Key Select Codes Arranged by Front-Panel Hardkey

The HP-IB mnemonics in the following table are functionally arranged by their front-panel key equivalent. For example, all of the mnemonics that correspond to softkeys accessed by means of the [Cal] key, will be listed under the [Cal] key in the following table.

Keys
AVG
CAL-Error correction, calibration
CAL-Calibration kits
CAL-Power Meter Calibration
CHANNEL
COPY
DISPLAY
ENTRY
FORMAT
LOCAL
MEAS
MENU (stimulus)
MARKER
MARKER FCTN
SAVE/RECALL-Internal registers
SAVE/RECALL-Disk files
SCALE REF
SEQ-Sequencing
STIMULUS
SYSTEM
SYSTEM-Limit testing
SYSTEM-Transform

Column headings:

Function	The front-panel function affected by the mnemonic.
Action	The effects of the mnemonic on that function.
Mnemonic	The HP-IB mnemonic.
S	Syntax type. See "Syntax Types," earlier in this chapter.
?	Interrogate response. If a response is defined, it is listed.
O	OPC-compatible command.
Range	The range of acceptable inputs and corresponding units.

Symbol conventions:

[ ]	Optional data.
D	Numerical data.
I	An integer appendage that is part of the command. For example, CLEA<I>, where I = 1 to 5, indicates that the actual commands are CLEA1, CLEA2, CLEA3, CLEA4, and CLEA5.
$	A character string operand which must be enclosed by double quotes.
< >	A necessary appendage.
|	An either/or choice in appendages.

Table 1-9. Key Select Codes

Function	Action	Mnemonic	S	?	O	Range
AVG						
Averaging	Restart	AVERREST	1			
	Factor	AVERFACT[D]	3	D		0 to 999
	On/off	AVERO<ON|OFF>	2	1,0		
Smoothing	Set aperture	SMOOAPER[D]	3	D		0.05 to 20%
	On/off	SMOOO<ON|OFF>	2	1,0		
IF bandwidth	Set bandwidth	IFBW[D]	3	D		10, 30, 100, 300, 1000, 3000, 3700 Hz
CAL-error correction, calibration						
Correction	On/off	CORR<ON|OFF>	2	1,0		
Interpolative correction	On/off	CORI<ON|OFF>	2	1,0		
Resume Cal sequence	Resume a previously started calibration	RESC	1			
Receiver calibration	Take receiver calibration sweep	REIC[D]	3			stimulus power range
Port extensions	Port 1	PORT1[D]	3	D		±10 s
	Port 2	PORT2[D]	3	D		±10 s
	Input A	PORTA[D]	3	D		±10 s
	Input B	PORTB[D]	3	D		±10 s
	Off	PORE<ON|OFF>	2	1,0		
Velocity factor	Set value	VELOFACT[D]	3	D		0 to 10
Z_0	Set Value	SETZ[D]	3	D		0.1 to 500Ω
Adapter removal	Recall Cal Port1	CALSPORT1	1			
	Recall Cal Port2	CALSPORT2	1			
	Adapter delay	ADAP1[D]	3	D		±10 s
	Adapter: coax	ADPTCOAX	1			
	Adapter: waveguide	ADPTWAVE	1			
	Remove adapter	MODS	1			
Test set switching	Continuous/full 2-port cal (continuously measures all 4 S-parameters)	CSWION	2	1,0		
		TSSWION				
	Hold 2-port cal (initially measures all 4 S-parameters, then only 2 parameters)	CSWIOFF	2	1,0		
		TSSWIOFF				
	Number of sweeps 2-port cal	TSSWI[D]	3	D		

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
CAL-error correction, calibration (continued)						
Sweep modes	Alternate A and B	ALTAB	1			
	Chop A and B	CHOPAB	1			
Calibrate menu	None	CALN	1	0,1		
	Response	CALIRESP	1	0,1		
	Response and Isol	CALIRAI	1	0,1		
	S11 1-port	CALIS111	1	0,1		
	S22 1-port	CALIS221	1	0,1		
	Full 2-port	CALIFUL2	1	0,1		
	One path 2-port	CALIONE2	1	0,1		
	TRL/LRM 2-port	CALITRL2	1	0,1		
Intermediate cal steps, 1 path/2-port	Isolation	ISOOP	1			
	Reflection	REFOP	1			
	Transmission	TRAOP	1			
Intermediate cal steps, full 2-port cal	Transmission	TRAN	1			
	Reflection	REFL	1			
	Isolation	ISOL	1			
Intermediate cal steps, TRL/LRM	Transmission	TRLT	1			
	S_{11} Reflection	TRLR1	1			
	S_{22} Reflection	TRLR2	1			
	Line/match 1	TRLL1	1			
	Line/match 2	TRLL2	1			
Select response & isol. class	Response	RAIRESP	1			
	Isolation	RAIISOL	1			
Select reflection class	S11A (forward open)	CLASS11A	1		OPC††	
	S11B (forward short)	CLASS11B	1		OPC††	
	S11C (forward load)	CLASS11C	1		OPC††	
	S22A (reverse open)	CLASS22A	1		OPC††	
	S22B (reverse short)	CLASS22B	1		OPC††	
	S22C (reverse load)	CLASS22C	1		OPC††	
Select transmission class	Fwd transmission	FWDT	1		OPC††	
	Rev transmission	REVT	1		OPC††	
	Fwd match	FWDM	1		OPC††	
	Rev match	REVM	1		OPC††	
Select isolation class	Forward isolation	FWDI	1		OPC††	
	Reverse isolation	REVI	1		OPC††	
	Omit isolation	OMII	1			

†† The class commands are OPC-compatible if there is only one standard in the class. If there is just one standard, that standard is measured automatically. If there is more than one standard in the class, the class command only calls another menu.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
CAL-error correction, calibration (continued)						
Select standard in class	Standard A	STANA	1		OPC	
	Standard B	STANB	1		OPC	
	Standard C	STANC	1		OPC	
	Standard D	STAND	1		OPC	
	Standard E	STANE	1		OPC	
	Standard F	STANF	1		OPC	
	Standard G	STANG	1		OPC	
Sliding load	Set	SLIS	1		OPC	
	Done	SLID	1			
Offset load	Load no offset	LOAN	1			
	Load offset	LOAO	1			
Done with:	Class	DONE	1			
	Isolation	ISOD	1		OPC	
	Reflection	REFD	1		OPC	
	Transmission	TRAD	1		OPC	
	Offset load	OFLD	1			
Save cal	Response	RESPDONE	1		OPC	
	Resp and isol	RAID	1		OPC	
	1-port cal	SAV1	1		OPC	
	2-port cal	SAV2	1		OPC	
	TRL/LRM	SAVT	1		OPC	
CAL-calibration kits						
Select default kits	7-mm	CALK7MM	1	1,0		
	3.5-mmC	CALK35MC*	1	1,0		
	3.5-mmD	CALK35MD	1	1,0		
	Type N, 50 ohm	CALKN50	1	1,0		
	Type N, 75 ohm	CALKN75	1	1,0		
	2.4-mm	CALK24MM	1	1,0		
	2.92-mm	CALK292MM	1	1,0		
	2.92*	CALK292S	1	1,0		
	User-defined	CALKUSED	1	1,0		
	TRL 3.5-mm	CALKTRLK	1	1,0		
Modify kit	Modify current	MODI1	1			
Define std. number (begin std. definition)		DEFS[D]	3			1 to 8

*CALK35MM selects the HP 85033C cal kit for the HP 8752C/53D.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
CAL-calibration kits (continued)						
Define std. type	Open	STDTOPEN	1	1,0		
	Short	STDTSHOR	1	1,0		
	Load	STDTLOAD	1	1,0		
	Delay/thru	STDTDELA	1	1,0		
	Arbitrary imped.	STDTARBI	1	1,0		
Define std. parameters	Open cap. C0	C0[D]	3			±10k (10^{-15} F)
	Open cap. C1	C1[D]	3			±10k (10^{-27} F/Hz)
	Open cap. C2	C2[D]	3			±10k (10^{-36} F/Hz^2)
	Open cap. C3	C3[D]	3			±10k (10^{-45} F/Hz^3)
	Fixed load	FIXE	1			
	Sliding load	SLIL	1			
	Offset load	OFLS	1			
	Terminal imped.	TERI[D]	3			0 to 1 kΩ
Define std. offsets	Delay	OFSD[D]	3			±1 s
	Loss	OFSL[D]	3			0 to 1000 TΩ/s
	Z0	OFSZ[D]	3			0.1 to 500Ω
	Min. frequency	MINF[D]	3			0 to 1000 GHz
	Max. frequency	MAXF[D]	3			0 to 1000 GHz
	Coaxial	COAX	1	0,1		
	Waveguide	WAVE	1	0,1		
Std. done	Standard defined	STDD	1			
Label std		LABS[$]	3			10 char.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
CAL-calibration kits (continued)						
Specify class	Response	SPECRESP[I,I..]	3			Std numbers
	Resp & Isol	SPECRESI[I,I..]	3			Std numbers
	S11A (forward open)	SPECS11A[I,I..]	3			Std numbers
	S11B (forward short)	SPECS11B[I,I..]	3			Std numbers
	S11C (forward load)	SPECS11C[I,I..]	3			Std numbers
	S22A (reverse open)	SPECS22A[I,I..]	3			Std numbers
	S22B (reverse short)	SPECS22B[I,I..]	3			Std numbers
	S22C (reverse load)	SPECS22C[I,I..]	3			Std numbers
	Forward Trans	SPECFWDT[I,I..]	3			Std numbers
	Forward Match	SPECFWDM[I,I..]	3			Std numbers
	Reverse Trans	SPECREVT[I,I..]	3			Std numbers
	Reverse Match	SPECREVM[I,I..]	3			Std numbers
	TRL Thru	SPECTRLT[I,I..]	3			Std numbers
	TRL Reflect	SPECTRLR[I,I..]	3			Std numbers
	TRL Line or Match	SPECTRLL[I,I..]	3			Std numbers
	TRL,Reflect,Forward,Match	SPECTRFM[I,I..]*	3			Std numbers
	TRL,Reflect,Reverse,Match	SPECTRRM[I,I..]*	3			Std numbers
	TRL,Line ,Forward,Match	SPECTLFM[I,I..]*	3			Std numbers
	TRL,Line ,Forward,Trans	SPECTLFT[I,I..]*	3			Std numbers
	TRL,Line ,Reverse,Match	SPECTLRM[I,I..]*	3			Std numbers
	TRL,Line ,Reverse,Trans	SPECTLRT[I,I..]*	3			Std numbers
	TRL,Thru ,Forward,Match	SPECTTFM[I,I..]*	3			Std numbers
	TRL,Thru ,Forward,Trans	SPECTTFT[I,I..]*	3			Std numbers
	TRL,Thru ,Reverse,Match	SPECTTRM[I,I..]*	3			Std numbers
	TRL,Thru ,Reverse,Trans	SPECTTRT[I,I..]*	3			Std numbers

*These commands are accepted for compatibility with the HP 8753D revision 5.00 through 5.48.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
CAL-calibration kits (continued)						
Class done		CLAD	1			
Label class	Response	LABERESP[$]	3			10 char.
	Resp. & isolation	LABERESI[$]	3			10 char.
	S11A	LABES11A[$]	3			10 char.
	S11B	LABES11B[$]	3			10 char.
	S11C	LABES11C[$]	3			10 char.
	S22A	LABES22A[$]	3			10 char.
	S22B	LABES22B[$]	3			10 char.
	S22C	LABES22C[$]	3			10 char.
	Forward Trans	LABEFWDT[$]	3			10 char.
	Forward Match	LABEFWDM[$]	3			10 char.
	Reverse Trans	LABEREVT[$]	3			10 char.
	Reverse Match	LABEREVM[$]	3			10 char.
	TRL Thru	LABETRLT[$]	3			10 char.
	TRL Reflect	LABETRLR[$]	3			10 char.
	TRL Line or Match	LABETRLL[$]	3			10 char.
	TRL, Reflect, Forward, Match	LABETRFM[$]*	3			10 char.
	TRL, Reflect, Reverse, Match	LABETRRM[$]*	3			10 char.
	TRL, Line, Forward, Match	LABETLFM[$]*	3			10 char.
	TRL, Line, Forward, Trans	LABETLFT[$]*	3			10 char.
	TRL, Line, Reverse, Match	LABETLRM[$]*	3			10 char.
	TRL, Line, Reverse, Trans	LABETLRT[$]*	3			10 char.
	TRL, Thru, Forward, Match	LABETTFM[$]*	3			10 char.
	TRL, Thru, Forward, Trans	LABETTFT[$]*	3			10 char.
	TRL, Thru, Reverse, Match	LABETTRM[$]*	3			10 char.
	TRL, Thru, Reverse, Trans	LABETTRT[$]*	3			10 char.
Label kit		LABK[$]	3			10 char.
Kit done		KITD	1			
Save kit	Into user kit	SAVEUSEK	1			
TRL/LRM Option	Cal ZO: Line ZO	CALZLINE	1	0,1		
	Cal ZO: System ZO	CALZSYST[D]	1	0,1		
	SET REF: Thru	SETRTHRU	1	0,1		
	SET REF: Reflect	SETRREFL	1	0,1		

*These commands are accepted for compatibility with the HP 8753D revision 5.00 through 5.48.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
CAL-power meter calibration						
Power meter cal	Off	PWMCOFF[D]	3	D		Cal power: −100 to 100 dB
	Each sweep	PWMCEACS[D]	3	D		Cal power: −100 to 100 dB
	One sweep	PWMCONES[D]	3	D		Cal power: −100 to 100 dB
	Take cal sweep§	TAKCS	1			
	Number of readings	NUMR[D]	3	D		1 to 100
	Set port cal pwr	PWRMCAL	1	D		−100 to 100 dB
Edit power loss table	On/off	PWRLOSS<ON|OFF>	2	1,0		
	Edit list	POWLLIST	1			
	Use sensor A or B	USES<ENSA|ENSB>	2			Sensor B available with HP 438A only
	Add segment	SADD	1			
	Edit segment N	SEDI[D]	3	D		1 to 12
	Done with segment	SDON	1			
	Delete segment	SDEL	1			
	Done	EDITDONE	1			
	Clear list	CLEL	1			
Edit power loss segment	Frequency	POWLFREQ[D]	3	D		Stimulus range†
	Value	POWLLOSS[D]	3	D		−9900 to 9900 dB
Edit cal sensor table	Edit sensor menu A	CALFSENA	1			
	Edit sensor menu B	CALFSENB	1			HP 438A only
	Add segment	SADD	1			
	Edit segment N	SEDI[D]	3	D		1 to 12
	Done with segment	SDON	1			
	Delete segment	SDEL	1			
	Done	EDITDONE	1			
	Clear list	CLEL	1			
Edit cal sensor segment	Frequency	CALFFREQ[D]	3	D		Stimulus range†
	Cal factor	CALFCALF[D]	3	D		0 to 200%
CHANNEL						
Channel	CH 1 active	CHAN1	1		OPC	
	CH 2 active	CHAN2	1		OPC	

† For frequency or power sweeps, refer to Chapter 12, "Preset State and Memory Allocation," in the *HP 8753D User's Guide.*

§ Requires pass control mode when using the HP-IB port.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
		COPY				
Copy display	To printer§	PRINALL	1			
	To plotter§	PLOT	1			
Printer	Auto feed	PRNTRAUTF<ON|OFF>	2	1,0		
Printer	Form feed	PRNTRFORF	1			
Printer setup	Default	DEFLPRINT	1			
Plotter	Auto feed	PLTTRAUTF<ON|OFF>	2	1,0		
Plotter	Form feed	PLTTRFORF	1			
Plotter setup	Default	DFLT	1			
List values		LISV	1			
Operating parameters		OPEP	1			
Next page		NEXP	1			
Previous page		PREP	1			
Print List Values or Operating parameters	Raster display dump to HP-IB§	PRINTALL	1			
Restore display		RESD	1			
Select print color	Monochrome	PRIS	1			
	Color	PRIC	1			

§ Requires pass control mode when using the HP-IB port.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
COPY (continued)						
Print feature color	Data channel 1	PCOLDATA1<color>	2			Colors‡
	Data channel 2	PCOLDATA2<color>	2			Colors‡
	Memory channel 1	PCOLMEMO1<color>	2			Colors‡
	Memory channel 2	PCOLMEMO2<color>	2			Colors‡
	Graticule	PCOLGRAT<color>	2			Colors‡
	Text	PCOLTEXT<color>	2			Colors‡
	Warning	PCOLWARN<color>	2			Colors‡
Features to be plotted	Data	PDATA<ON|OFF>	2	1,0		
	Memory	PMEM<ON|OFF>	2	1,0		
	Graticule	PGRAT<ON|OFF>	2	1,0		
	Text	PTEXT<ON|OFF>	2	1,0		
	Marker	PMKR<ON|OFF>	2	1,0		
Quadrant	Left lower	LEFL	1	0,1		
	Left upper	LEFU	1	0,1		
	Right lower	RIGL	1	0,1		
	Right upper	RIGU	1	0,1		
	Full page	FULP	1	0,1		
Pen number	Data	PENNDATA[D]	3			0,1,2 ... 10
	Memory	PENNMEMO[D]	3			0,1,2 ... 10
	Graticule	PENNGRAT[D]	3			0,1,2 ... 10
	Text	PENNTEXT[D]	3			0,1,2 ... 10
	Marker	PENNMARK[D]	3			0,1,2 ... 10
Line type	Data	LINTDATA[D]	3			0,1,2 ... 10
	Memory	LINTMEMO[D]	3			0,1,2 ... 10
Plot scale	Full page	SCAPFULL	1			
	Graticule to p1,p2	SCAPGRAT	1			
Plot speed	Slow	PLOSSLOW	1			
	Fast	PLOSFAST	1			

‡ Colors = white|cyan|magenta|blue|yellow|green|red|black

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
DISPLAY						
Channels	Dual on/off	DUAC<ON|OFF>	2	1,0		
	Split on/off	SPLD<ON|OFF>	2	1,0		
	D2/D1 to D2 (Channel 2 data divided by channel 1 data, and displayed on channel 2)	D1DIVD2<ON|OFF>	2	1,0		
Display	Data	DISPDATA	1	0,1		
	Memory only	DISPMEMO	1	0,1		
	Data and mem	DISPDATM	1	0,1		
	Data/mem	DISPDDM	1	0,1		
		DIVI				
	Data – mem	DISPDMM	1	0,1		
		MINU				
	Data to mem	DATI	1	0,1	OPC	
	Intensity	INTE[D]	3	D		50 to 100
	Blank Display	BLAD<ON|OFF>	2	1,0		
	Title	TITL[$]	4	$		48 char.
Beeper	On done	BEEPDONE<ON|OFF>	2	1,0		
	On warning message	BEEPWARN<ON|OFF>	2	1,0		
Frequency notation	Blank	FREO	1			
Adjust display	Background intensity	BACI[D]	3	D		0 to 100
	Save colors	SVCO	1			
	Recall colors	RECO	1			
	Default colors	DEFC	1			
Modify specific display feature colors	Ch 1 data/lim ln	COLOCH1D	1			
	Ch 1 memory	COLOCH1M	1			
	Ch 2 data/lim ln	COLOCH2D	1			
	Ch 2 memory	COLOCH2M	1			
	Graticule	COLOGRAT	1			
	Text	COLOTEXT	1			
	Warning	COLOWARN	1			
Adjust specific display feature color	Brightness	CBRI[D]	3	D		0 to 100
	Color	COLOR[D]	3	D		0 to 100
	Tint	TINT[D]	3	D		0 to 100
	Reset color to default	RSCO	1			

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
ENTRY						
Step keys	Up	UP	1			
	Down	DOWN	1			
Entry off		ENTO	1			
FORMAT						
Format	Log mag	LOGM	1	0,1		
	Phase	PHAS	1	0,1		
	Delay	DELA	1	0,1		
	Smith chart	SMIC	1	0,1		
	Polar	POLA	1	0,1		
	Lin mag	LINM	1	0,1		
	Real	REAL	1	0,1		
	Imaginary	IMAG	1	0,1		
	SWR	SWR	1	0,1		
LOCAL						
HP-IB modes	Talker/listener	TALKLIST	1	0,1		
	Use pass control	USEPASC	1	0,1		
Debug	Display commands	DEBU<ON|OFF>	2	1,0		
Disk drive	Unit	DISCUNIT[D]	3	D		0 to 30
	Volume	DISCVOLU[D]	3	D		0 to 30
HP-IB addresses	Plotter	ADDRPLOT[D]	3	D		0 to 30
	Printer	ADDRPRIN[D]	3	D		0 to 30
	Disk drive	ADDRDISC[D]	3	D		0 to 30
	Controller	ADDRCONT[D]	3	D		0 to 30
		PCB[D]				
Power meter	Address	ADDRPOWM[D]	3			0 to 30
	Type	POWM<ON|OFF>	2	0,1		On = 436A, Off = 438A/437B
Select plotter type	Plotter	PLTTYPPLTR	1			
	HPGL printer	PLTTYPHPGL	1			
Select printer type	ThinkJet	PRNTYPTJ	1			
	DeskJet	PRNTYPDJ	1			
	LaserJet	PRNTYPLJ	1			
	PaintJet	PRNTYPPJ	1			
	Epson-P2	PRNTYPEP	1			
	DJ 540	PRNTYP540	1			

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
LOCAL (continued)						
Select printer port	HP-IB	PRNPRTHPIB	1			
	Parallel	PRNPRTPARA	1			
	Serial	PRNPRTSERI	1			
Select plotter port	HP-IB	PLTPRTHPIB	1			
	Parallel	PLTPRTPARA	1			
	Serial	PLTPRTSERI	1			
	Disk	PLTPRTDISK	1			
Printer serial port	Baud rate	PRNTRBAUD[D]	3	D		1200, 2400, 4800, 9600, 19200
Printer serial port	Handshake	PRNHNDSHK<XON|DTR>	2	1,0		
Plotter serial port	Baud rate	PLTTRBAUD[D]	3	D		1200, 2400, 4800, 9600, 19200
Plotter serial port	Handshake	PLTHNDSHK<XON|DTR>	2	1,0		
Parallel port	Configure	PARAL<GPIO|CPY>	2	0,1		GPIO = Gen.Purpose I/O, CPY = COPY use
MEAS						
Input ports	A/R	AR	1	0,1		
	B/R	BR	1	0,1		
	A/B	AB	1	0,1		
	A	MEASA	1	0,1		
	B	MEASB	1	0,1		
	R	MEASR	1	0,1		
	Selects testport 1 or 2	TSTP<P1|P2>	2			
Analog input		ANAI[D]	1*	0,1		
S-parameters	S11	S11	1	0,1		
		RFLP	1	0,1		
	S12	S12	1	0,1		
	S21	S21	1	0,1		
		TRAP	1	0,1		
	S22	S22	1	0,1		
Conversion to alternate parameters	Off	CONVOFF	1	0,1		
	Z:reflection	CONVZREF	1	0,1		
	Z:transmission	CONVZTRA	1	0,1		
	Y:reflection	CONVYREF	1	0,1		
	Y:transmission	CONVYTRA	1	0,1		
	1/S	CONV1DS	1	0,1		

* Syntax type 1 when ANABOFF. Syntax type 3, and range = 1 to 31, when ANABON. Refer to the *HP 8753D Network Analyzer Service Guide* for information on the analog bus.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
MENU (stimulus)						
Power	Level	POWE[D]	3	D		−85 to +20 dBm
	Trip	POWT<ON|OFF>	2	1,0		
	Always couple power	COUP<ON|OFF>	2	1,0		
	Port power coupling	PORTP<CPLD|UNCPLD>	2	1,0		
	Range 0	PRAN0	1	0,1		
	Range 1	PRAN1	1	0,1		
	Range 2	PRAN2	1	0,1		
	Range 3	PRAN3	1	0,1		
	Range 4	PRAN4	1	0,1		
	Range 5	PRAN5	1	0,1		
	Range 6	PRAN6	1	0,1		
	Range 7	PRAN7	1	0,1		
	Power range auto/manual	PWRR<PAUTO|PMAN>	2	0,1		
	Source power on/off	SOUP<ON|OFF>	2	1,0		
Test set attenuation	Port 1	ATTP1[D]*	3	D		0, 10, 20 . . . 70 dB
	Port 2	ATTP2[D]*	3	D		0, 10, 20 . . . 70 dB
Time	Specify	SWET[D]	3	D		0.01 to 86,400 s
	Selects fastest sweep time	SWEA	1			
Measurement	Restart	REST	1			

*Option 011 only.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
MENU (stimulus) (continued)						
Trigger	Hold	HOLD	1	0,1		
		TRIG				
	Single	SING	1		OPC	
	Number of groups	NUMG[D]	3		OPC	1 to 999
	Continuous	CONT	1	0,1		
		FRER				
	External trigger off	EXTTOFF	2	0,1	OPC	
	External trigger on sweep	EXTTON	2	0,1	OPC	
	External trigger on point	EXTTPOIN	1	0,1	OPC	
	Manual trigger on point	MANTRIG	1	0,1	OPC	
Points	Specify	POIN[D]	3	D		3, 11, 26, 51, 101 201, 401, 801, 1601
Coupled channels	On/off	COUC<ON|OFF>	2	1,0		
CW freq	Set value	CWFREQ[D]	3	D		Stimulus range†
Power slope	Value	SLOPE[D]	3	D		−2 to 2 dB/GHz
	On/off	SLOPO<ON|OFF>	2	1,0		
Sweep type	Linear	LINFREQ	1	0,1		
	Log	LOGFREQ	1	0,1		
	List	LISFREQ	1	0,1		
	Select a segment	SSEG[D]	3	0,1		1 to 30
	Select all segments	ASEG	1	0,1		
	Power	POWS	1	0,1		
	CW time	CWTIME	1	0,1		
Edit list	Begin	EDITLIST	1			
	Add segment	SADD	1			
	Edit segment N	SEDI[D]	3	D		1 to 30
	Delete segment	SDEL	1			
	Done	EDITDONE	1			
	Clear list	CLEL	1			

† For frequency or power sweeps, refer to Chapter 12, "Preset State and Memory Allocation," in the *HP 8753D User's Guide.* For CW time: 0 to 24 hours. For frequency sweep, transform on: ± 1/frequency step. For CW time sweep, transform on: ±1/time step.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
MENU (stimulus) (continued)						
Edit segment	Start	STAR[D]	3	D		Stimulus range†
	Stop	STOP[D]	3	D		Stimulus range†
	Center	CENT[D]	3	D		Stimulus range†
	Span	SPAN[D]	3	D		Stimulus range†
	Points	POIN[D]	3	D		1 to 1632
	Stepsize	STPSIZE[D]	3	D		Stimulus range†
	CW	CWFREQ[D]	3	D		Stimulus range†
	Done with segment	SDON	1			
Single/All segment	Single segment sweep	SSEG[D]	1			
	All segment sweep	ASEG	1			
MARKER						
Select active	1 to 5	MARK<I>[D]	3	D		Stimulus range†
	All off	MARKOFF	1	0,1		
Marker zero	Zero offsets	MARKZERO	1			
Delta reference	1 to 5	DELR<I>	2	0,1		1 to 5
	Fixed marker	DELRFIXM	1	0,1		
	Mode off	DELO	1	0,1		
Fixed mkr position	Stimulus	MARKFSTI[D]	3	D		Stimulus range†
	Value	MARKFVAL[D]	3	D		Amplitude range#
	Aux value	MARKFAUV[D]	3	D		Amplitude range#
MARKER FCTN						
Marker placement	Discrete	MARKDISC	1	0,1		
	Continuous	MARKCONT	1	0,1		
Coupled	Couple channels	MARKCOUP	1	0,1		
	Uncouple	MARKUNCO	1	0,1		
Displayed	On/off	DISM<ON|OFF>	2	1,0		
Polar markers	Log	POLMLOG	1	0,1		
	Linear	POLMLIN	1	0,1		
	Re/Im	POLMRI	1	0,1		

† For frequency or power sweeps, refer to Chapter 12, "Preset State and Memory Allocation," in the *HP 8753D User's Guide.* For CW time: 0 to 24 hours. For frequency sweep, transform on: ± 1/frequency step. For CW time sweep, transform on: ±1/time step.

For log mag: ± 500 dB. For phase: ± 500 degrees. For Smith chart and Polar: ± 500 units. For linear magnitude: ± 500 units. For SWR: ± 500 units. The scale is always positive, and has minimum values of .001 dB, 10e-12 degrees, 10e-15 seconds, and 10 picounits.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
MARKER FCTN (continued)						
Smith markers	Linear	SMIMLIN	1	0,1		
	Log	SMIMLOG	1	0,1		
	Re/Im	SMIMRI	1	0,1		
	R+jX	SMIMRX	1	0,1		
	G+jB	SMIMGB	1	0,1		
Statistics	On/off	MEASTAT<ON|OFF>	2	1,0		
Set function to marker value	Start	MARKSTAR	1			
	Stop	MARKSTOP	1			
	Center	MARKCENT	1			
	Span	MARKSPAN	1			
	Reference	MARKREF	1			
	Delay	MARKDELA	1			
Search	Off	SEAOFF	1	0,1		
	Maximum	SEAMAX MARKMAXI	1	0,1		
	Minimum	SEAMIN MARKMINI	1	0,1		
	Target	SEATARG[D]	3	D		Amplitude range#
	Search left	SEAL	1			
	Search right	SEAR	1			
Width	Value	WIDV[D]	3	D		Amplitude range#
	Width on/off	WIDT<ON|OFF>	2	1,0		
Tracking search	On/off	TRACK<ON|OFF>	2	1,0		

For log mag: ± 500 dB. For phase: ± 500 degrees. For Smith chart and Polar: ± 500 units. For linear magnitude: ± 500 units. For SWR: ± 500 units.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
SAVE/RECALL-internal registers						
Save	Selected reg	SAVE<I>	2		OPC	1 to 5
	Selected reg	SAVEREG<I>	2		OPC	01 to 31
Clear	Selected reg	CLEA<I>	2		OPC	1 to 5
	Selected reg	CLEAREG<I>	2		OPC	01 to 31
	All regs	CLEARALL	1		OPC	
Recall	Selected reg	RECA<I>	2		OPC	1 to 5
	Selected reg	RECAREG<I>	2		OPC	01 to 31
Title	Internal reg	TITR<I>[$]	4			1 to 5, 10 char.
	Internal reg	TITREG<I>[$]	4			01 to 31, 10 char.
	Save state file	TITF0<I>[$]	4			01 to 31, 10 char.
	Plot	TITP<I>[$]	4			01 to 31, 10 char.
SAVE/RECALL-disk files						
Purge	Selected file§	PURG<I>	2			1 to 5
Store	To disk§	STOR<I>	2			1 to 5
Title	Disk file	TITF<I>[$]	4			1 to 5, 10 char.
	Copy labels from file titles	COPYFRFT	1			
	Copy labels from register titles	COPYFRRT	1			
Include with disk	Data (error corrected, real and imaginary pairs)*	EXTMDATA<ON|OFF>	2	1,0		
files	Raw data	EXTMRAW<ON|OFF>	2	1,0		
	Formatted data	EXTMFORM<ON|OFF>	2	1,0		
	User graphics	EXTMGRAP<ON|OFF>	2	1,0		
	Data only (error corrected, real and imaginary pairs)*	EXTMDATO<ON|OFF>	2	1,0		
Save format	Binary	SAVUBINA	1			
	ASCII/CITIFile	SAVUASCI	1			
Load	From disk§	LOAD<I>	2			1 to 5
	Recall file titles§	REFT	1			

§ Requires pass control mode when using the HP-IB port.
*See Figure 1-1. This error corrected data is the same as that output by the command OUTPDATA.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
SAVE/RECALL-disk files (continued)						
Initialize	Internal disk	INID	1			
	External disk	INIE	1			
	LIF Directory size	DIRS[D]	3	D		256 to 8192
Select storage	Internal memory	INTM	1			
	Internal disk	INTD	1			
	External disk	EXTD	1			
	Internal disk	INTD	1			
Disk format	DOS	FORMATDOS	1			
	LIF	FORMATLIF	1			
SCALE REF						
Scale	Auto	AUTO	1			
	Value	SCAL[D]	3	D		Amplitude range#
Reference	Position	REFP[D]	3	D		0 to 10
	Value	REFV[D]	3	D		Amplitude range#
	Set to mkr	MARKREF	1			
Delay	Set delay	ELED[D]	3	D		± 10.0 s
	Coaxial delay	COAD	1			
	Waveguide delay	WAVD	1			
Phase	Offset	PHAO[D]	3	D		360 deg
SEQ-sequencing						
Sequencing menu	Continue sequence	CONS	1			
	Do sequence	DOSEQ<I>	2			1 to 6
	Gosub sequence	GOSUB<I>	2			1 to 6
	New/modify sequence	NEWSE<I>	2			1 to 6
	Pause to select seq.	PTOS	1			
	Done modify	DONM	1			
	Select sequence	SEQ<I>	2	I		1 to 6
		Q<I>				
	Duplicate seq. X to seq. Y	DUPLSEQ<X>SEQ<Y>	2			X, Y = 1 to 6
	Print sequence I	PRINSEQ<I>	2			1 to 6
	Begin title sequence	TITSQ	1			
	Title sequence I	TITSEQ<I>[$]	2			1 to 6, 10 char.
	Clear sequence I	CLEASEQ<I>	2			1 to 6

For log mag: ± 500 dB. For phase: ± 500 degrees. For Smith chart and Polar: ± 500 units. For linear magnitude: ± 500 units. For SWR: ± 500 units. The scale is always positive, and has minimum values of .001 dB, 10e-12 degrees, 10e-15 seconds, and 10 picounits.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
SEQ-sequencing (continued)						
TTL I/O	TTL out high continuously	TTLOH	1			
	TTL out low continuously	TTLOL	1			
	TTL low - end sweep high	TTLHPULS	1			
	TTL high - end sweep low	TTLLPULS	1			
	Testset I/O forward	TSTIOFWD[D]	3	D		0 to 7
	Testset I/O reverse	TSTIOREV[D]	3	D		0 to 7
	Programs all GPIO output bits	PARAOUT[D]	3	D		0 to 255
	Set specified bit on GPIO	SETBIT[D]	3	D		0 to 7
	Clear specified bit on GPIO	CLEABIT[D]	3	D		0 to 7
	Specify input GPIO bit for IFBI	PARAIN[D]	3	D		0 to 4
	Input GPIO bit high - do SEQ<I>	IFBIHIGH	1			
	Input GPIO bit low - do SEQ<I>	IFBILOW	1			
Save/recall sequences	Store sequence I to disk§	STORSEQ<I>	2			1 to 6
	Recall sequence I from disk§	LOADSEQ<I>	2			1 to 6

§ Requires pass control when using the HP-IB port.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
SEQ-sequencing (continued)						
Special functions	Peripheral address	ADDRPERI[D]	3	D		
	Title to peripheral	TITTPERI	1			
	Wait D seconds	SEQWAIT[D]	3	D		0.1 to 3000 s
	Pause	PAUS	1			
	Marker to CW freq.	MARKCW	1			
	Emit beep	EMIB	1			
	Title to HP-IB printer	TITTPRIN	1			
	Title to pwr mtr/HPIB	TITTPMTR	1			
	Show menus	SHOM	1			
	Assert seq. status bit	ASSS	1			
	Read pwr mtr/HP-IB into title string	PMTRTTIT	1			
	Send number into trace memory	TITTMEM	1			
Decision making	If limit test pass then do sequence I	IFLTPASSSEQ<I>	2			1 to 6
	If limit test fail then do sequence I	IFLTFAILSEQ<I>	2			1 to 6
Loop counter	Set value	LOOC[D]	3			0 to 32,760
	Increment by 1	INCRLOOC				
	Decrement by 1	DECRLOOC				
	If counter equals 0 then do sequence	IFLCEQZESEQ<I>	2			1 to 6
	If counter not equal to 0 then do sequence	IFLCNEZESEQ<I>	2			1 to 6

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
		STIMULUS				
Stimulus	Center	CENT[D]	3	D		Stimulus range†
	Span	SPAN[D]	3	D		Stimulus range†
	Start	STAR[D]	3	D		Stimulus range†
	Stop	STOP[D]	3	D		Stimulus range†
		SYSTEM				
Set clock	Time stamp	TIMESTAM<ON|OFF>	2	1,0		
	Set date	SETDATE[$]	3			DD MMM YYY
	Set time	SETTIME[$]	3			HH:MM:SS
Configure	Sampler, attenuator offsets	RAWOFFS<ON|OFF>	2	1,0		
	Spur avoidance	SM8<ON|OFF>	2	1,0		
Harmonic mode	Off	HARMOFF	1	0,1	OPC	
	Second	HARMSEC	1	0,1	OPC	
	Third	HARMTHIR	1	0,1	OPC	
Instrument mode	Network analyzer	INSMNETA	1	0,1	OPC	
	Ext. source auto	INSMEXSA	1	0,1	OPC	
	Ext. source manual	INSMEXSM	1	0,1	OPC	
	Tuned receiver	INSMTUNR	1	0,1	OPC	
Service	Analog bus	ANAB<ON|OFF>	2	1,0		
	Sampler correction	SAMC<ON|OFF>	2	1,0		
Frequency offset	On/off	FREQOFFS<ON|OFF>	2	1,0	OPC	
	Value	VOFF[D]	3	D		frequency range of instrument
	Set RF > LO	RFGTLO	1			
	Set RF < LO	RFLTLO	1			
	Select up converter	UCONV	1			
	Select down converter	DCONV	1			
LO	Frequency:CW	LOFREQ[D]	3	D		
	Frequency:start	LOFSTAR[D]	1	D		
	Frequency:stop	LOFSTOP[D]	1	D		
	Frequency:sweep	LOFSWE	1			
	Power:fixed	LOPOWER[D]	1	D		
	Power:start	LOPSTAR[D]	1	D		
	Power:stop	LOPSTOP[D]	1	D		
	Power:sweep	LOPSWE	1			
	LO control	LOCONT<ON|OFF>	2	1,0		
	Source address	ADDRLSRC[D]	3	D		
	View measurement/mixer setup	VIEM<ON|OFF>	2	1,0		

† For frequency or power sweeps, refer to Chapter 12, "Preset State and Memory Allocation," in the *HP 8753D User's Guide.* For CW time: 0 to 24 hours. For frequency sweep, transform on: ± 1/frequency step. For CW time sweep, transform on: ±1/time step.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
SYSTEM-limit testing						
Limit line	On/off	LIMILINE<ON|OFF>	2	1,0		
Limit test	On/off	LIMITEST<ON|OFF>	2	1,0		
	Beeper	BEEPFAIL<ON|OFF>	2	1,0		
Limit offset	Stimulus	LIMISTIO[D]	3	D		Stimulus range†
	Amplitude	LIMIAMPO[D]	3	D		Amplitude range#
	Marker to offset	LIMIMAOF	1			
Edit table	Begin edit	EDITLIML	1			
	Add segment	SADD	1			
	Edit segment D	SEDI[D]	3	D		1 to 18
	Delete segment	SDEL	1			
	Done with edit	EDITDONE	1			
	Clear list	CLEAL	1			
Edit segment	Stimulus value	LIMS[D]	3	D		Stimulus range†
	Marker to stimulus	MARKSTIM	1			
	Upper limit	LIMU[D]	3	D		Amplitude range#
	Lower limit	LIML[D]	3	D		Amplitude range#
	Delta limits	LIMD[D]	3	D		Amplitude range#
	Middle value	LIMM[D]	3	D		Amplitude range#
	Marker to middle	MARKMIDD	1			
	Segment done	SDON	1			
Limit type	Flat line type	LIMTFL	1	0,1		
	Sloping line type	LIMTSL	1	0,1		
	Single point type	LIMTSP	1	0,1		

† For frequency or power sweeps, refer to Chapter 12, "Preset State and Memory Allocation," in the *HP 8753D User's Guide.* For CW time: 0 to 24 hours. For frequency sweep, transform on: ± 1/frequency step. For CW time sweep, transform on: ±1/time step.

For log mag: ± 500 dB. For phase: ± 500 degrees. For Smith chart and Polar: ± 500 units. For linear magnitude: ± 500 units. For SWR: ± 500 units. The scale is always positive, and has minimum values of .001 dB, 10e-12 degrees, 10e-15 seconds, and 10 picounits.

Table 1-10. Key Select Codes (continued)

Function	Action	Mnemonic	S	?	O	Range
SYSTEM-transform						
Transform	Time Domain Transform On/off	TIMDTRAN<ON|OFF>	2	0,1	OPC	
Set freq	Low pass	SETF	1			
Mode	Low pass impulse	LOWPIMPU	1	0,1		
	Low pass step	LOWPSTEP	1	0,1		
	Bandpass	BANDPASS	1	0,1		
	Specify gate menu	SPEG	1			
Window	Maximum	WINDMAXI	1			
	Normal	WINDNORM	1			
	Minimum	WINDMINI	1			
	Any value	WINDOW[D]	3	D		State dependent
Window shape	Use trace memory	WINDUSEM<ON|OFF>	2	1,0		
Demodulation	Off	DEMOOFF	1	0,1		
	Amplitude	DEMOAMPL	1	0,1		
	Phase	DEMOPHAS	1	0,1		
Gate	On/off	GATEO<ON|OFF>	2	1,0	OPC	
	Start	GATESTAR[D]	3	D		Stimulus range†
	Stop	GATESTOP[D]	3	D		Stimulus range†
	Center	GATECENT[D]	3	D		Stimulus range†
	Span	GATESPAN[D]	3	D		Stimulus range†
Gate shape	Maximum	GATSMAXI	1	0,1		
	Wide	GATSWIDE	1	0,1		
	Normal	GATSNORM	1	0,1		
	Minimum	GATSMINI	1	0,1		

† For frequency or power sweeps, refer to Chapter 12, "Preset State and Memory Allocation," in the *HP 8753D User's Guide.* For CW time: 0 to 24 hours. For frequency sweep, transform on: ± 1/frequency step. For CW time sweep, transform on: ±1/time step.

HP-IB Only Commands

Table 1-10. HP-IB Only Commands

Action	Mnemonic	Syntax	?	Description
MISCELLANEOUS				
Identify instrument	IDN?	1		Outputs the identification string: "HEWLETT PACKARD, 87NND,0,X.XX", where 87NND is the model number of the instrument and X.XX is the firmware revision of the instrument.
Key	KEY[D]	1	D	Imitates pressing a key. The data transmitted is the key code, as defined in Figure 1-6. Range for D = 1 to 61.
Key code	KOR?	1		Outputs last key code or knob count. If the reply is positive, it is a key code. If it is negative, then set bit 15 equal to bit 14, and the resulting two byte integer is the RPG knob count. It can be either positive or negative. There are about 120 counts per turn.
Move marker	MARKBUCK[D]	2	D	Moves the marker to the selected point on the trace. On a 201 point sweep, D can range from 0 to 200.
On completion	OPC	1		Causes reporting of the last OPC-compatible command completion.
Plot/print softkeys	PSOFT<ON|OFF>	2		Includes the softkey menu keys when printing or plotting the screen.
Copy default	DEFLTCPIO	1		Sets up a default state for copy.
Revision	SOFR	1		Displays the software revision on the analyzer.
Learn string	SELL[D]	2	D	Selects the learn string revision to input to and output from the analyzer. The valid parameters are: 0: Defaults to current revision. 201: Revision 8753B 2.01 300: Revision 8753B 3.00 401: Revision 8753C 4.01 402: Revision 8753C 4.02 412: Revision 8753C 4.12 413: Revision 8753C 4.13 500: Revision 8753D 5.00 520: Revision 8753D 5.20 526: Revision 8753D 5.26 534: Revision 8753D 5.34 536: Revision 8753D 5.36 538: Revision 8753D 5.38 540: Revision 8753D 5.40 542: Revision 8753D 5.42 546: Revision 8753D 5.46 548: Revision 8753D 5.48 612: Revision 8753D 6.12

Table 1-11. HP-IB Only Commands (continued)

Action	Mnemonic	Syntax	?	Description
MISCELLANEOUS (continued)				
Sweep start	SWPSTART	1		This OPC-compatible command initiates a sweep and immediately releases the HP-IB bus, allowing the analyzer to initiate data output as soon as the appropriate data is ready. Use in conjunction with Take4 mode only.
Collect raw data	TAKE4<ON|OFF>	2	1,0	This command initiates a mode in which every measurement cycle is characterized by sweeping in both the forward and reverse directions and collecting raw data for all four S-parameters. The sweeping can occur when a SWPSTART or SING command is received or when the analyzer is in continuous, number of groups, or external trigger mode.
Self test	TST?	1		Causes a self test. Returns a zero if the test passes.
No operation	NOOP	1		Creates a cycle that has no operation. OPC compatible.
Select 1-port cal	CAL1	1		Provides access to functions within the 1-port cal menu. (HP 8510 compatibility.)
External trigger	EXTTHIGH	1		Sets the trigger polarity high.
	EXTTLOW	1		Sets the trigger polarity low.
Wait	WAIT	1		Makes the analyzer wait for a clean sweep when used with the OPC command.
INPUT				
Error-corrected Data	INPUDATA[D]	3	D	Inputs error-corrected data.
Formatted Data	INPUFORM[D]	3	D	Inputs formatted data.
Raw Data	INPURAW1[D]	3	D	Inputs raw data.
	INPURAW2[D]	3	D	
	INPURAW3[D]	3	D	
	INPURAW4[D]	3	D	
Error coefficient	INPUCALC<01, 02, ... 12>	2		Inputs an individual error coefficient array. Issue the command `CALIXXXX;`(XXXX specifies the data calibration type), then input each of the appropriate individual error coefficients using `INPUCALC`. Finally, issue `SAVC;` and trigger a sweep.
	SAVC	1		This OPC compatible command denotes completion of the error coefficients transfer to the instrument.
Power meter cal.	INPUPMCAL<I>	3		Inputs power meter cal array. Values should be entered as 100 times the power meter reading in dB.
Cal kit	INPUCALK[D]	3	D	Input a cal kit.
Learn string	INPULEAS[D]	3	D	Inputs the learn string. Preceded by SELL if learn string is not current revision.

Table 1-11. HP-IB Only Commands (continued)

Action	Mnemonic	Syntax	?	Description
OUTPUT				
Active function	OUTPACTI	1		Outputs value of function in active entry area in ASCII format.
Active channel	OUTPCHAN	1		Outputs the active channel number.
Options	OUTPOPTS	1		Outputs an ASCII string of the options installed.
Serial number	OUTPSERN	1		Outputs the serial number of the analyzer.
Identify instrument	OUTPIDEN	1		See IDN?
Error coefficient	OUTPCALC<01,02 ... 12>	2		Outputs the selected error coefficient array from the active channel. Each array is the same as a data array. See Table 1-7, for the contents of the arrays.
Interp. cal.	OUTPICAL<I>	2		Outputs the selected interpolated cal coefficient array.
Cal kit	OUTPCALK	1		Outputs the active cal kit, a less than 1000 byte string in FORM 1.
Data	OUTPDATA	1		Outputs the error corrected data from the active channel in real/imaginary pairs. See Figure 1-4.
	OUTPDATF	1		Fast data transfer command for OUTPDATA.
Error	OUTPERRO	1		Outputs the oldest error in the error queue. The error number is followed by the error message in ASCII format (FORM 4).
Formatted	OUTPFORM	1		Outputs the formatted trace data from the active channel in current display units. See Table 1-3 for data transferred.
	OUTPFORF	1		Fast data transfer command for OUTPFORM. Only the first number of the OUTPFORM data pairs is transferred. See Table 1-4.
Power meter cal.	OUTPIPMCAL<I>	2		Outputs the interpolated power meter cal array for channel 1 or channel 2.
Power meter cal.	OUTPPMCAL<I>	2		Outputs power meter cal array for channel 1 or channel 2. Values are sent as 100 times the power meter reading in dB.
Key code	OUTPKEY	1		Outputs the code of the last key pressed, in ASCII format. See Figure 1-6 for key codes. −1 is transmitted for a knob turn.

Table 1-11. HP-IB Only Commands (continued)

Action	Mnemonic	Syntax	?	Description
OUTPUT (continued)				
Learn string	OUTPLEAS	1		Outputs the learn string in binary, not intended for decoding.
External source	OUTPRFFR	1		Outputs external source RF frequency when in external source instrument mode.
Smoothing	OUTPAPER	1		Outputs the smoothing aperture.
Sequencing	OUTPSEQ<I>	2		Outputs sequence I (I = 1 to 6) listing over HP-IB.
Limit failures	OUTPLIMF	1		Outputs the limit results as described under OUTPLIML for only those stimulus points that failed.
Limit list	OUTPLIML	1		Outputs the limit test results for each stimulus point. The results consist of four numbers. The first is the stimulus value tested, the second is the test result:—1 for no test, 0 for fail, 1 for pass. The third number is the upper limit value, and the fourth is the lower limit value. This is an ASCII transfer (FORM 4).
Limit marker	OUTPLIMM	1		Outputs the limit test results as described for OUTPLIML for the active marker.
Marker	OUTPMARK	1		Outputs the active marker values in 3 numbers. The first two numbers are the marker values, and the last is the stimulus value. See Table 1-3 for the marker values.
Memory	OUTPMEMO	1		Outputs the memory trace from the active channel. It is error corrected data in real/imaginary pairs, and can be treated the same as data from OUTPDATA.
	OUTPMEMF	1		Fast data transfer command for OUTPMEMO.
Marker statistics	OUTPMSTA	1		Outputs marker statistics: mean, standard deviation, and peak to peak deviation. ASCII format (FORM 4).
Bandwidth	OUTPMWID	1		Outputs results of bandwidth search:bandwidth, center, and Q. ASCII format (FORM 4).
Bandwidth + loss	OUTPMWIL	1		Same operation as OUTPMWID plus the loss value.
Plot	OUTPPLOT	1		Outputs the HP-GL plot string in ASCII format to the HP-IB port. Can be directed to an HP-GL plotter or printer.

Table 1-11. HP-IB Only Commands (continued)

Action	Mnemonic	Syntax	?	Description
OUTPUT (continued)				
Print	OUTPPRIN	1		Outputs the print string of the display graphics.
	OUTPPRNALL	1		Outputs all pages List Values or current page of Operating and marker parameters in ASCII. Activate the desired function with LISV to print values or OPEP to print operating parameters prior to this command.
Pre-raw data	OUTPPRE1	1		Array 1 (S11 data). Analogous to OUTPRAW except that pre-raw data has not had sampler correction nor attenuator offsets applied. Use in conjunction with Take4 mode only.
	OUTPPRE2	1		Array 2 (S21 data).
	OUTPPRE3	1		Array 3 (S12 data).
	OUTPPRE4	1		Array 4 (S22 data).
Raw data	OUTPRAW1	1		Array 1 (S11 data).Outputs uncorrected data arrays for the active channel. Raw 1 holds the single parameter data unless a 2-port calibration is on, in which case raw 1 holds S11 and the following arrays hold S21, S12, and S22, respectively. The data is in real/imaginary pairs.
	OUTPRAW2	1		Array 2 (S21 data).
	OUTPRAW3	1		Array 3 (S12 data).
	OUTPRAW4	1		Array 4 (S22 data).
	OUTPRAF<I>	1		Fast data transfer command for OUTPRAW<I>.
Status byte	OUTPSTAT	1		Outputs the status byte. ASCII format (FORM 4).
	STB?			
Display title	OUTPTITL	1		Outputs the display title. ASCII format (FORM 4).
Max values	OUTPAMAX*	1		Outputs max values for all limit line segments.
Min values	OUTPAMIN*	1		Outputs min values for all limit line segments.
Min/max values	OUTPSEGAM*	1		Outputs limit test min/max all segs. Outputs the segment number, max stimulus, max value, min stimulus, min value for all active segments.†
Min/max value	OUTPSEGM*	1		Outputs limit test min/max for a specified segment. See SELSEG[D].†

† For the definition of a limit segment, see "Example Display of Limit Lines" in the Chapter 2 section titled "Limit Line and Data Point Special Functions."

* Refer to the "Limit Line and Data Point Special Functions" section in Chapter 2.

Table 1-11. HP-IB Only Commands (continued)

Action	Mnemonic	Syntax	?	Description
OUTPUT (continued)				
Data: point	OUTPDATP	1		Outputs trace data indexed by point. (see SELPT[D])
Data: range	OUTPDATR	1		Outputs trace data for range of points. (see SELMINPT[D], SELMAXPT[D])
Limit test: ch1	OUTPLIM1*	1		Outputs status§ of limit test for channel 1.
Limit test: ch2	OUTPLIM2*	1		Outputs status§ of limit test for channel 2.
Limit test status	OUTPSEGAF*	1		Outputs the segment number and its limit test status§for all active segments.†
Limit test status	OUTPSEGF*	1		Outputs the limit test status§ for a specified segment. See SELSEG[D].†
Fail report	OUTPFAIP*	1		This command is similar to OUTPLIMF except that it reports the number of failures first, followed by the stimulus and trace values for each failed point in the test.
Clock	READDATE	1		Outputs the date of the clock in the following format: DD MMM YYYY
Clock	READTIME	1		Outputs the time of the clock in the following format: HH:MM:SS
LIMIT LINE AND DATA POINT TEST				
Min/max recording	MINMAX<ON|OFF>*	2	1,0	Enables/disables min/max recording per segment. Min and max values are recorded per limit segment.
Segment	SELSEG[D]*	3	D	Selects segment number for the OUTPSEGF and OUTPSEGM commands to report on. D can range from 1 to 18.†
Last point	SELMAXPT[D]	3	D	Selects the last point number in the range of points that the OUTPDATR command will report. D can range from 0 to the number of points minus 1.
First point	SELMINPT[D]	3	D	Selects the first point number in the range of points that the OUTPDATR command will report. D can range from 0 to the number of points minus 1.
Specify point	SELPT[D]	3	D	Selects point number that the OUTPDATR command will report. D can range from 0 to the number of points minus 1.

* Refer to the "Limit Line and Data Point Special Functions" section in Chapter 2.

§ Values returned for limit test status are: 1 (PASS), 0 (FAIL), -1 (NO_LIMIT)

† For the definition of a limit segment, see "Example Display of Limit Lines" in the Chapter 2 section titled "Limit Line and Data Point Special Functions."

Table 1-11. HP-IB Only Commands (continued)

Action	Mnemonic	Syntax	?	Description
OUTPUT FORMATS				
	FORM1	1		HP 8719/20/22 internal format, with header.
	FORM2	1		32 bit floating point, with header (IEEE).
	FORM3	1		64 bit floating point, with header (IEEE).
	FORM4	1		ASCII format. No header.
	FORM5	1		32 bit PC format (bytes reversed).
SOFTKEYS				
Press	SOFT[I]	2		Activates softkey I, I = 1 to 8.
Label	WRSK<I>[$]	4		Writes label (10 char) to indicated softkey I, where I = 1 to 8. Initial use of this command requires previous commands MENUFORM; and MENUOFF;.
STATUS REPORTING				
Clear	CLES	1		Clears the status byte.
	CLS			
Interrogate	ESB?	1		Returns event-status register B.
	ESR?	1		Returns the event-status register.
	OUTPSTAT	1		Returns the status byte.
Enable	ESE[D]	1	D	Enables event-status register. (0<D<255)
	ESNB[D]	1	D	Enables event-status register B. (0<D<255)
	SRE[D]	1	D	Enables SRQ. (0<D<255)
MENUS				
Averaging	MENUAVG	1		
Calibration	MENUCAL	1		
Copy	MENUCOPY	1		
Display	MENUDISP	1		
Format	MENUFORM	1		
Marker	MENUMARK	1		
Meas	MENUMEAS	1		
Marker function	MENUMRKF	1		
Off	MENU<ON|OFF>	2		
Save Recall	MENURECA	1		
Save Recall	MENUSAVE	1		
Scale	MENUSCAL	1		
Stimulus	MENUSTIM	1		
System	MENUSYST	1		
Sequencing	MENUSEQU	1		