specified with the SEDI command. |
| | | SDON ^a | | Terminates the SEDI command. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| | | SEDI ^a | | Activates the limit-line segment you identify by its segment number in the limit-line table. |
| SEGDEL | | | | Deletes the specified segment from the limit-line tables. |
| SENER | | SENER ^a | | Enters the limit-line data in either the upper and lower limit-line tables or the mid and delta table for limit lines based on frequency. |
| SENER ^T | | | | Enters the limit-line data in either the upper and lower limit-line table or the mid and delta table for limit lines based on sweep time. |
| SER SER? | | SER? | *IDN? | <p>Returns the serial number suffix of the spectrum analyzer. For example, serial number 2725A00345 returns 00345.</p> <p>The HP/Agilent 8590-Series analyzer returns the serial number suffix in the format: 00345. The 8560-series analyzers returns the complete serial number: 2725A00345. The Agilent X-series analyzer returns the format: Agilent Technologies, N9020A, US27250345, A.01.00.</p> |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|--|
| SETDATE SETDATE? | | SETDATE ^a | :SYSTEM:DATE <year>,<month>,<day> :SYSTEM:DATE? | Sets the date of the real-time clock. Year is a 4-digit integer. Month is an integer 1 to 12. Day is an integer 1 to 31 (depending on the month). The HP/Agilent 8590-Series analyzer returns the instrument date in the format: YYMMDD. The Agilent X-series analyzer returns the format: +YYYY, +MM, +DD. |
| SETTIME SETTIME? | | SETTIME ^a | :SYSTEM:TIME <hour>,<minute>,<second> :SYSTEM:TIME? | Sets the time of the real-time clock. Hour must be an integer 0 to 23 (24-hr format) Minute must be an integer 0 to 59. Second must be an integer 0 to 59. The HP/Agilent 8590-Series analyzer returns the instrument time in the format: HHMMSS. The Agilent X-series analyzer returns the format: +HH, +MM, +SS. |
| | SIGDEL ^b | | | Specifies the maximum amplitude difference allowed between a signal and its image for the pair to be recognized by the signal identification routine (SIGID). |
| | SIGID ^b | SIGID | | Identifies signals for the external mixing frequency bands. |
| | | SHOWMENU ^a | | Displays labels in the softkey area of the display. Use SKYCLR/SKYDEF for labels. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|--|---|--|---|
| | | SKYCLR ^a | | Clears all user-defined softkeys set up in DLPs. |
| | | SKYDEF ^a | | Used inside a DLP to attach a program to a softkey label. |
| SMOOTH SMOOTH TRA SMOOTH TRB SMOOTH TRC | SMOOTH SMOOTH TRA SMOOTH TRB SMOOTH TRC | SMOOTH ^a SMOOTH TRA ^a SMOOTH TRB ^a | | Smooths the trace according to the number of points specified for the running average. |
| SNGLS | SNGLS | SNGLS | :INITiate:CONTinuous OFF 0 | Selects single-sweep mode. |
| SP SP <value> SP UP DN SP? | SP SP <value> SP UP DN SP? | SP SP <value> SP UP DN SP FULL SP ZERO SP LAST SP? | [:SENSe]:FREQuency:SPAN <freq> [:SENSe]:FREQuency:SPAN:FULL [:SENSe]:FREQuency:SPAN 0 Hz [:SENSe]:FREQuency:SPAN:PREVious [:SENSe]:FREQuency:SPAN? | Changes the total displayed frequency range symmetrically about the center frequency. Set the frequency span. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent X-series analyzer outputs data in the format: 7.500000000E+08. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| SPEAKER SPEAKER ON OFF | | | [[:SENSe]:SPEaker[:STATe] ON OFF 1 0 [:SENSe]:SPEaker[:STATe]?] | Turns the internal speaker on or off. The SCPI command requires N9063A, Analog Demodulation Measurement Application. |
| SPZOOM | | | :CALCulate:MARKer[1] 2 3 4:STATe OFF ON 0 1 :CALCulate:MARKer[1] 2 3 4: MAXimum :CALCulate:MARKer[1] 2 3 4:TRCKing [:STATe] OFF ON 0 1 | Places a marker on the highest on-screen signal (if an on-screen marker is not present), turns on the signal track function, and activates the span function. |
| SQLCH | | SQUELCH | | Sets the squelch threshold by setting the squelch level. |
| SQR | SQR | SQR ^a | | Places the square root of the source into the destination. |
| SRCALC | | SRCALC ^d | | Selects internal or external leveling for use with the built-in tracking generator. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|---|---|--|
| SRCAT | | | | Attenuates the source output level. |
| | | SRCRSTK ^d SRCFINTK ^d | | Adjusts the coarse tuning of the tracking generator oscillator. Adjusts the fine tuning of the tracking generator oscillator. |
| SRCNORM | | | | Subtracts trace B from trace A, adds the display line, and sends the result to trace A. |
| SRCPOFS SRCPOFS? | | SRCPOFS ^d SRCPOFS? ^d | | Offsets the source power level readout. |
| SRCPSTP SRCPSTP <real> SRCPSTP AUTO SRCPSTP? | | SRCSTP ^d SRCSTP <real> ^d SRCSTP? ^d | | Selects the source-power step size. Specifies the source power step size to be one vertical scale division. The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. |
| SRCPSWP SRCPSWP? | | SRCPSWP ^d | | Selects the sweep range of the source output. The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|-------------------------------------|--|--|---|
| SRCPWR SRCPWR? | | SRCPWR ^d | | Selects the source power level. The HP/Agilent 8590-Series analyzer outputs data in the format: 10.00. |
| SRCTK SRCTK? | | | | Adjusts tracking of source output with spectrum analyzer sweep (3.0 GHz tracking generator only). The HP/Agilent 8590-Series analyzer outputs data in the format: 2048. |
| SRCTKPK | | SRCTKPK ^d | | Adjusts tracking of source output with spectrum-analyzer sweep (3.0 GHz tracking generator only). |
| SRQ | SRQ | SRQ | See *ESE? and the STATus subsystem. | The SRQ command is used by an external controller to simulate interrupts from the spectrum analyzer. |
| SS SS <value> SS AUTO SS UP DN SS? | SS SS <value> SS UP DN SS? | SS SS <value> SS AUTO SS UP DN SS? | [[:SENSe]:FREQuency:CENTer:STEP[:INCRement] <freq> [:SENSe]:FREQuency:CENTer:STEP:AUTO OFF ON 0 1 [:SENSe]:FREQuency:CENTer:STEP[:INCRement]?] | Specifies center-frequency step size. Specifies center-frequency step size. Specifies whether the step size is set automatically based on the span. The HP/Agilent 8590-Series analyzer outputs data in the format: 750000000. The Agilent X-series analyzer outputs data in the format: 7.500000000E+08 |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|---|--|---|---|
| ST ST <value> ST AUTO ST UP DN ST? | ST ST <value> ST UP DN ST? | ST ST <value> ST AUTO ST UP DN ST? | [:SENSe]:SWEep:TIME <time> [:SENSe]:SWEep:TIME:AUTO OFF ON 0 1 [:SENSe]:SWEep:TIME? | Specifies the time in which the spectrum analyzer sweeps the displayed frequency (or time) range. Automatically selects the fastest sweep time for the current span. The HP/Agilent 8590-Series analyzer outputs data in the format: .500000. The Agilent X-series analyzer outputs data in the format: 5.0000000E-03. |
| STB? | | STB? | *STB? | Returns to the controller the decimal equivalent of the status byte. |
| STDEV | STDEV | STDEV ^a | :CALCulate:DATA<n>:COMPRESS? SDEViation[,<soffset>[,<length>[,<roffset>[,<rlimit>]]]] | Returns the standard deviation of the trace amplitude in measurement units. The SCPI command returns values in the same units as the trace data upon which it is operating. The value of n denotes the trace number. For example, a value of 1 indicates Trace 1 (equivalent to Trace A in the legacy analyzers). Trace 2 is equivalent to Trace B and Trace 3 is equivalent to Trace C. |
| STOR | | | | Stores data on a RAM card. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|--|---|---|
| | | STOREOPEN STORESHORT STORETHRU | | Saves the current instrument state and trace A in memory. It's used for open/short calibrations. Averages the current data in trace A with the "open" data. Then stores it in register 8. It's used for open/short calibrations. Stores a thru calibration trace in trace B and in state register 9. It's used for through-line calibrations. |
| SUB | SUB | SUB ^a | | |
| SUM | SUM | SUM ^a | | Returns the sum of the amplitudes of the trace elements in measurement units. |
| SUMSQR | SUMSQR | SUMSQR ^a | | Returns the sum of the squares of the amplitude of each trace element. |
| | SV | SV | | Same as SAVES (see Page 106) |
| | SW | | | Skips from the current address or the specified address to the next control word. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|---|---|--|
| SWPCPL SWPCPL SR SA SWPCPL? | | SWPCPL SWPCPL SR SA SWPCPL? | [[:SENSE]:SWEep:TIME:AUTO:RULes NORMa]SRESponse | Selects a stimulus-response (SR) or spectrum analyzer (SA) auto-coupled sweep time. Specifies the type of automatic coupling for the fastest sweep time at the current span. This varies based on the current measurement mode. This command returns SR or SA. The X-series SCPI command returns NORM or SRES. NORM is the equivalent of SA in the legacy command and SRES is the equivalent of SR in the legacy command. |
| | | SWPOUT RAMP FAV FAVA | | Selects the output for J8. (FAVA applies only to HP/Agilent 8564E/8565E.) |
| SYNCMODE | | | | Selects either the horizontal and vertical synchronizing constants, or the synchronization rate for the internal monitor. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

T

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| | T0 | | | Same as TH OFF (see Page 118) |
| | T1 | T1 | | Same as TM FREE (see Page 120) |
| | T2 | T2 | | Same as TM LINE (see Page 120) |
| | T3 | T3 | | Same as TM EXT (see Page 120) |
| | T4 | T4 | | Same as TM VID (see Page 120) |
| | T7 | | | Same as GATECTL LEVEL (see Page 60) |
| | T8 | | | Same as GATECTL EDGE (see Page 60) |
| TA | TA | TA | :TRACe[:DATA]? TRACE1 | Returns trace A amplitude values from the spectrum analyzer to the controller. Returns TRACE1 (trace A) amplitude values from the spectrum analyzer to the controller. |
| TB | TB | TB | :TRACe[:DATA]? TRACE2 | Returns trace B amplitude values from the spectrum analyzer to the controller. Returns TRACE2 (trace B) amplitude values from the spectrum analyzer to the controller. |

- a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

- c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|---|--|--|---|
| TDF TDF A B M I TDF P TDF? | TDF TDF A B M I TDF P TDF? | TDF TDF A B M I TDF P TDF? | :FORMat[:TRACe][:DATA] ASCii :FORMat[:TRACe][:DATA] ASCii INTEger,32 REAL,32 REAL,64 :FORMat[:TRACe][:DATA]? | Formats trace information for return to the controller. There is no direct equivalent for A, B, M or I formats. INTEger32 is very similar to the TDF A command, but provides twice the resolution (32 bits for INTEger32 vs 16 bits for TDF A). The queries TRA?, TRB?, and TRC? always return in TDF P format. |
| TEXT | TEXT | TEXT ^a | | Writes text on the analyzer screen at the current pen position. |
| TH TH <value> TH AUTO TH UP DN TH? | TH TH <value> THE ON OFF TH UP DN TH? | TH TH <value> TH ON OFF TH UP DN TH? | :CALCulate:MARKer[1] 2 3 4:PEAK: THReshold <value> | Clips signal responses below the threshold level. Specifies the minimum signal level for the analyzer peak identification routine to recognize as a peak. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|-----------------------------------|--|--|
| TIMEDATE TIMEDATE? | | TIMEDATE ^a | :SYSTem:TIME <hour>, <minute>, <second> :SYSTem:DATE <year>,<month>,<day> :SYSTem:DATE? :SYSTem:TIME? | Sets the time/date of the real-time clock (8590 Series). Turns the timedate display on or off (8560 E/EC Series) Year is a 4-digit integer. Month is an integer 1 to 12. Day is an integer 1 to 31. The HP/Agilent 8590-Series analyzer returns the timedate in the format: YYMMDDHHMMSS. The Agilent X-series analyzer returns the format: +YYYY, +MM, +DD for the date query, and +HH, +MM, +SS for the time query (24-hour format). Both queries must be sent to receive the same information given by the single HP/Agilent 8590 query. |
| TIMEDSP TIMEDSP? | | | | Turns the real-time clock display on or off. |
| TITLE | | TITLE | :DISPlay:ANNotation:TITLe:DATA <string> | Activates the screen title mode. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|--|--|---|--|
| TM | TM | TM | | Specifies trigger mode. |
| TM FREE TM VID TM LINE TM EXT | TM FREE TM VID TM LINE TM EXT | TM FREE TM VID TM LINE TM EXT | :TRIGger[:SEQuence]:SOURce IMMEDIATE VIDeo LINE EXTernal[1] EXTernal2 | Specifies the source (or type) of triggering used to start a measurement. Immediate is free-run triggering. Video triggers on the video signal. Line triggers on the power line signal. External allows you to connect an external trigger source. In the SCPI command, IMMEDIATE is the equivalent of Free Run. On the 8566B/8568B, if the sweep time is <20 ms (fast zero span, where the trace is not digitized), the display is refreshed periodically, as if the trigger mode were set to free run, even if no trigger is present in the case of video or external trigger. This prevents the display from being completely blank when no trigger is present. In the X-series, traces are always digitized, so the display is not blanked, but a sweep is not triggered unless a trigger event occurs. It is possible, however, to use the Auto Trigger feature to force a sweep to be taken if a trigger event does not occur. Refer to the :TRIGger[:SEQuence]:ATRigger <time> and :TRIGger[:SEQuence]:ATRigger:STATe OFF ON 0 1 commands. |
| TM? | TM? | TM? | :TRIGger[:SEQuence]:SOURce? | The HP/Agilent 8590-series, 8566B/8568B, and 8560 E/EC series analyzers output: FREE, VID, LINE, or EXT. The Agilent X-series analyzer outputs: IMM, VID, LINE, EXT1, or EXT2. |

- a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

- c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|--|---|
| TOI | | | | Turns the third-order intermodulation (TOI) measurement on or off. |
| TOIR | | | | Returns the highest third-order intermodulation product measured by the third-order intermodulation measurement (TOI). |
| TRA TRB TRC | TRA TRB TRC | TRA TRB | :TRACe[:DATA] TRACE1 TRACE2 TRACE3, <ASCII data or definite_length_block> | Controls trace data input or output. Transfers the trace data from the controller to the instrument. The query reads trace data out of the instrument. The data is in a machine readable format that the analyzer understands. |
| TRA? | | TRA? | :TRACe[:DATA]? TRACE1 TRACE2 TRACE3 | The data format for the command and query is always TDF P. |
| TRB? | | TRB? | | The HP/Agilent 8590-Series analyzer returns data in the format: -57.71, -58.12, -56.87. The Agilent X-series analyzer returns data in the format: -5.46380000E+001, -5.44410000E+001, -5.47590000E+001. This is an example of IEEE NR3 numeric response data. |
| TRC? | | | | |
| TRCMEM | | | | Returns a non-negative integer that indicates the total number of trace registers available for SAVET and RCLT. |
| TRDEF | TRDEF | TRDEF ^a | | Creates a user-defined trace. |
| TRDSP | TRDSP | | | Turns the display of trace A, B, or C on or off. It does this without clearing the trace (measurements can still be taken). |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| TRGRPH | TRGRPH | | | Displays a compressed trace on the analyzer display. |
| | | TRIGPOL | :TRIGger:SLOPe POSitive NEGative | Selects the edge (pos or neg) of the trigger input that causes the trigger event. |
| TRMATH | TRMATH | | | Executes a list of analyzer commands at the end of each sweep. |
| TRPRST | TRPRST | | | Sets the trace operations to their preset values. |
| TRSTAT | TRSTAT | | :TRACe[1] 2 3:MODE? | <p>Returns the status of traces A, B, and C: clear write, blank, view, minimum hold, or maximum hold.</p> <p>Traces are: TRACE[1] 2 3. TRACE1 corresponds to trace A, TRACE2 corresponds to trace B, and TRACE3 corresponds to trace C.</p> <p>The HP/Agilent 8590-Series analyzer returns the format: CLRW A;BLANK B;BLANK C;. The Agilent X-series analyzer returns the format: WRIT;BLAN;BLAN. All three traces in the analyzer will be queried, with an EOI after each response.</p> |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|---|
| TS | TS | TS | :INITiate:IMMediate | Starts and completes one full sweep before the next command is executed. This command restarts the current sweep or measurement or set of averaged/held sweeps or measurements. If you are paused, this command does a resume. |
| TVLINE | | | | Sets the line number of the horizontal line of video on which to trigger. |
| TVSFRM | | | | Specifies type of video frame to trigger on. |
| TVSTND | | | | Selects the triggering for the various formats available. |
| TVSYNC | | | | Selects between negative and positive triggering for video frame formats. |
| TWNDOW | TWNDOW | TWNDOW | | Creates a window trace array for the fast Fourier transform (FFT) function. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

U - Z

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| UP | | | | <p>This command increases the active function by the applicable step size.</p> <p>There is no equivalent command in SCPI but you can implement the command by using UP or DOWN as a SCPI parameter in the equivalent SCPI command. For example, in the 8590-Series analyzers, if CF is the active function, you can send UP;UP;UP to increment the center frequency by three times the step size. To do the same in SCPI you send :SENS:FREQ:CEN UP three times.</p> |
| u | UR | | | Provides the upper right x-y recorder output voltage at the rear panel. |
| USTATE | USTATE | | | Transmits information that has been stored in the analyzer by the user. |
| VARDEF | VARDEF | VARDEF ^a | | Creates a user-defined variable and assigns it a value. |
| VARIANCE | VARIANCE | VARIANCE ^a | | Returns the amplitude variance of the specified trace, in measurement units. |

a. Added with 85620A mass memory module attached.

b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.

d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|-------------------------------|------------------------------------|-----------------------------------|---|--|
| VAVG | VAVG | VAVG | | Enables the video-averaging function, which averages trace points to smooth the displayed trace. |
| VAVG <number> | VAVG <number> | VAVG <number> | [[:SENSe]:AVERage:COUNT <integer> | Specifies the number of measurements that are combined. |
| VAVG ON OFF | VAVG ON OFF | VAVG ON OFF | [[:SENSe]:AVERage[:STATe] OFF ON 0 1 | Specifies the number of measurements that are combined. The value of successive measurements can be combined together to average out measurement variations. |
| VAVG? | | VAVG UP DN VAVG? | [[:SENSe]:AVERage:COUNT? | The HP/Agilent 8590-series, 8566B/8568B and 8560 E/EC series analyzers return the count in the format: 100 (the current average setting) when VAVG is ON, and returns 0 when VAVG is OFF. The Agilent X-series analyzer returns the terminal count number, N, whether the trace is being averaged or not. Query the average state to determine whether or not the trace is being averaged. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|--|---|--|---|--|
| VB VB <value> VB AUTO VB UP DN VB? | VB VB <value> VB UP DN VB? | VB VB <value> VB AUTO MAN VB UP DN VB? | [:SENSe]:BANDwidth BWIDth:VIDeo <freq> [:SENSe]:BANDwidth BWIDth:VIDeo: AUTO OFF ON 0 1 [:SENSe]:BANDwidth BWIDth:VIDeo? | Specifies the video bandwidth. Couples the video bandwidth to the resolution bandwidth. The HP/Agilent 8590-series, the 8566B/8568B and the 8560 E/EC series analyzers output data in the format: 750000000. The Agilent X-series analyzer outputs data in the format: +750000000. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---|------------------------------------|---|--|--|
| VBR VBR <value> VBR UP DN VBR? | VBO | VBR VBR <value> VBR UP DN VBR? | [:SENSe]:BANDwidth BWIDth:VIDeo:RATio <number> [:SENSe]:BANDwidth BWIDth:VIDeo:RATio? | <p>Specifies coupling ratio of video bandwidth to resolution bandwidth.</p> <p>Specifies the ratio of the video bandwidth to the resolution bandwidth. This parameter is multiplied by the resolution bandwidth to determine the automatic setting of the video bandwidth.</p> <p>Specifies the offset between the video bandwidth and the resolution bandwidth. For example: an entry of +1 sets the video bandwidth one bandwidth step wider than the resolution bandwidth (assumes a 1-3-10 sequence for RBW and VBW).</p> <p>The HP/Agilent 8590-Series and the 8560-series analyzers output data in the format: .3000000. The Agilent X-series analyzer outputs data in the format: +3.00000000E-001.</p> |
| VIEW TRA TRB TRC | VIEW TRA TRB TRC | VIEW TRA TRB | TRACe[1] 2 3:MODE VIEW | Displays trace A, trace B, or trace C, and stops taking new data into the viewed trace. |
| | | VTL VTL <ampl> VTL UP DN VTL? | TRIGger:VIDeo:LEVel <ampl> TRIGger:VIDeo:LEVel? | Sets the level for video trigger. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

| 8590-Series Analyzer Commands | 8566A/B, 8568A/B Analyzer Commands | 8560E/EC-Series Analyzer Commands | Corresponding X-series Analyzer SCPI Commands | Description/Comments |
|---------------------------------------|------------------------------------|-----------------------------------|---|--|
| WAIT | | | | Suspends all spectrum analyzer operation for the specified time duration. |
| WINNEXT | | | | Makes the window that is currently not the active window, active. |
| WINOFF | | | | Turns off the windows display. |
| WINON | | | | Activates the windows display mode. |
| WINZOOM | | | | Expands the size of the active window so that it fills the entire spectrum analyzer display. |
| XCH XCH TRA TRB TRC TRA TRB TRC | XCH | | :TRACe:EXCHange <trace_1>,<trace_2> | Exchanges traces. Exchanges two traces, point by point. Trace_1 choices are: TRACE[1] 2 3 Trace_2 choices are: TRACE[1] 2 3 |
| ZMKCNTR | | | | Positions the zone marker at the specified frequency. |
| ZMKPKNL | | | | Places the zone marker at the next signal peak that is left of the current position of the zone marker. |
| ZMKPKNR | | | | Places the zone marker at the next signal peak that is left of the current position of the zone marker. |
| ZMKSPAN | | | | Allows you to change the width of the zone marker. |

a. Added with 85620A mass memory module attached.
b. No equivalent command for 8568B analyzer.

c. No equivalent command for 8566B analyzer.
d. Option 002 only.

How to Represent Units

| HP/Agilent 8590-Series Analyzers | HP 8566A/B and 8568A/B Analyzer | HP/Agilent 8560E/EC Series Analyzers | X-series Analyzers |
|----------------------------------|---------------------------------|--------------------------------------|--------------------|
| HZ | HZ | HZ | HZ |
| KZ, KHZ | KZ | KZ, KHZ | KHZ |
| MZ, MHZ | MZ | MZ, MHZ | MHZ |
| GZ, GHZ | GZ | GZ, GHZ | GHZ |
| DB | DB | DB | DB |
| DM, DBM | DM, DBM | DM, DBM | DBM |
| DBMV | DBMV | DBMV | DBMV |
| DBUV | DBUV | DBUV | DBUV |
| V | V | V | V |
| MV | MV | MV | MV |
| UV | UV | UV | UV |
| W, MW, UW | | MW | W |
| SC | SC | S, SC | S |
| MS | MS | MS | MS |
| US | US | US | US |
| A | | A | |
| MA | | MA | |
| UA | | UA | |

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