## **SCPI Command Summary**

This chapter describes all *device* commands recognized by the analyzer. Example programs using these commands are given in the *Example Programs Guide*. IEEE 488.2 *common* commands are described in Chapter 9, "Introduction to SCPI."

## **Queries, Forms, and Parameter Types**

All device commands have both command and query forms unless specified as command only or query only. To create the query form of a command, replace the command parameter with a "?". For example, the following command and parameter selects the log magnitude format (MLOGarithmic) for the data display:

```
CALCulate[1|2]:FORMat:MLOGarithmic
```

To find which format is active, use the corresponding query command:

```
CALCulate[1|2]:FORMat?
```

The analyzer returns the short form of the mnemonic for the active state or value. In this example, the string MLOG (the short-form of MLOGarithmic) is returned to the device that sent the query.

<num>, <char>, <string> and <block> refer to the parameter type expected by the instrument as part of the command.

## **Parameter Types**

In the following tables, the **FORM** column gives the **parameter type** returned by the instrument in response to a query. NR1, NR2 and NR3 refer to the different types of numeric data. CHAR (character data), STRING (string data) and BLOCK (block data) are also used to describe response types. The parameter types expected by the instrument as part of a command are summarized below:

NR1	Integers (such as +1, 0, -1, 123, -12345)
NR2	Floating point numbers with an explicit decimal point (such as 12.3, $+1.234$ , $-0.12345$ )
NR3	Floating point numbers in scientific notation (such as +1.23E+5, +123.4E-3, -456.789E+6)
CHAR	Character parameters (sometimes referred to as discrete parameters) consisting of ASCII characters. They are typically used for program settings that have a finite number of values.
STRING	String parameters can contain virtually any set of ASCII characters. The string must begin with a single quote ( ' ) or a double quote ( " ) and end with the same character.
BLOCK	Block parameters are typically used to transfer large quantities of related data (like a data trace).

Some numeric parameters may be followed by an appropriate suffix. Commands that accept a suffix also allow standard metric multipliers to be combined with the suffix. For example, commands that set a frequency will accept HZ, KHZ, MHZ and GHZ. Commands that set a time will accept S, MS, US, NS, PS, FS and AS. Note that case is ignored. The multiplier "M" is interpreted as either milli-  $(10^{-3})$  or mega-  $(10^{6})$ , depending on context. If no suffix is included, the default units for the parameter are used.

## **SCPI Device Command Summary**

NOTEThis SCPI command reference is also available online. It is stored inside<br/>your analyzer in electronic form. To use it, you must connect your<br/>instrument to the network, and access it using your Web browser. See<br/>the The LAN Interface User's Guide Supplement for details.

#### Table 10-28ABORt

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
ABORt	command only	Aborts and resets the sweep in progress.

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALCulate[1 2]:DATA? <sup>1</sup>	query only BLOCK or NR3 <sup>2</sup>	Queries the formatted data trace — functionally equivalent to the command TRAC? CH<1   2>FDATA.
CALCulate[1 2]:FORMat <char></char>	CHAR	Selects the display format for measurement data — choose from MLOGarithmic   MLINear   SWR or PHASe   SMITh   POLar   GDELay   REAL   IMAGinary   MIMPedance.
CALCulate[1 2]:FORMat :UNIT:MLIN <char></char>	CHAR	Selects linear magnitude units for Y-axis display. Choose from $W   MW   UW   V   MV   UV$ .
CALCulate[1 2]:FORMat :UNIT:MLOG <char></char>	CHAR	Selects log magnitude units for Y-axis display. Choose from DBW   DBM   DBUW   DBV   DBMV   DBUV.
CALCulate[1 2] :GDAPerture:APERture <num></num>	NR3	Sets the group delay aperture as a ratio of desired aperture / measured frequency span.
CALCulate[1 2] :GDAPerture:SPAN <num></num>	NR3	Specifies the group delay aperture in Hertz.

CALCulate (1 of 7)

**Table 10-29** 

1. Refer to Chapter 6, "Trace Data Transfers," and to the ASCDATA and REALDATA example programs in the *Example Programs Guide* for more information on this command.

2. The parameter type of the data is determined by the format selected — FORMat REAL uses BLOCK data, FORMat ASCii uses NR3 data separated by commas.

## Table 10-29CALCulate (2 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALCulate[1 2]:LIMit:DISPlay <on off><sup>1</sup></on off>	NR1	Turns display of limit lines on/off.
CALCulate[1 2]:LIMit:MARKer :FLATness:MAXimum <num></num>	NR3	Sets the maximum value for a flatness limit test.
CALCulate[1 2]:LIMit:MARKer :FLATness:MINimum <num></num>	NR3	Sets the minimum value for a flatness marker limit test.
CALCulate[1 2]:LIMit:MARKer :FLATness:STATe <on off><sup>1</sup></on off>	NR1	Turns flatness marker limit test on/off .
CALCulate[1 2]:LIMit:MARKer :FREQuency:MAXimum <num><sup>2</sup></num>	NR3	Sets the maximum value for delta frequency marker limit test.
CALCulate[1 2]:LIMit:MARKer :FREQuency:MINimum <num><sup>2</sup></num>	NR3	Sets the minimum value for delta frequency marker limit test.
CALCulate[1 2]:LIMit:MARKer :FREQuency [:STATe] <on off><sup>1</sup></on off>	NR1	Turns delta frequency marker limit testing on or off.
CALCulate[1 2]:LIMit:MARKer :STATistic:MEAN:MAXimum <num></num>	NR3	Sets the maximum value for a statistic mean limit test.
CALCulate[1 2]:LIMit:MARKer :STATistic:MEAN:MINimum <num></num>	NR3	Sets the minimum value for a statistic mean limit test.
CALCulate[1 2]:LIMit:MARKer :STATistic:MEAN:STATe <on off><sup>1</sup></on off>	NR1	Turn statistic mean marker limit test on/off .
CALCulate[1 2]:LIMit:MARKer :STATistic:PEAK:MAXimum <num></num>	NR3	Sets the maximum value for a statistic peak-to-peak limit test.
CALCulate[1 2]:LIMit:MARKer :STATistic:PEAK:MINimum <num></num>	NR3	Sets the minimum value for a statistic peak-to-peak limit test.

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is assumed.

#### Table 10-29CALCulate (3 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALCulate[1 2]:LIMit:MARKer :STATistic:PEAK:STATe <on off><sup>1</sup></on off>	NR1	Turns statistic peak-to-peak marker limit test on/off .
CALCulate[1 2]:LIMit:MARKer :TILT:MAXimum <num><sup>2</sup></num>	NR3	Sets the maximum value for delta amplitude marker limit test.
CALCulate[1 2]:LIMit:MARKer :TILT:MINimum <num><sup>2</sup></num>	NR3	Sets the minimum value for delta amplitude marker limit test.
CALCulate[1 2]:LIMit:MARKer :TILT [:STATe] <on off><sup>1</sup></on off>	NR1	Turns delta amplitude marker limit testing on or off.
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:AMPLitude:STARt <num><sup>2</sup></num>	NR3	Sets the Begin Limit for the specified limit segment.
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:AMPLitude:STOP <num><sup>2</sup></num>	NR3	Sets the End Limit for the specified limit segment.
CALCulate[1 2]:LIMit:SEGMent :AOFF	command only	Turns off all limit segments for a given channel — deletes all segments in the channel's limit table.
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:DISTance:STARt <num><sup>2</sup></num>	NR3	Sets the Begin Distance for the specified limit segment. (Option 100 only)
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:DISTance:STOP <num><sup>2</sup></num>	NR3	Sets the End Distance for the specified limit segment. (Option 100 only)
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:FREQuency:STARt <num><sup>2</sup></num>	NR3	Sets the Begin Frequency for the specified limit segment.

- 1. Binary parameters accept the values of  $\boldsymbol{1}$  (on) and  $\boldsymbol{0}$  (off) in addition to ON and OFF .
- 2. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is assumed.

## Table 10-29CALCulate (4 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:FREQuency:STOP <num><sup>2</sup></num>	NR3	Sets the End Frequency for the specified limit segment.
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:POWer:STARt <num><sup>2</sup></num>	NR3	Sets the Begin Power for the specified limit segment.
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:POWer:STOP <num><sup>2</sup></num>	NR3	Sets the End Power for the specified limit segment.
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:STATe <on off><sup>1</sup></on off>	NR1	Turns the specified limit segment on/off — adds or deletes the segment.
CALCulate[1 2]:LIMit:SEGMent [1 2 12]:TYPE <char></char>	CHAR	Sets the limit type for the specified segment, choose from LMAX   LMIN   PMAX   PMIN (Max Line, Min Line, Max Point, Min Point) — sets all of the segment's limit parameters to their default values.
CALCulate[1 2]:LIMit:STATe <on off><sup>1</sup></on off>	NR1	Turns the limit test on/off .
CALCulate[1 2]:MARKer:AOFF	comma ndonly	Turns off all markers for a given channel — this has the effect of turning off marker functions and tracking as well.
CALCulate[1 2]:MARKer:BWIDth <num><sup>2</sup></num>	NR3	Calculates the bandwidth of a bandpass filter — num is the target bandwidth (–3 for the 3 dB bandwidth).

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is assumed.

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALCulate[1 2]:MARKer :FUNCtion:RESult?	query only NR3 [,NR3, NR3, NR3]	Queries the results of the active marker function — MAX and MIN return the amplitude; TARG returns the frequency; BWID returns bandwidth, center frequency, Q and loss; STAT returns the frequency span, the mean and standard deviation of the amplitude response, and the peak-to-peak ripple; FLAT returns the frequency span, gain, slope and flatness; and FSTAT returns the insertion loss and peak-to-peak ripple of the passband of a filter, as well as the maximum signal amplitude in the stopband. Refer to the MARKERS example program in the <i>Example</i> <i>Programs Guide</i> for more information.
CALCulate[1 2]:MARKer :FUNCtion[:SELect] <char></char>	CHAR	Selects the active marker function — choose from OFF  MAXimum  MINimum   TARGet  BWIDth   NOTCh   MPEak   MNOTch  STATistics   FLATness   FSTATistics.
CALCulate[1 2]:MARKer :FUNCtion:TRACking <on off><sup>1</sup></on off>	NR1	Turn marker function tracking on/off .
CALCulate[1 2]:MARKer [1 2 8]:GDELay?	query only	Returns the group delay value, in seconds, at the specified marker.
CALCulate[1 2]:MARKer [1 2 8]:MAXimum	command only	Sets the specified marker to the maximum value on the trace.
CALCulate[1 2]:MARKer [1 2 8]:MAXimum:LEFT	command only	Moves the specified marker to the next local maximum to the left.

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

#### Table 10-29CALCulate (6 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALCulate[1 2]:MARKer [1 2 8]:MAXimum:RIGHt	command only	Moves the specified marker to the next local maximum to the right.
CALCulate[1 2]:MARKer [1 2 8]:MINimum	command only	Sets the specified marker to the minimum value on the trace.
CALCulate[1 2]:MARKer [1 2 8]:MINimum:LEFT	command only	Moves the specified marker to the next local minimum to the left.
CALCulate[1 2]:MARKer [1 2 8]:MINimum:RIGHt	command only	Moves the specified marker to the next local minimum to the right.
CALCulate[1 2]:MARKer :MODE <char></char>	CHAR	Turns delta marker state on/off — choose ABSolute or RELative.
CALCulate[1 2]:MARKer :NOTCh <num><sup>3</sup></num>	NR3	Calculates the notch width of a notch filter — num is the target notch width (-6 for the 6dB bandwidth).
CALCulate[1 2] :MARKer[1 2 8]:POINt <sup>1</sup>	NR3	Sets the specified marker point.
CALCulate[1 2] :MARKer:REFerence:X?	query only NR3	Queries the frequency of the reference marker.
CALCulate[1 2] :MARKer:REFerence:Y?	query only NR3	Queries the amplitude of the reference marker.
CALCulate[1 2] :MARKer[1 2 8][:STATe] <on off><sup>2</sup></on off>	NR1	Turns the specified marker on/off .
CALCulate[1 2] :MARKer[1 2 8]:TARGet <char>,<num><sup>3</sup></num></char>	CHAR, NR3	<b>Performs a marker search for a target</b> <b>value</b> — char <b>is the direction</b> LEFT <b>or</b> RIGHt.

- 1. Refer to "Displaying Measurement Results" in Chapter 7 of the *User's Guide* for more information on using this command.
- 2. Binary parameters accept the values of 1 (on) and 0 (off) in addition to  ${\tt ON}$  and  ${\tt OFF}$  .
- 3. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is assumed.

#### Table 10-29CALCulate (7 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALCulate[1 2] :MARKer[1 2 8]:X <num></num>	NR3	Sets the specified marker frequency (or power if in power sweep).
CALCulate[1 2] :MARKer[1 2 8]:X:ABS <num></num>	NR?	Sets a marker to an absolute value (such as frequency or amplitude). The set value is not relative to a reference marker if one is enabled.
CALCulate[1 2] :MARKer[1 2 8]:Y?	query only NR3	Queries the specified marker amplitude.
CALCulate[1 2] :MARKer[1 2 8]:Y:INDuctance?	query only NR3	Queries the specified marker's inductance when in Smith chart format.
CALCulate[1 2] :MARKer[1 2 8]:Y:MAGNitude?	query only NR3	Queries the specified marker's magnitude when in polar format.
CALCulate[1 2] :MARKer[1 2 8]:Y:PHASe?	query only NR3	Queries the specified marker's phase value when in polar format.
CALCulate[1 2] :MARKer[1 2 8]:Y:REACtance?	query only NR3	Queries the specified marker's reactance value when in Smith chart format.
CALCulate[1 2] :MARKer[1 2 8]:Y:RESistance?	query only NR3	Queries the specified marker's resistance value when in Smith chart format.
CALCulate[1 2] :MATH[:EXPRession] <expr> 1</expr>	EXPR	Selects a trace math expression — choose measurement trace from (IMPL) for "data only" or (IMPL/CH<1 2>SMEM) for "data / memory".

1. <expr> and EXPR represent expressions, a parameter type that consists of mathematical expressions that use character parameters and are enclosed in parentheses.

### Table 10-30CALibration

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CALibration :SELF:ALL	command only	Initiates a SelfCal on all ports that were calibrated during the Test Set Cal. <sup>1</sup>
CALibration :SELF <on off once><sup>2</sup></on off once>	NR1 CHAR	Initiates a SelfCal on the currently selected ports and selects Periodic SelfCal (ON) or SelfCal Once (OFF or ONCE). <sup>1</sup>
CALibration :SELF:TIMER <num></num>	NR1	Sets the time interval for automatic SelfCals. <sup>1</sup>
CALibration :ZERO:AUTO <on off once><sup>2</sup></on off once>	NR1	Turns the broadband detector autozeroing function on/off .

1. For use with multiport test sets only.

2. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CONFigure <string></string>	STRING	Configures the analyzer to measure a specific
		device type and parameter (the BEGIN)
		function) — choose from one of the following
		strings:
		'AMPLifier:TRANsmission'
		'AMPLifier:REFLection'
		'AMPLifier:TRANsmission:REVerse'
		<sup>1</sup> 'AMPLifier:REFLection:REVerse'
		'AMPLifier:POWer'
		'FILTer:TRANsmission'
		'FILTer:REFLection'
		BBANd: TRANsmission'
		''BBANd:TRANsmission:REVerse'
		<sup>1</sup> 'BBANd:REFLection:REVerse'
		'MIXer:CLOSs'
		'MIXer:GDEL'
		'MIXer:REFLection'
		'CABLE: SRL'
	1	1

#### Table 10-31CONFigure

1. For use with HP8712ES and HP8714ES only.

#### Table 10-32CONTrol

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
CONTrol[1 2]:MULTiport :STATE <on off></on off>	NR1	When on, configures analyzer for use with a multiport test set. $^{\rm 1}$

1. For use with multiport test sets only.

### Table 10-33DIAGnostic (1 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DIAGnostic:CCONstants:INSTalled?	query only NR1	Queries if correction constants are installed in flash. Returns a 1 if true, and a 0 if false.
DIAGnostic:CCONstants:LOAD	command only	Loads default factory calibration constants from floppy disk to memory.
DIAGnostic:CCONstants:STORE:DISK	command only	Stores default factory calibration constants from memory to floppy disk.
DIAGnostic:CCONstants:STORE :EEPRom	command only	Stores default factory calibration constants from memory to flash EEPROM.

### Table 10-33DIAGnostic (2 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DIAGnostic:COMMunicate:LAN:PING :IMM	command only	"Pings" a remote user-specified IP address. Used in troubleshooting or verifying a LAN connection.
DIAGnostic:COMMunicate:LAN:PING :IPAD <string></string>	STRING	Sets the IP address to ping.
<pre>DIAGnostic:COMMunicate:LAN:SEND <ip_address>,<port_num>,<string>, <timeout></timeout></string></port_num></ip_address></pre>	NR1, STRING	Instructs the analyzer to open a socket to the specified IP address and port number, and send the string specified. <timeout> is an integer <num> in the range 0-75 specifying the number of seconds allocated for a successful transmission. If 0 is specified, a minimum interval of 0.10 seconds is used. If <timeout> is not specified, the default interval of 75 seconds is used. DIAGnostic:COMMunicate:LAN :SEND?returns 0 if the <i>last</i> socket connection was successful, and -1 if the <i>last</i> socket connection failed. This may not be the last socket connection made by the IBASIC program. Multiple socket connections are possible, and telnet sessions may be interspersed among programmed socket connections</timeout></num></timeout>

Table 10-33	DIAGnostic (3 of 4)
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SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DIAGnostic:MDISplay[1 2] :CORRection <string></string>	command only	Displays corrected measurement uncertainties. Choose from one of the following strings:
		Calcheck C_DIRECTivity C_LDMATCH C_ISOLATION C_RTRACKING C_SRCMATCH C_TTRACKING
		Interpolated Array (accessed through the service menu.) I_DIRECTivity I_RESPONSE I_SRCMATCH I_TRACKING I_LDMATCH
		Master Array (accessed through the service menu.) M_DIRECTivity M_RESPONSE M_SRCMATCH M_TRACKING M_XSCALAR M_LDMATCH
DIAGnostic:MDISplay[1 2] :RESTore	command only	Returns to measurement mode and autoscales after viewing calibration uncertainties.
DIAGnostic:PORT:READ? <port><register><sup>1</sup></register></port>	query only NR1, NR1	Reads the rear panel I/O ports.

1. Refer to "Controlling Peripherals" in Chapter 7 of the *User's Guide* for more information on using this command. See also Table 10-34 and Table 10-35.

Table 10-33	DIAGnostic (4 of	4)
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SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DIAGnostic:PORT:WRITE <port><register><sup>1</sup></register></port>	NR1, NR1, NR1	Writes to the rear panel I/O ports.
DIAGnostic:SNUMber <string>?</string>	query only STRING	Queries the instrument's serial number.
DIAGnostic:SPUR:METHod <none dither avoid></none dither avoid>	NR1	Selects the spur avoid mode.

1. See "Controlling Peripherals" in Chapter 7 of the User's Guide for more information on using this command. See also Table 10-34 and Table 10-35.

Port Number	Register	Description
15	0	Outputs 8-bit data to the Cent_D0 through D7 lines of the Centronics port. Cent_D0 is the least significant bit, Cent_D7 is the most significant bit. Checks Centronics status lines for:
		Out of Paper
		Printer Not on Line
		• BUSY
		ACKNOWLEDGE
15	1	Sets/clears the user bit according to the least significant bit of A. A least significant bit equal to 1 sets the user bit high. A least significant bit of 0 clears the user bit.
15	2	Sets/clears the limit pass/fail bit according to the least significant bit of A. A least significant bit equal to 1 sets the pass/fail bit high. A least significant bit of 0 clears the pass/fail bit.
15	3	Outputs 8-bit data to the Cent_D0 through D7 lines of the Centronics port. Cent_D0 is the least significant bit, Cent_D7 is the most significant bit. Does not check Centronics status lines.
9	0	Outputs a byte to the serial port. The byte is output serially according to the configuration for the serial port.

Table 10-34Writeable Ports

When using the WRITEIO(15,0) or WRITEIO(15,3) command, the Printer\_Select Line is set high. However, when the instrument is doing hardcopy, the Printer\_Select Line is set low. The Printer\_Select line may or may not be used by individual printers. Check with your printer manual.

NOTE

Port Number	Register	Description
9	0	Reads the serial port.
15	0	Reads the 8-bit data port Cent_D0 through D7.
15	1	Reads the user bit.
15	2	Reads the limit test pass/fail bit.
15	10	Reads the 8-bit status port.
		D0 — Cent_acknowledge
		D1 — Cent_busy
		D2 — Cent_out_of_paper
		D3 — Cent_on_line
		D4 — Cent_printer_err

#### Table 10-35Readable Ports

### Table 10-36DISPlay (1 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DISPlay:ANNotation:CHANnel[1  2][:STATe] <off on><sup>1</sup></off on>	NR1	Enables/disables measurement channel annotation.
DISPlay:ANNotation :CHANnel[1 2]:USER:LABel:DATA <string><sup>2</sup></string>	STRING	Specifies the string to be displayed in the measurement channel annotation area (above the graticule).
DISPlay:ANNotation :CHANnel[1 2]:USER:STATe <off  ON&gt;<sup>1,2</sup></off  	NR1	Enables user-defined measurement channel annotation.
DISPlay:ANNotation:CLOCk :DATE:FORMat <char></char>	CHAR	Selects the Year/Month/Day ordering of the date in the clock display — choose from YMD   MDY   DMY.
DISPlay:ANNotation:CLOCk :DATE:MODE <char></char>	CHAR	Selects the format for the date in the clock display — choose NUMeric or ALPHa.
DISPlay:ANNotation:CLOCk :MODE <char></char>	CHAR	Selects how the clock will appear in the measurement display title area — choose from LINE1   LINE2   OFF.
DISPlay:ANNotation:CLOCk :SEConds[:STATe] <on off><sup>1</sup></on off>	NR1	Turns on/off display of seconds in the clock display.
DISPlay:ANNotation :FREQuency[1 2]:MODE <char></char>	CHAR	Sets the frequency annotation on the display — choose SSTOP (start/stop), CSPAN (center/span) or CW.
DISPlay:ANNotation :FREQuency[1 2]:RESolution <char></char>	CHAR	Sets the resolution of display frequency values — choose from MHZ   KHZ   HZ.
DISPlay:ANNotation:FREQuency [1 2] [:STATe] <off on><sup>1</sup></off on>	NR1	Enables/disables frequency annotation.
DISPlay:ANNotation:FREQuency [1 2]:USER:LABel:DATA <string></string>	STRING	A user-defined X-axis label.

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. Refer to "Displaying Measurement Results" in Chapter 7 of the *User's Guide* for more information on using this command.

#### Table 10-36DISPlay (2 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DISPlay:ANNotation:FREQuency [1 2]:USER:STARt <num><sup>2</sup></num>	NR3	Specifies the start value for user-defined frequency annotation.
DISPlay: ANNotation: FREQuency $[1 2]: USER: STATe[OFF ON]^{1,2}$	NR1	Enables user-defined frequency annotation.
DISPlay:ANNotation:FREQuency [1 2]:USER:STOP <num><sup>2</sup></num>	NR3	Specifies the stop value for user-defined frequency annotation.
DISPlay:ANNotation:FREQuency [1 2]:USER:SUFFix[:DATA] <string><sup>2</sup></string>	STRING	Specifies the suffix for user defined frequency annotation.
DISPlay:ANNotation:LIMit:ICON [1 2]:FLAG[:STATe] <on off><sup>1</sup></on off>	NR1	Enables/disables the display of the limit test fail icon.
DISPlay:ANNotation:LIMit:ICON [1 2] :POSition:X <num></num>	NR1	Positions the limit test pass/fail text and icon on the display. Accepts whole number values from 0 (flush left) to 100 (flush right).
DISPlay:ANNotation:LIMit:ICON [1 2] :POSition:Y <num></num>	NR1	Positions the limit test pass/fail text and icon on the display. Accepts whole number values from 0 (bottom of display) to 100 (top of display).
DISPlay:ANNotation:LIMit:ICON [1 2] :TEXT[:STATe] <on off><sup>1</sup></on off>	NR1	Turns the limit test "PASS/FAIL" text on or off.
DISPlay:ANNotation:MARKer[1 2] :NUMBers [:STATe] <off on><sup>1</sup></off on>	NR1	Enables/disables the display of marker numbers on trace markers.
DISPlay:ANNotation:MARKer[1 2] [:STATe] <on off><sup>1</sup></on off>	NR1	Enables/disables the active marker annotation for measurement channels 1 and 2.

- 1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.
- 2. Refer to "Displaying Measurement Results" in Chapter 7 of the *User's Guide* for more information on using this command.

### Table 10-36 DISPlay (3 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DISPlay:ANNotation:MESSage:AOFF	command only	Turns off any currently showing message window — includes message window, active entry and IBASIC window.
DISPlay:ANNotation:MESSage :CLEar <sup>1</sup>	command only	Removes a user-defined pop-up message window.
DISPlay:ANNotation:MESSage :DATA <string><sup>1</sup></string>	STRING	Displays a user-defined message in the pop-up message window. Optional argument specifies the timeout: choose from NONE   SHORt   MEDium   LONG.
DISPlay:ANNotation:MESSage :STATe <on off><sup>1</sup></on off>	NR1	Enables/disables the message window — CAUTION: this suppresses display of all messages (even ERROR messages).
DISPlay:ANNotation:TITLe[1 2] :DATA <string><sup>1</sup></string>	STRING	Enters a string for the specified title line.
DISPlay:ANNotation:TITLe[:STATe] <on off><sup>1</sup></on off>	NR1	Turns on/off display of the title and clock.
DISPlay:ANNotation:YAXis:MODE <char></char>	CHAR	Sets mode for the Y-axis labels — choose RELative or ABSolute
DISPlay:ANNotation:YAXis[:STATe] <on off><sup>2</sup></on off>	NR1	Turns on/off Y-axis labels.
DISPlay:CMAP:COLor[1 2 16] :GREYscale <num></num>	NR2	Changes the default intensity of the selected item on the analyzer's internal monitor.

1. Refer to "Operator Interaction" in Chapter 7 of the *User's Guide* for more information on using this command.

2. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DISPlay:CMAP:COLor[1 2 16] :HSL <num>,<num>,<num></num></num></num>	NR2	For use with an external VGA compatible monitor. Sets hue, saturation, and luminance for the selected display item. Accepted values for each parameter are 0 to 1.
DISPlay:CMAP:COLor[1 2 16] :RGB <num,num,num></num,num,num>	NR2	For use with an external monitor. Sets the color map based on the Red/Green/Blue model. Accepted values for each parameter are 0 to 1.
DISPlay:CMAP:DEFault	command only	For use with an external monitor. Sets the color scheme to the factory default.
DISPlay:CMAP:SCHeme <char></char>	CHAR	Sets the color scheme for an external monitor. Choose from DEFault DEFault2 GREY INVers e CUSTom.
DISPlay:FORMat <char></char>	CHAR	Selects the format
		(full or split screen) for displaying trace data — choose SINGle (overlay) or ULOWer (split).
DISPlay:FORMat:EXPAND <on off></on off>	NR1	Enables/disables expand measurement mode.
DISPlay:MENU:KEY[1 2 7] <string><sup>1</sup></string>	STRING	Specifies the softkey menu labels from a remote controller or IBASIC
DISPlay:MENU[2]:KEY[1 2 7] <string> 1</string>	STRING	Specifies the softkey menu labels when using user-defined BEGIN key.
DISPlay:MENU:RECall:FAST [:STATe] <on off><sup>2</sup></on off>	NR1	Turns on/off fast recall mode.

#### Table 10-36 DISPlay (4 of 7)

- 1. Refer to "Operator Interaction" in Chapter 7 of the *User's Guide* for more information on using this command.
- 2. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

#### Table 10-36 DISPlay (5 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DISPlay:PROGram[:MODE] <char></char>	CHAR	Selects the portion of the analyzer's screen to be used as an HP Instrument BASIC display — choose from OFF   FULL   UPPer   LOWer.
DISPlay:WINDow[1 2 10] :GEOMetry:LLEFT?	query only NR1, NR1	Queries the absolute pixel coordinates of the lower left corner of the selected display window.
DISPlay:WINDow[1 2 10] :GEOMetry:SIZE?	query only NR1, NR1	Queries the width and height (in pixels) of the selected display window.
DISPlay:WINDow[1 2 10] :GEOMetry:URIGHT?	query only NR1,NR1	Queries the absolute pixel coordinates of the upper right corner of the selected display window.
DISPlay:WINDow:GRAPhics :BUFFer[:STATe] <on off><sup>1</sup></on off>	NR1	Turn on/off buffering of user graphics commands.
DISPlay:WINDow[1 2 10] :GRAPhics :CIRCle <num><sup>2</sup></num>	command only	Draws a circle of the specified Y-axis radius centered at the current pen location — num is the radius in pixels. <sup>3</sup>
DISPlay:WINDow[1 2 10] :GRAPhics:CLEar <sup>3</sup>	command only	Clears the user graphics and graphics buffer for the specified window.
DISPlay:WINDow[1 2 10] :GRAPhics:COLor <num><sup>3</sup></num>	NR1	Sets the color of the user graphics pen — choose from 0 for erase, 1 for bright, and 2 for dim.
DISPlay:WINDow[1 2 10] :GRAPhics [:DRAW] <num1>,<num2><sup>3</sup></num2></num1>	command only	Draws a line from the current pen position to the specified new pen position — num1 and num2 are the new absolute X and Y coordinates in pixels. 3

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. Refer to Chapter 7, "Using Graphics," for more information.

3. Refer to Chapter 7, and to the example program titled "GRAPHICS" in the *Example Programs Guide* for more information.

Table 10-36	DISPlay (6 of 7)
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SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DISPlay:WINDow[1 2 10] :GRAPhics:LABel <string><sup>1</sup></string>	command only	Draws a label with the lower left corner at the current pen location.
DISPlay:WINDow[1 2 10] :GRAPhics:LABel:FONT <char><sup>1</sup></char>	CHAR	Selects the user graphics label font — choose from SMAL1 HSMal1 NORMa1 HNORma1  BOLD HBOLd SLANt HSLant.
DISPlay:WINDow[1 2 10] :GRAPhics:MOVE <num1>,<num2><sup>1</sup></num2></num1>	NR1,NR1	Moves the pen to the specified new pen position — num1 and num2 are the new absolute X and Y coordinates in pixels. <sup>1</sup>
DISPlay:WINDow[1 2 10] :GRAPhics:RECTangle <numl>,<num2></num2></numl>	command only	Draws a rectangle of the specified size with lower left corner at the current pen position — num1 and num2 are the width and height in pixels. $^1$
DISPlay:WINDow[1 2 10] :GRAPhics:SCALe <xmin>,<xmax>,<ymin,<ymax></ymin,<ymax></xmax></xmin>	NR1	Specifies new coordinates for window.
DISPlay:WINDow[1 2 10] :GRAPhics :STATe?	query onlyNR1	Queries whether a window is enabled for user graphics commands.
DISPlay:WINDow[1 2]:TRACe :GRATicule:GRID[:STATe] <on of F&gt;<sup>2</sup></on of 	NR1	Turns display graticule on/off .
DISPlay:WINDow[1 2] :TRACe[1 2][:STATe] <on off><sup>2</sup></on off>	NR1	Turns the display of trace and memory data from the specified measurement channel on/off .
DISPlay:WINDow[1 2]:TRACe :Y[:SCALe]:AUTO ONCE	command only	Scales the measurement data for a best fit display.

- 1. Refer to "Using Graphics" in Chapter 7 and the "GRAPHICS" program in the *Example Programs Guide* for more information on using this command.
- 2. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

### Table 10-36 DISPlay (7 of 7)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
DISPlay:WINDow[1 2]:TRACe :Y[:SCALe]:PDIVision <num><sup>1</sup></num>	NR3	Specifies the height (dB or units per division) of each vertical division of the specified measurement channel.
DISPlay:WINDow[1 2]:TRACe :Y[:SCALe]:RLEVel <num><sup>1</sup></num>	NR3	Specifies the value for the Y-axis reference position for the specified measurement channel.
DISPlay:WINDow[1 2]:TRACe :Y[:SCALe]:RPOSition <num><sup>1</sup></num>	NR3	Specifies the Y-axis reference position for the specified measurement channel.
DISPlay:WINDow[1 2 10] :TRACe[1 2]:Y:TRACk <off peak freq></off peak freq>	CHAR	Selects the method for reference offset tracking.
DISPlay:WINDow[1 2 10] :TRACe[1 2]:Y:TRACk:FREQuency <num><sup>1</sup></num>	NR3	Selects frequency to track with reference tracking.

1. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is assumed.

#### Table 10-37FORMat

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
FORMat:BORDer <char></char>	CHAR	Specifiesa the byte order used for HPIB data transfer — choose NORMal or SWAPped (for PC-compatible systems).
FORMat[:DATA] <char>[,<num>]</num></char>	CHAR [,NR1]	Specifies the data format for use during data transfer — choose from REAL,64   REAL,32   INTeger,16   ASCii.

## Table 10-38 HCOPy (1 of 2)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
HCOPy:ABORt	command only	Aborts any hardcopy currently in progress.
HCOPy:DEVice[1 2 3]:COLor <on off><sup>1,2</sup></on off>	NR1	Selects monochrome OFF or color ON mode for hardcopy output.
HCOPy:DEVice[1 2 3]:LANGuage <char><sup>2</sup></char>	CHAR	Selects the language for hardcopy output — choose from PCL   HPGL   EPSon   IBM   PCX   PCL5 <sup>3</sup>
HCOPy:DEVice[1 2 3]:MODE <char><sup>2</sup></char>	CHAR	Selects the graph and/or table(s) to appear on a hardcopy plot — choose from GMARker   GRAPh   ISETtings   M ARKer   TABLe.
HCOPy:DEVice[1 2 3]:PAGE:MARGin :LEFT <num> <sup>2</sup></num>	NR2	Sets the left margin (for printer output) in millimeters.
HCOPy:DEVice[1 2 3]:PAGE:MARGin :TOP <num><sup>2</sup></num>	NR2	Sets the top margin (for printer output) in millimeters.
HCOPy:DEVice[1 2 3]:PAGE :ORIentation <char><sup>2</sup></char>	CHAR	Sets printer output page orientation — choose PORTrait or LANDscape.
HCOPy:DEVice[1 2 3]:PAGE:WIDTh <num><sup>2</sup></num>	NR2	Sets the print width (for printer output) in millimeters.
HCOPy:DEVice[1 2 3]:PORT <char><sup>2</sup></char>	CHAR	Selects the communications port for hardcopy output — choose from CENTronics   SERial   GPIB   MM EMory   LAN.

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. For DEVice, use 1 for PCL/Epson printers, 2 for plotters, and 3 for PCL5 printers.

3. EPSon and IBM produce the same results.

#### Table 10-38 HCOPy (2 of 2)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
HCOPy:DEVice[1 2]:RESolution <num><sup>1</sup></num>	NR1	Sets the printer resolution in dots per inch.
HCOPy[:IMMediate]	command only	Initiates a hardcopy output (print or plot).
		For DEVice, use 1 for PCL/Epson printers, or 2 for plotters.
HCOPy:ITEM[1 2 3]:ANNotation :STATe <on off><sup>1,2</sup></on off>	NR1	Turns on/off channel and frequency annotation as part of hardcopy output.
HCOPy:ITEM[1 2 3]:FFEed:STATe <on off><sup>1,2</sup></on off>	NR1	Turns on/off an automatic form feed at the completion of hardcopy output — use item 1 for printers and 2 for plotters.
HCOPy:ITEM[1 2 3]:GRATicule :STATe <on off><sup>1,2</sup></on off>	NR1	Turns on/off graticule as part of hardcopy output.
HCOPy:ITEM[1 2 3]:MARKer:STATe <on off><sup>2,3</sup></on off>	NR1	Turns on/off marker symbols as part of hardcopy output.
HCOPy:ITEM[1 2 3]:TITLe:STATe <on off><sup>2,3</sup></on off>	NR1	Turns on/off title and clock lines as part of hardcopy output.
$HCOP_{Y}: ITEM[1 2 3]: TRACe: STATe  2, 3$	NR1	Turns on/off trace data as part of hardcopy output.

1. For DEVice, use 1 for PCL/Epson printers, or 2 for plotters.

2. For DEVice, use 1 for PCL/Epson printers, 2 for plotters, and 3 for PCL5 printers.

3. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

#### Table 10-39INITiate

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
INITiate[1 2]:CONTinuous <on off><sup>1</sup></on off>	NR1	Sets the trigger system to continuously sweep or to stop sweeping.
INITiate[1 2][:IMMediate]	command only	Initiates a new measurement sweep.

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

#### Table 10-40INPut

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
INPut:GAIN:AUTo <r a b>,<on off></on off></r a b>	command only	Sets the R, A, or B IF input automatic gain control on or off.
INPut:GAIN:SETTing <r a="" b=""  ="">, <high low="" medhigh="" medium=""  =""></high></r>	command only	Sets the R, A, or B IF input gain to one of four choices: high, medium-high, medium, or low.

#### Table 10-41MMEMory (1 of 3)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
MMEMory:CATalog? <string><sup>1</sup></string>	query only STRING	Lists the names of the files in memory.
MMEMory:CDIRectory <string></string>	STRING	Changes the current directory on a DOS formatted disk — new directory must be on the same mass storage device.
<pre>MMEMory:COPY <string1>, <string2> <sup>1, 2</sup></string2></string1></pre>	command only	Copies a file — string1 is the source file, string2 is the destination file.
MMEMory:DELete <string><sup>1,2</sup></string>	command only	Deletes a file — string is the filename.
<pre>MMEMory:INITialize [<string>[,<char>[,<num>]]]</num></char></string></pre>	command only	Formats a disk — string is the mass storage device MEM: (internal memory), or INT: (internal floppy disk). Disk format char is DOS, and the interleave factor num.
MMEMory:LOAD:STATe 1, <string> <sup>1,3</sup></string>	command only	Recalls an instrument state from mass storage — string is the filename.
MMEMory:LOAD:CKIT:USER[:SELECT] {KIT1 KIT2}	command only	Recalls a user cal kit.
MMEMory:FILE:INFO? <string><sup>1</sup></string>	query only STRING	Returns file information such as date/time.
MMEMory:MDIRectory <string> <sup>2</sup></string>	command only	Makes a new directory on a DOS formatted disk.

- 1. Filenames may include the mass storage device MEM: (internal non-volatile memory), RAM: (internal volatile memory), or INT: (internal 3.5 disk drive). Wild-cards ? and \* may be used.
- 2. Be sure to catalog the desired disk using MMEM:MSIS before using this command.
- 3. Refer to "Automated Measurement Setup and Control" in Chapter 7 of the *User's Guide* for more information on using this command.

#### Table 10-41MMEMory (2 of 3)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
MMEMory:MOVE <stringl>,<string2><sup>1, 2</sup></string2></stringl>	command only	Moves or renames a file — string1 is the source (or old) filename and string2 is the destination (or new) filename.
MMEMory:MSIS <string></string>	STRING	Selects a mass storage device — choose MEM: (internal memory), or INT: (internal floppy disk drive).
MMEMory:RDIRectory <string><sup>2</sup></string>	command only	Deletes a directory from a DOS formatted disk.
<pre>MMEMory:STORe:STATe 1, <string> <sup>1,2,3</sup></string></pre>	command only	Saves an instrument state to mass storage — string is the filename.
MMEMory:STORe:STATe:CORRection	NR1	Turns the calibration on/off — part of the definition of a saved file.
MMEMory:STORe:STATe:FORMat <char></char>	CHAR	Saves instrument state files to be compatible with older "A/B" model analyzers (choose B8711), or with current "C" model analyzers (choose C8711).
MMEMory:STORe:STATe:ISTate <on off><sup>3</sup></on off>	NR1	Turns the instrument state on/off — part of the definition of a saved file.
MMEMory:STORe:STATe:TRACe <on off><sup>3</sup></on off>	NR1	Turns the data trace on/off — part of the definition of a saved file.

- 1. File names may include the mass storage device name—MEM: internal non-volatile memory, RAM: internal volatile memory, or INT: internal 3.5" disk drive. Wildcards ? and \* may be used.
- 2. Be sure to catalog the desired disk using MMEM:MSIS before using this command.
- 3. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
MMEMory:STORe:STATe:TSCAL <on off=""  =""><sup>1</sup></on>	NR1	When on, the saved state will be the test set cal only.
MMEMory:STORe:TRACe <char>,<string><sup>2,3</sup></string></char>	command only	Stores an ASCII list of trace and frequency values to a file — char is the formatted data trace CH<1 2>FDATA and string is the filename.
MMEMory:STORe:TRACe:FORMat <char></char>	CHAR	Selects the format that the ASCII data will be saved in. Choose from LOTUS 123 or TOUChstone.
<pre>MMEMory:TRANsfer:BDAT <string><sup>2</sup>[,<block>]<sup>4</sup></block></string></pre>	STRING, BLOCK	Copies a file to or from the analyzer's disk drive. <sup>5</sup>
<pre>MMEMory:TRANsfer[:HFS] <string><sup>2</sup>[,<block>]<sup>4</sup></block></string></pre>	STRING,	Copies a file to or from the analyzer's disk drive. <sup>5</sup>

#### Table 10-41MMEMory (3 of 3)

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. File names may include the mass storage device name—MEM: internal non-volatile memory, RAM: internal volatile memory, or INT: internal 3.5" disk drive. Wildcards ? and \* may be used.

- 3. Refer to "Automated Measurement and Control" in Chapter 7 of the *User's Guide* for more information on using this command
- 4. Refer to the *Example Programs Guide* for more information on using this command.
- 5. Refer to the example programs PUTFILE and GETFILE in the *Example Programs Guide*.

## Table 10-42OUTPut

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
OUTPut[:STATe] <on off><sup>1</sup></on off>	NR1	Turns RF power from the source on/off .

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

#### Table 10-43POWer

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
POWer[1 2]:MODE <char></char>	CHAR	Specifies either frequency sweep (FIXed) or power sweep (SWEep).

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
PROGram <sup>1</sup> :CATalog?	query only STRING	Lists the names of the defined IBASIC programs — response is "PROG" (if a program is present) or the null string ("").
PROGram <sup>1</sup> [:SELected] <sup>2</sup> :DEFine <block></block>	BLOCK	Downloads an IBASIC program from an external controller.
PROGram <sup>1</sup> [:SELected] <sup>2</sup> :DELete:ALL	command only	Deletes all IBASIC programs from the program buffer — equivalent to an HP BASIC SCRATCH A command.
PROGram <sup>1</sup> [:SELected] <sup>2</sup> :DELete[:SELected]	command only	Deletes the active IBASIC program — equivalent to an HP BASIC SCRATCH A command.
PROGram <sup>1</sup> [:SELected] <sup>2</sup> :EXECute <string></string>	command only	Executes an IBASIC command.
PROGram <sup>1</sup> [:SELected] <sup>2</sup> :MALLocate <num></num>	NR1	Allocates memory space for IBASIC programs — choose an integer between 2048 and 4000000 bytes.

1. IBASIC programs can be generated and controlled in the instrument.

2. Commands grouped under the SELected mnemonic in the PROGram subsystem operate on the active program buffer.

#### Table 10-44PROGram (2 of 2)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
PROGram [:SELected] <sup>1</sup> :NAME 'PROG'	STRING	Selects the IBASIC program in the program buffer to be active.
PROGram [:SELected] <sup>1</sup> :NUMBer <string>,<data><sup>2</sup></data></string>	BLOCK or NR3 <sup>2</sup>	Loads a new value for a numeric variable string in the active IBASIC program — num is the new value.
PROGram [:SELected] <sup>1</sup> :STATe <char></char>	CHAR	Selects the state of the active IBASIC program — choose from STOP   PAUSe   RUN   CONTinue.
PROGram [:SELected] <sup>1</sup> :STRing <string1>,<string2></string2></string1>	STRING	Loads a new value for a string variable string1 in the active IBASIC program — string2 is the new value.
PROGram [:SELected] <sup>1</sup> :WAIT	NR1	Waits until the IBASIC program completes.

1. Commands grouped under the SELected mnemonic in the PROGram subsystem operate on the active program buffer.

2. The parameter type of the data is determined by the format selected — FORMat REAL uses BLOCK data, FORMat ASCii uses NR3 data separated by commas.

#### **Table 10-45** ROUTe

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
ROUTE[1 2]:REFLection:PATH :DEFine:PORT<1 2  12>	NR1	Selects which port of the test set is connected to the REFLECTION port of the analyzer. <sup>1</sup>
ROUTE[1 2]:TRANsmission:PATH :DEFine: PORT <1 2  12>	NR1	Selects which port of the test set is connected to the TRANSMISSION port of the analyzer. <sup>1</sup>
ROUTe[1 2]:PATH:DEFine : PORT <num>,<num></num></num>	NR1	Selects which port of the analyzer is to function as the reflection (RF out) port and which port is to function as the transmission (RF in) port. Choose from $1, 2$ (forward), or $2, 1$ (reverse). <sup>2</sup>

For use with multiport test sets only.
 For use with the HP 8712ES/8714ES models only.

### Table 10-46 SENSe (1 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:ACTIVE?	query only	Returns true (1) if the channel is active, false (0) if the channel is not active.
SENSe[1 2]:AVERage:CLEar	command only	Re-starts the trace averaging function.
SENSe[1 2]:AVERage:COUNt <num></num>	NR1	Specifies a count or weighting factor for the averaged measurement data.
SENSe[1 2]:AVERage[:STATe] <on off><sup>1</sup></on off>	NR1	Turns the trace averaging function on/off .
SENSe[1 2]:BWIDth[:RESolution] <num> HZ</num>	NR2	Specifies the bandwidth of the IF receiver (fine, narrow, medium or wide) to be used in the measurement — choose 15 (fine) 250 (narrow) 1200 (medium narrow) 3700 (medium) 4000 (medium wide) or 6500 (wide).
SENSe[1 2]:CORRection :ANNotation?	query only	Returns the current calibration annotation: "C", "C?", "Cx", or "".
SENSe[1 2]:CORRection :CAPacitance:CONNector <num></num>	NR3	Selects a connector compensating capacitance value. (For use with structural return loss measurements on analyzers with Option 100 only.)

1. NR1 values of 1 (on) and 0 (off) can be used in place of CHAR values ON and OFF.

#### Table 10-46 SENSe (2 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
<pre>SENSe[1 2]:CORRection:CKIT:LOAD :MODify:DELay-? #0~1e+6[S]#</pre>	NR3	Sets or queries the cal kit load standard offset delay time.
SENSe[1 2]:CORRection:CKIT:LOAD :MODify:LOSS-? #0~1e+12#	NR3	Sets or queries the cal kit load standard offset loss value.
SENSe[1 2]:CORRection:CKIT:LOAD :MODify:ZOFFset-? #25~100[OHM]#	NR1	Sets or queries the cal kit load standard offset impedance value.
<pre>SENSe[1 2]:CORRection:CKIT:MODify [:SElect] {TYPenf TYPenm UD1 TYPe35mm TYPef f UD2 TYPeapc7}</pre>	CHAR	Selects or queries the cal kit connector type.
SENSe[1 2]:CORRection:CKIT:OPEN :MODify:CONE-? #-1e-60~1[FARAD]#	NR3	Sets or queries the cal kit open standard fringe capacitance C1 (f <sup>1</sup> , Farad/Hz) value.
SENSe[1 2]:CORRection:CKIT:OPEN :MODify:CTHRee-? #-1e-60~1[FARAD]#	NR3	Sets or queries the cal kit open standard fringe capacitance C3 (f <sup>3</sup> , Farad/Hz <sup>3</sup> ) value.
SENSe[1 2]:CORRection:CKIT:OPEN :MODify:CTWO-? #-1e-60~1[FARAD]#	NR3	Sets or queries the cal kit open standard fringe capacitance C2 $(f^2$ , Farad/Hz <sup>2</sup> ) value.
SENSe[1 2]:CORRection:CKIT:OPEN :MODify:CZERo-? #-1e-60~1[FARAD]#	NR3	Sets or queries the cal kit open standard fringe capacitance model C0 ( $f^0$ , Farad) value.
SENSe[1 2]:CORRection:CKIT:OPEN :MODify:DELay-? #0~1e-06[S]#	NR3	Modifies or queries the cal kit open standard offset delay time.

### Table 10-46 SENSe (3 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:CORRection:CKIT:OPEN :MODify:LOSS-? #0~1e+12#	NR3	Modifies or queries the cal kit open standard offset loss value.
SENSe[1 2]:CORRection:CKIT:OPEN :MODify:ZOFFset-? #25~100[OHM]#	NR3	Modifies or queries the cal kit open standard offset impedance value.
SENSe[1 2]:CORRection:CKIT:PRESet [:IMMediate]	Command Only	Sets all values of both user-defined cal kits to the default values.
<pre>SENSe[1 2]:CORRection:CKIT:SAVE-? {KIT1 KIT2}</pre>	CHAR	Saves the user-defined cal kit or queries whether the selected user-defined cal kit has been saved.
<pre>SENSe[1 2]:CORRection:CKIT:SHORt :MODify:DELay-? #0~1e-06[S]#</pre>	NR3	Modifies or queries the cal kit short standard offset delay time.
SENSe[1 2]:CORRection:CKIT:SHORt :MODify:LOSS-? #0~1e+12#	NR3	Modifies or queries the cal kit short standard offset loss value.
SENSe[1 2]:CORRection:CKIT:SHORt :MODify:ZOFFset-? #25~100[OHM]#	NR1	Modifies or queries the cal kit short standard offset impedance value.
<pre>SENSe[1 2]:CORRection:CKIT:THRU :MODify:DELay-? #0~1e-06[S]#</pre>	NR3	Modifies or queries the cal kit thru standard offset delay time.
SENSe[1 2]:CORRection:CKIT:THRU :MODify:LOSS-? #0~1e+12#	NR3	Modifies or queries the cal kit thru standard offset loss value.
SENSe[1 2]:CORRection:CKIT:THRU :MODify:ZOFFset-? #25~100[OHM]#	NR3	Modifies or queries the cal kit thru standard offset impedance value.

### Table 10-46 SENSe (4 of 16)

SUBSYSTEM COMMANDS		FORM	DESCRIPTION	
SENSe[1 2]: [:SELect]?	CORRection:CLASs		CHAR	Returns the current calibration choice. Returns string from the <item> list (below).</item>
SENSe[1 2]:CORRection:CLASs [:SELect] <item></item>		command only	Selects an existing calibration from the following <item> list:</item>	
	DEFault1	Defa	ult factory on	e-port calibration
	DEFault2	Defa	ult factory tw	o-port calibration
	REFLection3*	Usei	r one-port cali	bration
	TRANsmission1*	User	r response cali	bration
	TRANsmission2*	User	User response and isolation calibration	
TRANsmission3* User		r enhanced res	sponse calibration	
	TESTset1	Mul	ti-port testset	calibration
	TWOPort* calibration	Usei	r two-port cali	bration Multi-port testset
* The requested user calibration may or may not be stored in memory, and may or may not be valid for the current instrument settings. If the requested user calibration is invalid, a valid user calibration will be selected, if found. If no valid user calibration is found, the default factory calibration will be selected. The instrument can be queried with SENSe[1 2]:CORRection:CLASs[:SELect]? to determine the current calibration choice.			y not be stored in memory, and rument settings. If the d user calibration will be n is found, the default factory can be queried with ct]? to determine the current	
SENSe[1 2]: :ABORt	CORRection:COLLect		command only	Aborts the calibration that is currently in progress.

### Table 10-46 SENSe (5 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:CORRection: COLLect[:ACQuire] <char></char>	command only	Measures a calibration standard — select <char> from:</char>
		STANdard1
		STANdard2
		STANdard3
		STANdard4
		STANdard5
		STANdard6
		STANdard7
SENSe[1 2]:CORRection :COLLect:CKIT[:SELect] <st ring&gt;</st 	STRING	Selects a Cal Kit— choose from one of the following strings: 'COAX, 7MM, TYPE-N, 50, FEMALE' 'COAX, 7MM, TYPE-N, 50, MALE' 'COAX, 3.5MM, APC-3.5, 50, IMPLIED' 'USER USER1 USER2, IMPLIED, IMPLIED, IMPLIED, IMPLIED, 'COAX, 7MM, TYPE-F, 75, IMPLIED' 'COAX, 7MM, TYPE-N, 75, FEMALE' 'COAX, 7MM, TYPE-N, 75, MALE'
SENSe[1 2]:CORRection :COLLect:CKIT:PORT[1 2   12][:SELect] <string></string>	STRING	Selects which port of the analyzer or multiport test set will be assigned a Cal Kit. Also, selects a Cal Kit— choose from one of the following strings: `COAX, 7MM, TYPE-N, 50, FEMALE' `COAX, 7MM, TYPE-N, 50, MALE' `COAX, 3.5MM, APC-3.5, 50, IMPLIED' `USER  USER1  USER2, IMPLIED, IMPLIED, IMPLIED, IMPLIED, IMPLIED, IMPLIED, IMPLIED' `COAX, 7MM, TYPE-F, 75, IMPLIED' `COAX, 7MM, TYPE-N, 75, FEMALE' `COAX, 7MM, TYPE-N, 75, MALE' `COAX, 7MM, APC-7, 50, IMPLIED'

Table 10-46	SENSe (6 of 16)
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SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:CORRection:COLLect :ISTate[:AUTO] <on off><sup>1</sup></on off>	NR1	Selects the instrument state for calibration — choose Full Band (ON) or User Defined (OFF).
SENSe[1 2]:CORRection:COLLect :METHod <char></char>	command only	<ul> <li>Selects the type of calibration — choose from:</li> <li>TRAN1 — Transmission response</li> <li>TRAN2 — Transmission response &amp; Isolation</li> <li>TRAN3 — Transmission enhanced response</li> <li>REFL3 — Reflection one port</li> <li>TEST — Test Set Calibration <sup>1</sup></li> <li>VERIFY — Calibration Check</li> <li>TWOPort — Two-port</li> </ul>
SENSe[1 2]:CORRection:COLLect :MP:OPEN <stan1 stan2  stan12></stan1 stan2  stan12>	command only	calibration Measures an open on the port selected during a test set
		calibration. <sup>2</sup>
SENSe[1 2]:CORRection:COLLect :MP:SHORT <stan1 stan2  stan12></stan1 stan2  stan12>	command only	Measures a short on the port selected during a test set calibration. <sup>2</sup>
SENSe[1 2]:CORRection:COLLect :MP:LOAD <stan1 stan2  stan12></stan1 stan2  stan12>	command only	Measures a load on the port selected during a test set calibration. <sup>2</sup>
SENSe[1 2]:CORRection:COLLect :MP:THRU <stan1 stan2  stan6></stan1 stan2  stan6>	command only	Measures a thru on the port selected during a test set calibration. <sup>2</sup>

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. For use with multiport test sets only.

#### Table 10-46 SENSe (7 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:CORRection:COLLect :PORTS <2 4 6 8 10 12>	NR1	Selects the number of ports to perform a test set calibration on. <sup>1</sup>
SENSe[1 2]:CORRection:COLLect :SAVE	command only	Completes and saves current calibration.
SENSe[1 2]:CORRection:COLLect :VERify:REFLection <stan1 stan2  stan12></stan1 stan2  stan12>	command only	Measures a calibration standard during a cal check procedure for reflection measurements.
<pre>SENSe[1 2]:CORRection:COLLect :VERify:TRANsmission <stan1 stan2  stan12>;</stan1 stan2  stan12></pre>	command only	Measures a calibration standard during a cal check procedure for transmission measurements.
SENSe[1 2]:CORRection:CSET [:SELect] DEFault	command only	Restores the "factory" default calibration for the current measurement and channel.
SENSe[1 2]:CORRection:CSET [:SELect]?	query only CHAR	Queries the current calibration type — returns DEF (factory default), FULL (full band) or USER (user defined).
SENSe[1 2]:CORRection:EDELay :TIME <num><sup>2</sup></num>	NR3	Specifies the electrical delay in seconds.
SENSe[1 2]:CORRection:EXTension :REFLection[:TIME] <num> <sup>2</sup></num>	NR3	Specifies the port extension at the reflection port, in seconds.
SENSe[1 2]:CORRection:EXTension [:STATe] <on off><math>^3</math></on off>	NR1	Enables port extensions.

- 1. For use with multiport test sets only.
- 2. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is assumed.
- 3. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

#### Table 10-46 SENSe (8 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:CORRection:EXTension :TRANsmission[:TIME] <num><sup>1</sup></num>	NR3	Specifies the port extension at the transmission port, in seconds.
SENSe[1 2]:CORRection:IMPedance :INPut:MAGNitude <num><sup>1</sup></num>	NR3	Specifies the reference impedance for the Smith chart display. The default is the analyzer's system impedance.
SENSe[1 2]:CORRection:IMPedance :INPut:MAGNitude:SELect ZO_50	NR1	Selects 50 ohms as the system impedance.
SENSe[1 2]:CORRection:IMPedance :INPut:MAGNitude:SELect ZO_75	NR1	Selects 75 ohms as the system impedance.
SENSe[1 2]:CORRection:ISOLation [:STATe] {OFF 0 ON 1}	NR1	Enables or disables use of isolation error correction when 2-port calibrations are selected.
SENSe[1 2]:CORRection:LENGth :COAX <num><sup>1</sup></num>	NR2	Specifies the length of cable to be calibrated, in feet or meters. <sup>2</sup>
SENSe[1 2]:CORRection:LENGth :CONNector <num><sup>1</sup></num>	NR2	Specifies the length of an interface connector, in mm or inches. <sup>2</sup>
SENSe[1 2]:CORRection:LOSS :COAX <num><sup>1</sup></num>	NR2	Specifies the loss of a cable under test, in dB/100 ft. <sup>2</sup>
SENSe[1 2]:CORRection:MODel :CONNector[:IMMediate]	command only	Measures the cable connector and determine the optimum values for connector length and connector capacitance. <sup>2</sup>

- 1. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is used.
- 2. For use with structural return loss measurements using analyzers with Option 100 only.

#### Table 10-46 SENSe (9 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:CORRection:OFFSet :PHASe	NR3	Specifies the phase offset.
SENSe[1 2]:CORRection:ONEPort :REFLection[:IMMediate]	command only	Retrieves the user one-port reflection error correction factors from internal memory and applies them to the current measurement.
SENSe[1 2]:CORRection:ONEPort :TRANSmission[:IMMediate]	command only	Retrieves the user one-port transmission error correction factors from internal memory and applies them to the current measurement.
SENSe[1 2]:CORRection:TWOPort [:IMMediate]	command only	Retrieves the user two-port error correction factors from internal memory and applies them to the current measurement.
SENSe[1 2]:CORRection:PEAK :COAX[:STATe] <on off> <sup>1</sup></on off>	NR1	Turns multi-peak correction on or off. <sup>2</sup>
SENSe:CORRection:RVELocity :COAX <num> <sup>3</sup></num>	NR3	Specifies the velocity factor to be used when displaying the distance for electrical length and port extensions. 1.0 the speed of light.
SENSe[1 2]:CORRection:RVELocity [:IMMediate]	command only	Measures the cable and determine the optimum values for cable loss and velocity factor. <sup>2</sup>
SENSe[1 2]:CORRection:TESTSET	command only	Brings up the Test Set Cal menu. <sup>2</sup>

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

- 2. For use with fault location measurements on analyzers with Option 100 only.
- 3. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (Hz for frequency or S for time) is assumed.

#### Table 10-46 SENSe (10 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:CORRection:THReshold :COAX <num></num>	NR2	Selects multi-peak threshold value, in dB. <sup>1</sup>
SENSe[1 2]:COUPle <char></char>	CHAR	Turns the alternate sweep mode on/off — choose All (coupled sweep) or NONE (alternate sweep).
SENSe[1 2]:DETector[:FUNCtion] <char></char>	CHAR	Specifies which detection mode is used to make the measurement — choose BBANd (broadband) or NBANd (narrowband).
SENSe[1 2]:DISTance:CENTer <num></num>	NR3	Sets the center distance for a fault location measurement, in feet or meters. <sup>1</sup>
SENSe[1 2]:DISTance:STARt <num></num>	NR3	Sets the start distance for a fault location measurement, in feet or meters. <sup>1</sup>
SENSe[1 2]:DISTance:UNITs <char></char>	CHAR	Specifies distance units. Choose METers or FEET. <sup>1</sup>
SENSe[1 2]:DISTance:STOP <num></num>	NR3	Sets the stop distance for a fault location measurement, in feet or meters. <sup>1</sup>
SENSe[1 2]:FREQuency:CENTer <num> 2</num>	NR3	Sets the center frequency of the RF source.

1. For use with fault location measurements on analyzers with Option 100 only.

2. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (Hz for frequency or S for time) is assumed.

#### Table 10-46 SENSe (11 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:FREQuency:MODE <char></char>	CHAR	Sets the fault location measurement to CENTer (bandpass) or LOWPass. <sup>2</sup>
SENSe[1 2]:FREQuency:SPAN <num> 1</num>	NR3	Sets the frequency span of the RF source.
SENSe[1 2]:FREQuency:SPAN :MAXimum <num><sup>1</sup></num>	NR3	Sets the maximum frequency span of the RF source for bandpass fault location measurements. <sup>2</sup>
SENSe[1 2]:FREQuency:STARt <num>1</num>	NR3	Sets the start frequency of the RF source.
SENSe[1 2]:FREQuency:STOP <num> 1</num>	NR3	Sets the stop frequency of the RF source.
SENSe[1 2]:FREQuency:ZSTOp <num><sup>1</sup></num>	NR3	Sets the Z cutoff frequency for cable impedance calculations. <sup>2</sup>
SENSe[1 2]:FUNCtion?	query only STRING	Queries the measurement function — returns one of the 'XFR:POW . ' or 'XFR:POW:RAT' strings described later.

1. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (Hz for frequency or S for time) is assumed.

2. For use with fault location measurements on analyzers with Option 100 only.

### Table 10-46 SENSe (12 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:FUNCtion `FLOC <num>,<num>'</num></num>	command only	Specifies that the receiver will measure the ratio of the power (fault location) into the specified measurement channel. <i>For HP 8712ET/8714ET</i> <i>models</i> —choose 1,0 (Forward A/R). <i>For HP 8712ES/8714ES</i> <i>models</i> —choose 1,0 (Forward A/R), or 21, 20 (Reverse A/R). (For use with fault location measurement on analyzers with Option 100 only.)
SENSe[1 2]:FUNCtion 'XFRequency:POWer <num>'</num>	command only	Specifies that the receiver will measure the power into a specific detector on the specified measurement channel. <i>For HP 8712ET/8714ET models</i> — choose from detectors 0 (R), 1 (A), 2 (B), 11 (Ext X) or 12 (Ext Y). <i>For HP 8712ES/8714ES</i> <i>models</i> —choose from detectors 0 (Forward R), 20 (Reverse R), 1 (Forward A), 21 (Reverse A), 11 (Forward Ext X), 12 (Forward Ext Y).

## Table 10-46 SENSe (13 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:FUNCtion 'XFRequency:GDELay:RATio <num>,<num>'</num></num>	command only	Specifies that the receiver will measure the ratio of the power (group delay) into the specified measurement channel. <i>For</i> <i>HP 8712ET/8714ET models</i> —choose ratio 2,0 (B/R). <i>For HP 8712ES/8714ES</i> <i>models</i> —choose from ratios 2,0 (Forward B/R), or 22,20 (Reverse B/R).
<pre>SENSe[1 2]:FUNCtion 'XFRequency:POWer:RATio <num>,<num>'</num></num></pre>	command only	Specifies that the receiver will measure a ratio of the power into the specified measurement channel. <i>For HP 8712ET/8714ET models—</i> choose from ratios 1, 0 (A/R), 2, 0 (B/R), 12, 0 (Ext Y/R), 11, 12 (Ext X/Ext Y), or 12, 11 (Ext Y/Ext X). <i>For HP 8712ES/8714ES</i> <i>models</i> —choose from ratios 1, 0 (Forward A/R), 21, 20 (Reverse A/R), 2, 0 (Forward B/R), 22, 20 (Reverse B/R), 12, 0 (Forward Ext Y/R), 11, 12 (Forward Ext X/Ext Y), 12, 11 (Forward Ext Y/Ext X).

#### Table 10-46 SENSe (14 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:FUNCtion 'XFRequency:S <num>,<num>'</num></num>	NR1,NR1	Specifies that the receiver will measure an s-parameter into the specified measurement channel. The s-parameter choices will depend on the number of ports. For example, with a 2-port device, choose from 1,1 ( $S_{11}$ ), 1,2 ( $S_{12}$ ), 2,2 ( $S_{22}$ ), or 2,1 ( $S_{21}$ ). As another example, with a 12-port device using the HP 87075C multiport test set, some choices would include 1,8 ( $S_{18}$ ), or 12,1 ( $S_{12,1}$ ), or 7,7 ( $S_{77}$ ). This command may be used in place of: SENS[1 2]:FUNC `XFR:POW:RAT and ROUT[1 2]:PATH:DEF:PORT. If using the HP 87075C multiport test set, this command may be used in place of the two commands just listed, as well as: ROUT[1 2]:REFL:PATH:DEF:PORT and ROUT[1 2]:TRAN:PATH:DEF:PORT. <sup>1</sup>
SENSe[1 2]:FUNCtion:FAULt :CONNector [:IMMediate]	command only	Forces a connector verification measurement on the alternate channel. (For use with SRL measurements on analyzers with Option 100 only.)

1. For use with the HP 8712ES/8714ES models only.

#### Table 10-46 SENSe (15 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:FUNCtion:SRL : <num>,<num><sup>1</sup></num></num>	NR1,NR1	Specifies that the receiver will measure the ratio of the power (SRL) into the specified measurement channel <sup>2</sup> . <i>For HP 8712ET/8714ET</i> <i>models</i> chaose 1 0 (Forward A/R)
		<i>For HP 8712ES/8714ES</i> <i>models</i> —choose 1, 0 (Forward A/R), or 21, 20 (Reverse A/R).
SENSe[1 2]:FUNCtion:SRL :IMPedance <num><sup>1</sup></num>	NR2	Sets the cable impedance. <sup>2</sup>
SENSe[1 2]:FUNCtion:SRL :MODE <char></char>	CHAR	Sets the auto z function to AUTO or MANual. <sup>2</sup>
SENSe[1 2]:FUNCtion:SRL :SCAN[:IMMediate]	command only	Starts a cable scan. <sup>2</sup>
SENSe[1 2]:ROSCillator :SOURce <char></char>	CHAR	Specifies the source of the reference oscillator — select INTernal or EXTernal.
SENSe[1 2]:STATe <on off><sup>3</sup></on off>	NR1	Turns the specified channel on/off .

- 1. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (Hz for frequency or S for time) is assumed.
- 2. For use with structural return loss measurements on analyzers with Option 100 only.
- 3. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

#### Table 10-46 SENSe (16 of 16)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SENSe[1 2]:SWEep:POINts <num></num>	NR1	Sets the number of data points for the measurement — choose from 3 5 11 21 51 101 201 401  801 1601.
SENSe[1 2]:SWEep:TIME <num> 1</num>	NR3	Sets the sweep time.
SENSe[1 2]:SWEep:TIME:AUTO <on off once><sup>2</sup></on off once>	CHAR or NR1	Turns the automatic sweep time function on/off.
SENSe:SWEep:TRIGger:SOURce <char></char>	CHAR	Sets the trigger source for each point in a sweep — choose IMMediate or EXTernal (used in conjunction with TRIGger[:SEQuence]:SOURc e).
SENSe[1 2]:WINDow[:TYPE] <char></char>	CHAR	Sets the window selection for fault location measurements. Choose from RECTangular (Minimum), HAMMing (Medium), or KBESsel (Maximum). (For use with fault location measurements on analyzers with Option 100 only.)

- 1. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (Hz for frequency or S for time) is assumed.
- 2. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF  $\rm S_{21}.$

### Table 10-47SOURce

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SOURce[1 2]:POWer[:LEVel] [:IMMediate][:AMPLitude] <num><sup>1</sup></num>	NR3	Sets the RF power output from the source.
SOURce:POWer:PRESet <num></num>	NR3	Sets the power level that the analyzer will always return to after an instrument preset.
SOURce[1 2]:POWer:RANGe <char></char>	CHAR	Specifies the power sweep range. Choose from ATTen0  ATTen10 ATTen20 ATTen30  ATTen40  ATTen50 ATTen60.
SOURce[1 2]:POWer:STARt <num></num>	NR3	Sets the power sweep start power.
SOURce[1 2]:POWer:STOP <num></num>	NR3	Sets the power sweep stop power.

1. Numeric parameters may include an appropriate suffix; if no suffix is included, the default (HZ for frequency or S for time) is assumed.

#### Table 10-48 STATus (1 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
STATus:DEVice:CONDition?	query only NR1	Reads and clears the Device Status condition register. <sup>1</sup>
STATus:DEVice:ENABle <num></num>	NR1	Sets and queries bits in the Device Status enable register. <sup>2</sup>
STATus:DEVice[:EVENt]?	query only NR1	Reads and clears the Device Status event register. <sup>1</sup>
STATus:DEVice:NTRansition <num></num>	NR1	Sets and queries bits in the Device Status negative transition register. <sup>2</sup>
STATus:DEVice:PTRansition <num></num>	NR1	Sets and queries bits in the Device Status positive transition register. <sup>2</sup>
STATus:OPERation:AVERaging :CONDition?	query only NR1	Reads the Averaging status condition register. <sup>1</sup>
STATus:OPERation:AVERaging:ENABle <num></num>	NR1	Sets and queries bits in the Averaging status enable register. <sup>2</sup>
STATus:OPERation:AVERaging [:EVENt]?	query only NR1	Reads and clears the Averaging status event register. <sup>1</sup>
STATus:OPERation:AVERaging :NTRansition <num></num>	NR1	Sets and queries bits in the Averaging status negative transition register. <sup>2</sup>

- 1. Returns the sum of the decimal weights (2<sup>n</sup> where n is the bit number) of all bits currently set. For more information on using the status registers, refer to Chapter 5, "Using Status Registers."
- 2. <num> is the sum of the decimal weights of all bits to be set.

#### Table 10-48 STATus (2 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
STATus:OPERation:AVERaging :PTRansition <num></num>	NR1	Sets and queries bits in the Averaging status positive transition register. <sup>1</sup>
STATus:OPERation:CONDition?	query only NR1	Reads the Operational status condition register. <sup>2</sup>
STATus:OPERation:ENABle <num></num>	NR1	Sets and queries bits in the Operational status enable register. <sup>1</sup>
STATus:OPERation[:EVENt]?	query only NR1	Reads and clears the Operational status event register. <sup>2</sup>
STATus:OPERation:MEASuring :CONDition?	query only NR1	Reads the Measuring status condition register. <sup>2</sup>
STATus:OPERation:MEASuring :ENABle <num></num>	NR1	Sets and queries bits in the Measuring status enable register. <sup>1</sup>
STATus:OPERation:MEASuring [:EVENt]?	query only NR1	Reads and clears the Measuring status event register. <sup>2</sup>
STATus:OPERation:MEASuring :NTRansition <num></num>	NR1	Sets and queries bits in the Measuring status negative transition register. <sup>1</sup>
STATus:OPERation:MEASuring :PTRansition <num></num>	NR1	Sets and queries bits in the Measuring status positive transition register. <sup>1</sup>

1. <num> is the sum of the decimal weights of all bits to be set.

2. Returns the sum of the decimal weights (2<sup>n</sup> where n is the bit number) of all bits currently set. For more information on using the status registers refer to Chapter 5, "Using Status Registers."

#### Table 10-48 STATus (3 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
STATus:OPERation:NTRansition <num></num>	NR1	Sets and queries bits in the Operational Status negative transition register. <sup>1</sup>
STATus:OPERation:PTRansition <num></num>	NR1	Sets and queries bits in the Operational Status positive transition register. <sup>1</sup>
STATus:PRESet	command only	Sets bits in most enable and transition registers to their default state.
STATus:QUEStionable:CONDition?	query only NR1	Reads and clears the Questionable Status condition register. <sup>2</sup>
STATus:QUEStionable:ENABle <num></num>	NR1	Sets and queries bits in the Questionable Status enable register. <sup>1</sup>
STATus:QUEStionable[:EVENt]?	query only NR1	Reads and clears the Questionable Status event register. <sup>2</sup>
STATus:QUEStionable:LIMit :CONDition?	query only NR1	Reads and clears the Limit Fail condition register. <sup>2</sup>

1. <num> is the sum of the decimal weights of all bits to be set.

2. Returns the sum of the decimal weights (2<sup>n</sup> where n is the bit number) of all bits currently set. For more information on using the status registers refer to Chapter 5, "Using Status Registers."

#### Table 10-48 STATus (4 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
STATus:QUEStionable:LIMit:ENABle <num></num>	NR1	Sets and queries bits in the Limit Fail enable register. <sup>1</sup>
STATus:QUEStionable:LIMit [:EVENt]?	query only NR1	Reads and clears the Limit Fail event register. <sup>2</sup>
STATus:QUEStionable:LIMit :NTRansition <num></num>	NR1	Sets and queries bits in the Limit Fail negative transition register. <sup>1</sup>
STATus:QUEStionable:LIMit :PTRansition <num></num>	NR1	Sets and queries bits in the Limit Fail positive transition register. <sup>1</sup>
STATus:QUEStionable:NTRansition <num></num>	NR1	Sets and queries bits in the Questionable Status negative transition register. <sup>1</sup>
STATus:QUEStionable:PTRansition <num></num>	NR1	Sets and queries bits in the Questionable Status positive transition register. <sup>1</sup>

1. <num> is the sum of the decimal weights of all bits to be set.

2. Returns the sum of the decimal weights (2<sup>n</sup> where n is the bit number) of all bits currently set. For more information on using the status registers refer to Chapter 5, "Using Status Registers."

Table 10-49	SYSTem (1 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SYSTem:BEEPer[:IMMediate] [ <freq>[,<dur>[,<vol>]<sup>1</sup></vol></dur></freq>	NR3, NR3, NR3	Instructs the analyzer to beep. Arguments are frequency (Hz), duration (seconds), and volume (0 to 1).
SYSTem:BEEPer:VOLume <num></num>	NR2	Sets the volume of the beeper — num is a number between 0 for 0% and 1 for 100%.
SYSTem:COMMunicate:GPIB :CONTroller[:STATe] <on off><sup>2</sup>,3</on off>	NR1	Makes the analyzer the system controller.
SYSTem:COMMunicate:GPIB:ECHO <on off><sup>2</sup></on off>	NR1	Turns HP-IB mnemonic echo on/off .
SYSTem:COMMunicate:GPIB:HCOPy :ADDRess <num></num>	NR1	Sets the address of an HP-IB printer or plotter for hardcopy output — num must be an integer between 0 and 30.
SYSTem:COMMunicate:GPIB[:SELF] :ADDRess <num><sup>4</sup></num>	NR1	Sets the analyzer's HP-IB address — num must be an integer between 0 and 30.
SYSTem:COMMunicate:LAN:EADDress?	query only	Queries the analyzer's ethernet address.
SYSTem:COMMunicate:LAN:IPADdress <string></string>	STRING	Sets the analyzer's Internet Protocol address.
SYSTem:COMMunicate:LAN:PRINter :HOSTname <string></string>	STRING	Specifies the IP address of the LAN printer.

- 1. <freq>, <dur>, and <vol> are optional <num> parameters.
- 2. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.
- 3. For use with IBASIC this command cannot be executed from an external controller.
- 4. A delay of 5 seconds is required before a command is sent to the new address.

### Table 10-49 SYSTem (2 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SYSTem:COMMunicate:LAN:ROUTe :GATeway <string></string>	STRING	Sets the IP address for a LAN gateway.
SYSTem:COMMunicate:LAN:ROUTe :SMASk <string></string>	STRING	Sets the subnet mask.
SYSTem:COMMunicate:LAN:STATe <on off><sup>2</sup></on off>	STRING	Turns networking on or off.
SYSTem:COMMunicate:SERial :TRANsmit:BAUD <num></num>	NR1	Sets the baud rate for hardcopy output to a device on the serial port — choose from 1200 2400 4800 9600 19200.
SYSTem:COMMunicate:SERial :TRANsmit:HANDshake <char></char>	CHAR	Sets the handshake for communication to a hardcopy device on the serial port — choose XON or DTR.
SYSTem:COMMunicate:TTL:USER: FEED <char></char>	CHAR	Selects the function of the USER TTL IN/OUT port on the rear panel of the analyzer. Choose from DEFault   KEY   SWEep.
SYSTem:DATE <numl>,<num2>,<num3></num3></num2></numl>	NR1, NR1, NR1	Sets the year (num1), month (num2) and day (num3) of the real time clock.
SYSTem:ERRor? <sup>1</sup>	query only NR1, STRING	Queries the error queue — returns the error number and message.
SYSTem:KEY <char></char>	command only	Sends key names <sup>2</sup> which execute the same functions as front panel keys.

1. For more information on errors, refer to Chapter 13, "SCPI Error Messages."

2. A list analyzer front panel key codes is provided in Chapter 8, "Front Panel Keycodes."

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SYSTem:KEY:MASK?	query only NR1	Queries the mask (shift, ctrl, alt) associated with a keypress on an external keyboard.
SYSTem:KEY:QUEue:CLEar	command only	Clears the key queue.
SYSTem:KEY:QUEue:COUNt?	query only NR1	Queries the number of key codes in the queue.
SYSTem:KEY:QUEue:MAXimum?	query only NR1	Queries the size of the key queue (the maximum number of key codes it can hold).
SYSTem:KEY:QUEue[:STATe] <on off><sup>1</sup></on off>	NR1	Turns on/off the key queue.
SYSTem:KEY:TYPE?	query only CHAR	Queries the type of key that was pressed — returns NONE, RPG, KEY (front panel key) or ASC (external keyboard).
SYSTem:KEY:USER	command only	Sets the User Request bit of the Standard Event Status Register.
SYSTem:KEY[:VALue]?	query only NR1	Queries the key code value for the last key pressed — RPG type returns the knob count, positive for clockwise rotation, KEY type returns the front panel keycode, <sup>2</sup> and ASC type returns the ASCII code number.

#### Table 10-49 SYSTem (3 of 4)

1. Binary parameters accept the values of 1 (on) and 0 (off) in addition to ON and OFF.

2. A list of the analyzer's front panel keycodes and key names is provided in Chapter 8, "Front Panel Keycodes."

### Table 10-49 SYSTem (4 of 4)

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
SYSTem:PRESet	command only	Performs a system preset — this is the same as the front panel (PRESET) key.
SYSTem:SET <block></block>	command only	Sends a learn string (obtained using *LRN?) to the analyzer — this command is included in the learn string.
SYSTem:SET:LRN? [ <user>]<sup>1</sup></user>	BLOCK	Queries or set the instrument state.
SYSTem:SET:LRNLong? [ <user>]<sup>1</sup></user>	BLOCK	Queries or set the instrument state, data, and calibration. Similar to save/recall.
SYSTem:TIME <num1>,<num2>,<num3></num3></num2></num1>	NR1, NR1, NR1	Sets the hour (num1), minute (num2) and second (num3) of the real time clock.
SYSTem:VERSion?	query only NR2	Queries the SCPI version of the analyzer. See *IDN? to query the firmware revision.

1. Refer to "Automated Measurement Setup and Control" in Chapter 7 of the *User's Guide* for more information on using this command.

Table	10-50	TEST
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SUBSYSTEM COMMANDS	FORM	DESCRIPTION
TEST:RESult?	query only CHAR	Queries the result of the selected adjustment or self-test — the response will be NULL   PASS   FAIL.
TEST:SELect <num></num>	NR1	Selects the adjustment or self-test to execute.
TEST:STATe <char></char>	CHAR	Selects the state of the active adjustment or self-test — choose from RUN   CONTinue   STOP for the command. Query returns NULL   RUN   PAUS   DONE.
TEST:VALue <num></num>	NR1	Sets or queries a value for an adjustment or self-test.

## Table 10-51 TRACe (1 of 2)

SUBSYSTEM COMMANDS	FORM		DESCRIP	TION		
TRACe[:DATA]? <char></char>	query only	Qu foll	eries trace data — c owing array types:	choose from the		
	BLOCK or NR3 <sup>1</sup>	CH<1   2>FDATA CH<1   2>FMEM CH<1   2>SDATA CH<1   2>SMEM	<1   2>FDATA <1   2>FMEM <1   2>SDATA <1   2>SMEM	Formatted data Formatted memory data Unformatted data Unformatted memory data		
		CH• CH•	<1 2> <a b r>FWD &lt;1 2&gt;SCORR<x></x></a b r>	Raw data Two-port error correction terms. Choose X from the list below:		
Array choices for two-port error correction						
1 Forward directivity		7 8	Reverse directivity Reverse source ma	tching		
2 Forward source matchi	ng	9	Reverse reflection	tracking		
3 Forward reflection mat	ching	10	Reverse load match	hing		
4 Forward transmission t	tracking	12	Reverse isolation			
5 Forward load matching	Ş					
6 Forward isolation						

1. The parameter type of the data is determined by the format selected — FORMat REAL uses BLOCK data, FORMat ASCii uses NR3 data separated by commas.

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
TRACe[:DATA] <char>,<data></data></char>	command only	Inputs trace data — choose from the above list of arrays. The data can be either BLOCK or NR3 type. <sup>1</sup> <b>Note:</b> See Chapter 6 for more information.
TRACe[:DATA] <char1>,<char2></char2></char1>	command only	Moves data from one internal array to another — char1 is the target array (CH<1   2>SMEM) while char2 is the source array (CH<1   2>SDATA). Note that the source and target arrays must be from the same measurement channel.
TRACe:CORRection:SIMulate [:DATA] {STD1 STD2  STD12}	command only	Reads simulated calibration standards. Loads pre-computed or stored measurements of calibration standards from a remote controller into the analyzer.
TRACe:CORRection:SIMulate SAVE {TRAN1 TRAN2 TRAN3 REFL3 TWOPORT}	command only	Computes cal error correction arrays.

#### Table 10-51 TRACe (2 of 2)

1. The parameter type of the data is determined by the format selected — FORMat REAL uses BLOCK data, FORMat ASCii uses NR3 data separated by commas.

#### Table 10-52TRIGger

SUBSYSTEM COMMANDS	FORM	DESCRIPTION
TRIGger[:SEQuence]:SOURce <char></char>	CHAR	Sets the source for the sweep trigger signal — choose IMMediate or EXTernal (used in conjunction with SENSe:SWEep:TRIGger:SOURce).