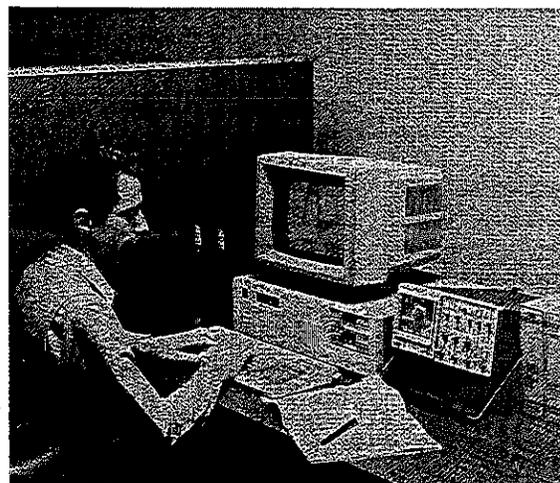


TEK

070-6602-00
Product Group 37

2440 GPIB

POCKET GUIDE



Tektronix
COMMITTED TO EXCELLENCE

CONTENTS

	Page
GPIB Command Reference.....	1-1
Alphabetical GPIB Command Reference	2-1
Event Tables	3-1
Character Charts	4-1

Copyright © 1988 Tektronix, Inc. All rights reserved. Contents of this publication may not be reproduced in any form without the written permission of Tektronix, Inc.

Products of Tektronix, Inc. and its subsidiaries are covered by U.S. and foreign patents and/or pending patents.

TEKTRONIX, TEK, SCOPE-MOBILE, and  are registered trademarks of Tektronix, Inc. TELEQUIPMENT is a registered trademark of Tektronix U.K. Limited.

Printed in U.S.A. Specification and price change privileges are reserved.

INSTRUMENT SERIAL NUMBERS

Each instrument has a serial number on a panel insert, tag, or stamped on the chassis. The first number or letter designates the country of manufacture. The last five digits of the serial number are assigned sequentially and are unique to each instrument. Those manufactured in the United States have six unique digits. The country of manufacture is identified as follows:

- B000000 Tektronix, Inc., Beaverton, Oregon, USA
- 100000 Tektronix Guernsey, Ltd., Channel Islands
- 200000 Tektronix United Kingdom, Ltd., London
- 300000 Sony/Tektronix, Japan
- 700000 Tektronix Holland, NV, Heerenveen, The Netherlands

INTRODUCTION

This guide contains two references of the GPIB commands listed in Appendix A of the Programmers Reference Guide included with the 2440. The first reference, "GPIB Command Reference," sorts the commands according to type: Vertical Commands, Horizontal Commands, etc.; the second reference, "Alphabetical GPIB Command Reference," according to the alphabetical order of the commands. Both lists omit the descriptions for the commands—consult Appendix A of the Programmers Reference Guide for those descriptions.

Also included in this guide are the Event Codes and their descriptions. These are codes which the 2440 issues over the GPIB that represent errors, warnings, and other messages of interest to System Programmers.

At the end of the guide are two charts. The first chart shows the character set the 2440 displays. The second chart shows ASCII symbols and their GPIB equivalents. See the Programmers Reference Guide for information on how to use these charts.

GPIB Command Reference

Throughout this Table (and the following Table), headers and arguments are listed in a combination of bold upper case and nonbold lower case letters. The instrument accepts any abbreviated header or argument containing at least all the characters shown in bold upper case. Any characters added to the abbreviated (upper case) version must be those shown in lower case. For a query, a question mark (?) must immediately follow the header. Link arguments shown in brackets ([]) are defaults (don't send the brackets as part of the argument). In any command that has a default, omitting the link argument sets the default. For example, 'RUN ACQUIRE' and 'RUN' are equivalent.

Some headers use numeric arguments in the ANSI X3.42 standard format. This format states that there are three types of numbers; integers, reals, and reals with exponents (these are called NR1, NR2, and NR3 respectively). Each type of number is composed of ASCII digits with the most significant digit sent first. Any of these three number types is acceptable whenever a numeric argument is required. Here are some examples of each of the three number types:

<NR1>	375,	0,	-23
<NR2>	+12.589,	1.37592,	-00037.5
<NR3>	-1.51E+03,	+51.2E-07,	+00.0E+00

Sometimes in one of the argument columns of this table <types> or <data src> appears and references a footnote at the bottom of the page. In this case, the argument to use is any one of those in the referenced footnote.

GPIB Command Reference

GPIB Command Reference

Vertical Commands

Trigger Commands

Header	Argument	Argument	Argument	
CH1(or CH2)	VOLts	<NR3>		
	VARIable	<NR3>		
	POSition	<NR3>		
	COUpling	AC DC GND		
	FIFty	[ON] OFF		
	INVert	[ON] OFF		
PROBe?	CH1 CH2 EXT1 EXT2			
	BWLimit	TWEnty HUNdred FULl		
	VMODE	CH1	[ON] OFF	
		CH2	[ON] OFF	
ADD		[ON] OFF		
MULT		[ON] OFF		
	DISPlay	XY YT		

Header	Argument	Argument	Argument	
ATRigger	MODE	AUTOLevel		
		AUTO NORmal SGLseq		
	SOURCE	CH1 CH2 LINE VERTical		
		EXT1 EXT2		
		LOGsrc	WORD A.B OFF	
		COUpling	AC DC LFRej HFRej NOIserej TV	
			LEVEL	<NR3>
	SLOpe	PLUs MINUs		
	POSition	<NR1>		
	HOLDoff	<NR3>		
	ABSElect	A B		
		MINimum		

Trigger Commands (cont)

Trigger Commands (cont)

Header	Argument	Argument	Argument
ATRigger (cont)	MAXimum		
	STATe		
	CLRstate		
INITAt50			
BTRigger	MODE	RUNSaft TRIGAft	
	EXTCLK	[ON] OFF	
	SOURCE	CH1 CH2 WORD VERTICAL EXT1 EXT2	
	COUpling	AC DC LFRej HFRej NOIserej	
	LEVel	<NR3>	
	SLOpe	PLUs MINUs	
	POSition	<NR1>	

Header	Argument	Argument	Argument
SETTV	ICOUpling	FLD1 FLD2 ALT TVLine	
		NICOUpling	FLD1 TVLine
		INTERlaced	
	TVClamp	[ON] OFF	
	TVLine	<NR1>	
	LCNTRreset	F1Only BOTH	
	LCNTStart	PREfld ATFld	
	SYNc	PLUs MINUs	
SETWord	RADix	OCT HEX	
	CLOCK	ASYNc FALl RISe	
	WORD	<ascii binary data>	
	PROBe		
MANtrig			
EXTGain	EXT1	DIV1 DIV5	
	EXT2	DIV1 DIV5	

GPIB Command Reference

Horizontal Commands

Header	Argument	Argument	Argument
HORizontal	MODe	ASWeep AINtb BSWeep	
	POStion	<NR3>	
	ASEcdiv	<NR3>	
	BSEcdiv	<NR3>	
	EXTExp	<NR1>	
DLYTime	DELTA	[ON] OFF	
	DLY1	<NR3>	
	DLY2	<NR3>	
DLYEvs	MODe	[ON] OFF	
	VALue	<NR1>	

GPIB Command Reference

Acquisition Commands

Header	Argument	Argument	
RUN	[ACQuire] SAVe		
ACQuire	MODe	NORmal ENV AVG	
	REPet	[ON] OFF	
	ERAsE		
	NUMEnv	<NR1> CONt	
	NUMAVg	<NR1>	
	SAVDeI	[ON] OFF	
	NUMACq		
SMOoth	ON OFF		

Saverref Commands

Header	Argument	Argument	Argument
SAVERef	[STACK]		
	REF1		
	REF2		
	REF3		
	REF4		
REFFrom	REF1		
	REF2		
	REF3		
	REF4		
	CH1Del		
	CH2Del		
	ADDDel		
	MULTDel		
	CH1		
	CH2		
	ADD		
	MULT		
	REFDisp	REF1	[ON] OFF EMPTy
REF2		[ON] OFF EMPTy	
REF3		[ON] OFF EMPTy	
REF4		[ON] OFF EMPTy	
REFPos	REF1	<NR3>	
	REF2	<NR1>	
	REF3	<NR1>	
	REF4	<NR1>	
	MODe	INDEpendent LOCK	

Display Commands

Header	Argument	Argument	Argument
INTENSity	DISPlay	<NR3>	
	REAdout	<NR3>	
	GRAt	<NR3>	
	INTENS	<NR3>	
	VECTors	[ON] OFF	
REAdout	[ON] OFF		
MENUoff			
MESSAge	<NR1>	"string"	
	CLRstate		

GPIB Command Reference

GPIB Command Reference

Cursor Commands

Cursor Commands (cont)

Header	Argument	Argument	Argument		
CURSOR	FUNCTION	VOLts			
		V.T			
		SLOpe			
		TIME			
	TARGET	ONE/Time	OFF		
			OFF		
		UNITS	TIME	CH1	
				CH2	
				ADD	
				MULT	
REF1					
REF2					
REF3					
REF4					
CH1Del					
CH2Del					
ADDDel					
MULTDel					
UNITS	TIME	BASe			
		PERCent			
		DEGrees			
UNITS	SLOpe	BASe			
		PERCent			
		DB			
UNITS	VOLts	BASe			
		PERCent			
		DB			
REFVolts	UNITS	V			
		VV			
		DIV			
		VALue	<NR3>		

Header	Argument	Argument	Argument
CURSOR (cont)	REFSlope	XUNit	SEC CLKs V VV DIV
		YUNit	V VV DIV
		VALue	<NR3>
		REFTime	UNIts SEC CLKs
	VALue		<NR3>
		NEWref	
	XPOs	ONE	<NR3>
		TWO	<NR3>
	YPOs	ONE	<NR3>
		TWO	<NR3>
TPOs	ONE	<NR3>	
	TWO	<NR3>	
MODE	DELTA		
	ABSOLute		
DISPlay	VALue		
	UNIts		
SELect	ONE		
	TWO		

Automatic Feature Commands

Automatic Feature Commands (cont)

Header	Argument	Argument	Argument
AUTOSetup	MODE	VIEW PERIOD RISe FALI PULSe	
	EXEcute RESolution	HI LO	
VALue?	<types> ^a		
UNIts?	<types> ^a		
MEASurement	DISPlay	[ON] OFF	
	MARK	[ON] OFF	
	WINDow	[ON] OFF	
	METHod	CURSor HISTogram MINMax	
	ONE	TYPE SOURCE DSOURCE	<types> ^a <data src> ^b <data src> ^b
	TWO	TYPE SOURCE DSOURCE	<types> ^a <data src> ^b <data src> ^b

Header	Argument	Argument	Argument
MEASurement (cont)	THRee	TYPE	<types> ^a
		SOURCE	<data src> ^b
		DSOURCE	<data src> ^b
	FOUR	TYPE	<types> ^a
		SOURCE	<data src> ^b
		DSOURCE	<data src> ^b
	DISTal	UNIts	PERCent VOLts
		PLEvel	<NR3>
		VLEvel	<NR3>
	MESIal	UNIts	PERCent VOLts
		PLEvel	<NR3>
		VLEvel	<NR3>
PROXimal	UNIts	PERCent VOLts	
	PLEvel	<NR3>	
	VLEvel	<NR3>	
DMESial	UNIts	PERCent VOLts	
	PLEvel	<NR3>	
	VLEvel	<NR3>	

^aDISTal, PROXimal, MESIal, MINimum, MAXimum, MID, TOP, BASE, MEAN, PK2pk, OVErshoot, UNDershoot, WIDth, PERIod, FREquency, DUTy, RISe, FALI, RMS, AREa, DELAy, DMESial

^bCH1, CH2, ADD, MULT, REF1, REF2, REF3, REF4, CH1Del, CH2Del, ADDDel, MULTDel

^aCH1, CH2, ADD, MULT, REF1, REF2, REF3, REF4, CH1Del, CH2Del, ADDDel, MULTDel

^bDISTal, PROXimal, MESIal, MINimum, MAXimum, MID, TOP, BASE, MEAN, PK2pk, OVErshoot, UNDershoot, WIDth, PERIod, FREquency, DUTy, RISe, FALI, RMS, AREa, DELAy, DMESial

GPIB Command Reference

GPIB Command Reference

Sequencer Commands

Output Commands

Header	Argument	Argument	Argument
SETUp	SAVe	ONE TWO THRee FOUr FIVe "ascii string"	
	RECall	ONE TWO THRee FOUr FIVe "ascii string"	
	ACTIon	<NR1> where: 1=Repeat 2=Selfcal 4=Selftest 8=Auto Setup 16=Print/Plot 32=Bell 64=SRQ 128=Pause 256=Protect	
	FORCe DELEte MEMory NAMes CLEar	[ON] OFF "ascii string"	
LLPrgm	"ascii string"		
PRGm?	"ascii string"	OFF	

Header	Argument	Argument	
DEVIce	TYPe	THInkjet HPGI	
	SETTIngs	[ON] OFF	
	GRAT	[ON] OFF	
	TEXT	[ON] OFF	
	WAVfrm	[ON] OFF	
	PAGesize	US A4	
PRInt			

GPIB Command Reference

Miscellaneous Commands

Header	Argument	Argument	Argument
ID?			
DEBUg	[ON] OFF		
HELp?			
INIT	PANel GPIb SRQ [BOTH]		
LONG	[ON] OFF		
SET?			
LLSet	<binary block>		
PATH	[ON] OFF		
BELI			
REM	"ascii string"		
TIME?			
DT	OFF RUN SODRUN STEp "ascii string"		

GPIB Command Reference

Waveform Commands

Header	Argument	Argument	Argument
WAVfrm?			
CURVe	<wfm data>		
DATA	ENCdg TARget SOURce DSOURce	ASCIi RPBinary RIBinary RIPartial RPPartial REF1 REF2 REF3 REF4 <types> ^a <types> ^a	

^aCH1, CH2, ADD, MULT, REF1, REF2, REF3, REF4, CH1Del, CH2Del, ADDDel, MULTDel

Waveform Commands (cont)

Waveform Data Commands

Header	Argument	Argument	Argument
WFMpre	WFId	"ascii string"	
	NR.Pt		
	PT.Fmt	Y ENV	
	XUNit	SEC	
	XINcr	<NR3>	
	PT.Off	<NR1>	
	YUNit	V VV DIV	
	YMUit	<NR3>	
	ENCdg	ASCii BINary	
	YOFf	<NR3>	
	BN.Fmt	RI RP	
FAStxmit	<NR1>		
	DELTa	CH1 CH2 BOTh	
	NORmal	CH1 CH2 BOTh	
	OFF ENCdg	RIBinary RPBinary RIPartial RPPartial	

Header	Argument	Argument	Argument
START	<NR1>		
STOP	<NR1>		
LEVel	<NR1>		
MAXimum?			
VMAXimum?			
MINimum?			
VMInimum?			
AVG?			
VAVg?			
PCRoss?			
NCRoss?			
SNAp			
PANS			
HYSteresis	<NR1>		
DIRection	PLUs MINUs		

GPIB Command Reference

Service Request Commands

Header	Argument	Argument	Argument
RQS	[ON] OFF		
OPC	[ON] OFF		
CER	[ON] OFF		
EXR	[ON] OFF		
EXW	[ON] OFF		
INR	[ON] OFF		
USER	[ON] OFF		
DEVDep	[ON] OFF		
PID	[ON] OFF		
EVEnt?			
BUSy?			
LOCK	ON OFF LLO		

GPIB Command Reference

Calibration and Diagnostic Commands

Header	Argument	Argument	Argument
TESTType	SELFcal SELFDiag EXTCAI EXTDiag		
TESTNum	<NR1>		
EXEcute			
ERRor?			
STEp			
LOOP	CONt FAI PASs ONE		
HALt			

Alphabetical GPIB Command Reference

Header	Argument	Argument	Argument
ACQUIRE	MODE	NORMAL ENV AVG	
	REPET	[ON] OFF	
	ERASE		
	NUMENV	<NR1> CONT	
	NUMAVG	<NR1>	
	SAVDEL	[ON] OFF	
	NUMACQ		

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
ATRigger	MODE	AUTOLevel	
		AUTO	
		NORmal	
		SGLseq	
		CH1	
	SOURCE	CH2	
		LINE	
		VERTical	
		EXT1	
		EXT2	
LOGsrc	WORD		
	A.B		
	OFF		
COUpling	AC		
	DC		
	LFRej		
	HFRcj		
	NOIserej		
	TV		
LEVel	<NR3>		
SLOpe	PLUs		
	MINUs		

Header	Argument	Argument	Argument
ATRigger (cont)	POSition	<NR1>	
	HOLdoff	<NR3>	
	ABSElect	A	
		B	
	MINImum		
	MAXimum		
	STATe		
CLRstate			
AUTOSetup	MODE	VIEw	
		PERIod	
		RISe	
		FALI	
	PULse		
EXEcute			
RESolution	HI		
	LO		
AVG?			
BELI			

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
BTRigger	MODE	RUNSoft TRigaft	
	EXTCLk	[ON] OFF	
	SOUrce	CH1 CH2 WORd VERTical EXT1 EXT2	
	COUplng	AC DC LFRrej HFRrej NOIserej	
	LEVel	<NR3>	
	SLOpe	PLUs MINUs	
	POSition	<NR1>	
BUSy?			
BWLimit	TWEnty HUNdred FULl		
CER	[ON] OFF		

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
CH1 (or CH2)	VOLts	<NR3>	
	VARIable	<NR3>	
	POSition	<NR3>	
	COUplng	AC DC GND	
	FIFTy	[ON] OFF	
CURSor	FUNction	[ON] OFF	
		VOLts	
		V.T	
		SLOpe	
		TIME	
	TARget	ONE/Time	
		OFF	
		CH1	
		CH2	
		ADD	
UNIts	MULT		
	REF1		
	REF2		
	REF3		
	REF4		
	CH1Del		
	CH2Del		
	ADDDel		
	MULTDel		
	TIME		BASe PERCent DEGrees
SLOpe		BASe PERCent DB	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
CURS (cont)	REFVolts	VOLts	BASE PERCent DB V VV DiV
		UNIts	
		VALue	<NR3>
	REFSlope	XUNit	SEC CLKs V VV DIV
		YUNit	V VV DIV
		VALue	<NR3>
	REFTime	UNIts	SEC CLKs
		VALue	<NR3>
	NEWref		
	XPOs	ONE	<NR3>
		TWO	<NR3>
	YPOs	ONE	<NR3>
		TWO	<NR3>
	TPOs	ONE	<NR3>
TWO		<NR3>	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Argument	Argument	Argument
MODE	DELTA ABSOLUTE	
DISPlay	VALue UNIts	
SElect	ONE TWO	
<wfm data>		
ENCdg	AScii RPBinary RIBinary RIPartial RPPartial	
TARget	REF1 REF2 REF3 REF4	
SOURce	<data src> ^b	
DSOURce	<data src> ^b	
[ON] OFF		
[ON] OFF		

MULT, REF1, REF2, REF3, REF4, CH1Del,
MULTDel

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
DEVIce	TYPE	THInkjet HPGI	
	SETTIngs	[ON] OFF	
	GRAt	[ON] OFF	
	TEXT	[ON] OFF	
	WAVfrm	[ON] OFF	
	PAGesize	US A4	
DIRection	PLUs MINUs		
DLYEvs	MODE	[ON] OFF	
	VALue	<NR1>	
DLYTime	DELTA	[ON] OFF	
	DLY1	<NR3>	
	DLY2	<NR3>	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
DT	OFF		
	RUN		
	SODRUN		
	STEp		
	"ascii string"		
ERRor?			
EVEnt?			
EXEcute			
EXR	[ON] OFF		
EXTGain	EXT1	DIV1 DIV5	
	EXT2	DIV1 DIV5	
EXW	[ON] OFF		
FASTxmit	<NR1>		
	DELTA	CH1 CH2 BOTH	
	NORmal	CH1 CH2 BOTH	
	OFF		
	ENCdg	RIBinary RPBinary RIPartial RPPartial	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
FORMat	[ON] OFF		
HALt			
HELp?			
HORizontal	MODE	ASweep AINtb BSweep	
	POSition	<NR3>	
	ASEcdiv	<NR3>	
	BSEcdiv	<NR3>	
	EXTExp	<NR1>	
HYSteresis	<NR1>		
ID?			
INIT	PANel GPIb SRQ [BOTH]		
INITAt50			

Header	Argument	Argument	Argument
BTRigger	MODE	RUNSoft TRigaft	
	EXTCLk	[ON] OFF	
	SOUrce	CH1 CH2 WORd VERTical EXT1 EXT2	
	COUpling	AC DC LFRej HFRej NOIserej	
	LEVel	<NR3>	
	SLOpe	PLUs MINUs	
	POSition	<NR1>	
INR	[ON] OFF		
INTENSITY	DISPlay REAdout GRAt INTENS	<NR3> <NR3> <NR3> <NR3>	
	VECTors	[ON] OFF	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
LEVel	<NR1>		
LLPrgm	"ascii string"		
LLSet	<binary block>		
LOCK	ON OFF LLO		
LONG	[ON] OFF		
LOOP	CONt FAIl PASS ONE		
MANtrig			
MAXimum?			
MEASurement	DISPlay	[ON] OFF	
	MARK	[ON] OFF	
	WINDow	[ON] OFF	
	METHod	CURSOr HIStoGram MINMMax	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
MEASurement (cont)	ONE	TYPE	<types> ^a
		SOURce	<data src> ^b
		DSOURce	<data src> ^b
	TWO	TYPE	<types> ^a
		SOURce	<data src> ^b
		DSOURce	<data src> ^b
	THRee	TYPE	<types> ^a
		SOURce	<data src> ^b
		DSOURce	<data src> ^b
	FOUR	TYPE	<types> ^a
		SOURce	<data src> ^b
		DSOURce	<data src> ^b
DISTal	UNIts	PERCent	
		VOLts	
	PLEvel	<NR3>	
MESIal	UNIts	PERCent	
		VOLts	
	PLEvel	<NR3>	
PROXimal	UNIts	PERCent	
		VOLts	
	PLEvel	<NR3>	
	VLEvel	<NR3>	

^aDISTal, PROXimal, MESIal, MINIMUM, MAXimum, MID, TOP, BASE, MEAN, PK2pk, OVERshoot, UNDERshoot, WIDTH, PERIOD, FREquency, DUTy, RISE, FALl, RMS, AREa, DELAy, DMEsial

^bCH1, CH2, ADD, MULT, REF1, REF2, REF3, REF4, CH1Del, CH2Del, ADDDel, MULTDel

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
MEASurement (cont)	DMESial	UNIts PLEvel VLEvel	PERCent VOLts <NR3> <NR3>
MENUoff			
MESSAge	<NR1> CLRstate	"string"	
MINimum?			
NCRoss?			
OPC	[ON] OFF		
PATH	[ON] OFF		
PCRoss?			
PID	[ON] OFF		
PRGm?	"ascii string"	OFF	
PRInt			
PROBe?	CH1 CH2 EXT1 EXT2		
READout	[ON] OFF		

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
REFDisp	REF1 REF2 REF3 REF4	[ON] OFF EMPTY [ON] OFF EMPTY [ON] OFF EMPTY [ON] OFF EMPTY	
REFFrom	REF1 REF2 REF3 REF4 CH1Del CH2Del ADDDel MULTDel CH1 CH2 ADD MULT		
REFPos	REF1 REF2 REF3 REF4 MODE	<NR3> <NR1> <NR1> <NR1> INDEpendent LOCK	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
REM	"ascii string"		
RQS	[ON] OFF		
RUN	[ACQuire] SAVe		
SAVERef	[STACk] REF1 REF2 REF3 REF4		
SET?			
SETUp	SAVe RECall ACTion	ONE TWO THRee FOUr FIVe "ascii string" ONE TWO THRee FOUr FIVe "ascii string" <NR1> where: 1=Repeat 2=Selfcal 4=Selftest 8=Auto Setup 16=Print/Plot 32=Bell 64=SRQ 128=Pause 256=Protect	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
SETUp (cont)	FORCe DELEte MEMory NAMEs CLEar	[ON] OFF "ascii string"	
SETTV	ICOupling NICoupling INTERlaced TVClamp TVLine LCNTReset LCNTStart SYNc	FLD1 FLD2 ALT TVLine FLD1 TVLine [ON] OFF <NR1> F1Only BOTH PREfid ATFid PLUs MINUs	

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
SETWord	RADix	OCT HEX	
	CLOck	ASYnc FAL RISe	
	WORd	<ascii binary data>	
	PROBe		
SMOoth	ON OFF		
SNAP			
STARt	<NR1>		
STEp			
STOp	<NR1>		
TESTNum	<NR1>		
TESTType	SELFCal SElFDIag EXTCAI EXTDIag		
TIME?			

Alphabetical GPIB Command Reference

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
UNIts?	<types> ^a		
USEr	[ON] OFF		
VALue?	<types> ^a		
VAVg?			
VMAximum?			
VMInimum?			
VMODE	CH1	[ON] OFF	
	CH2	[ON] OFF	
	ADD	[ON] OFF	
	MULT	[ON] OFF	
	DISPlay	XY YT	

^aDISTal, PROXimal, MESial, MINimum, MAXimum, MID, TOP, BAsE, MEAN, PK2pk, OVErshoot, UNDErshoot, WIDth, PERiod, FREquency, DUTy, RISe, FALl, RMS, AREa, DELAy, DMEsial

Alphabetical GPIB Command Reference

Event Tables

Alphabetical GPIB Command Reference (cont)

Header	Argument	Argument	Argument
WAVfrm?			
WFMpre	WFId	"ascii string"	
	NR.Pt		
	PT.Fmt	Y	
		ENV	
	XUNit	SEC	
	XINcr	<NR3>	
	PT.Off	<NR1>	
	YUNit	V VV DIV	
	YMUit	<NR3>	
	ENCdg	ASCIi BINary	
	YOff	<NR3>	
	BN.Fmt	RI RP	

Event Tables

Command Error Events

Command Errors are issued when a GPIB "grammatical" error has been made. Check the spelling and structure of the input strings. Set CER to ON to receive SRQ's when any of these events occurs. If CER is OFF, the 2440 will not assert SRQ.

Code	Description
108	Checksum error in CURVE transfers.
109	Count = 0 or EOI set on byte count.
151	Symbol or number too long.
152	Invalid character or control character input.
153	EOI set on back slash.
154	Invalid number input.
155	EOI set on string character before ending quote.
156	Symbol not found.
157	Command or query argument is illegal in this syntax.
158	Character should be a colon.
159	Valid symbol, but not a legal header.
160	Character should be a comma, a semicolon, or EOI.
161	Too many query arguments.
162	Command only. May not be sent as a query.
163	Query only. May not be sent as a command.
164	EOI asserted before waveform was completed.
165	Incorrect word string input.
166	Number expected on incoming ascii waveform.
167	Comma expected on incoming ascii waveform.
168	Incoming ascii waveform has more than 1024 data points.
169	Illegal LLSET string.

Event Tables

Execution Error Events

Execution errors are issued when a particular scope setting doesn't allow the current command to be executed the way the user would like. Set EXR to ON to receive SRQ's when any of these events occurs. If EXR is OFF, the 2440 will not assert SRQ.

Code	Description
203	I/O buffers full, output dumped.
250	Selected recall memory is unset.
251	Measurement requested on an empty reference memory.
252	Waveform requested via GPIB is not valid or available.
253	Too many numbers were sent in (stack overflow).
254	No Video Option installed when SETTV commands issued.
255	Target selected for cursors not displayed.
256	Clear overload condition before changing to 50 Ω coupling.
257	Waveform selected for reference source is not valid.
259	No ADD or MULT on previously SAVED waveforms; ENVELOPE waveform invalid.
260	No cal commands allowed while front panel is doing cal.
261	No sequence by that name to delete.
262	Can't save sequence—out of memory.
263	Can't send a partial waveform to an empty ref.
264	Not enough edges to extract the parameter.
265	Asked for rise time but no rising edge.
266	Asked for fall time but no falling edge.
267	Delay Measurement targets must have matching Sec/Div settings.
268	One or more of the following conditions are not satisfied: BASE<PROXIMAL<MESIAL<DISTAL<TOP, BASE<MESIAL2<TOP, PROXIMAL>MIN and DISTAL<MAX, MIN<MESIAL2<MAX
269	Repet waveform not filled when measurement requested.

Event Tables

Execution Error Events (cont)

Code	Description
270	No measurements during live Roll—enter Save mode first.
271	Measurement requested on a Delta Delay target but B Horizontal and Delta Delay modes are not on.
272	RMS measurement invalid due to 2440 internal overflow.
275	Sequencer currently active—new sequence commands not accepted.

Internal Errors

Internal Errors are issued when something has happened to the hardware of the 2440 that the controller might like to know about. Set INR to ON to receive SRQ's when any of these events occurs. If INR is OFF, the 2440 will not assert SRQ.

Code	Description
330	Cal execute command returns with FAIL.
331	A 50-Ω overload occurred. Input coupling switched to DC.

System Messages

System Messages are issued to inform the controller of bus system management events. There is no way to mask these events except by setting RQS to OFF. The event 459 indicates that the 2440 is currently asserting SRQ on the bus and the controller must read the status byte out before reading the event code.

Code	Description
401	2440 was just powered on.
459	There is an SRQ pending.

Event Tables

User Request Events

User Request events are issued when any of the bezel buttons on the 2440 front panel are pushed. The MENUOFF command needs to be issued before these events will be reported. This command allows the user to monitor front panel responses (as well as to clear the menu for writing custom text to the screen when desired). Set USER to ON to receive SRQ's when any of these events occurs. If USER is OFF, the 2440 will not assert SRQ.

Code	Description
450	Menu key #1 was pushed (leftmost).
451	Menu key #2 was pushed.
452	Menu key #3 was pushed.
453	Menu key #4 was pushed.
454	Menu key #5 was pushed (rightmost).

Probe Identify Events

Probe Identify events are reported by the 2440 when the probe identify feature found on certain probes is actuated. (You can replicate this action by grounding the outer code ring to the inner shell on the front panel input BNC.) Set PID to ON to receive SRQ's when any of these events occurs. If PID is OFF, the 2440 will not assert SRQ.

Code	Description
455	CH1 probe identify was used.
456	CH2 probe identify was used.
457	EXT1 probe identify was used.
458	EXT2 probe identify was used.

Event Tables

Operation Complete Events

Operation Complete events are issued when the controller needs to know when the 2440 has completed a task. Set OPC to ON to receive SRQ's when any of these events occurs. If OPC is OFF, the 2440 will not assert SRQ.

Code	Description
461	Single Sequence has completed.
462	Save-On-Delta has detected a difference and gone to Save.
463	A print or plot is complete.
464	Current cal command started with an EXECUTE is done.
465	Step command is done.
466	Complete sequence is done.
467	Autoset search is complete.

Execution Warning

Execution Warnings are issued when the command received has been done, but the result might not be what the user expected to see. Set EXW to ON to receive SRQ's when any of these events occurs. If EXW is OFF, the 2440 will not assert SRQ.

Code	Description
539	50 MHz bandwidth limit not available in 2440. Bandwidth limit set to 100 MHz.
540	RMS measurements need at least 1 period.
541	Amplitude too small to do an accurate timing measurement.
542	Measurement crossing points on Envelope may be misplaced. Turn on Marks to see where measurement was taken.
543	Too few points acquired to guarantee Histogram accuracy for this measurement.

Event Tables

Execution Warning (cont)

Code	Description
544	Waveform has points off the top of vertical window.
545	Waveform has points off the bottom of vertical window.
546	Waveform has points off the top and bottom of vertical window.
547	Rising/Falling edge has too few points for optimal accuracy.
548	Min/Max method should not be used for Overshoot/Undershoot measurements.
549	Not enough samples taken to do accurate Time, Freq, Period, Pulse Width, or Delay measurement. Set Sec/Div faster if possible.
550	Only Delay 1 will be displayed if in Average.
551	Word Recognizer Probe is disconnected.
552	A and B Sec/Div are locked together.
553	More than 1024 binary points were sent; excess discarded.
554	No absolute cursors in slope.
555	A trigger coupling and logsrc changed.
556	A trigger source change forced logsrc to off.
557	No Average in Roll. Acquire mode or A Trigger mode changed.
558	No live vertical expansion unless averaging. Gain changed.
560	Volts/Div value requested was rounded or limited.
561	Variable Volts/Div value requested was limited.
562	Vertical Position value requested was limited.
563	A or B trigger level was limited.
564	Trigger Holdoff value requested was limited.
565	Horizontal Position value requested was limited.
566	A or B Sec/Div setting requested was rounded.
567	Delay by Events events number was limited.
568	Delay by Time Delay value was limited.
569	Number of Envelopes requested was rounded.
570	Number of Averages requested was rounded.
572	Cursor reference value requested was rounded.

Event Tables

Command Error Events

Code	Description
573	Horizontal position value (XPOS) for cursors was limited.
574	Vertical position value (YPOS) for cursors was limited.
575	Intensity value requested was limited.
576	Line number of screen text message was limited.
578	The XINCR value was rounded or limited.
579	The PTOFF value was rounded or limited.
580	The YMULT value was rounded or limited.
582	Trigger position number requested was limited.
583	An ascii data point was rounded to fit into 127 to -128.
584	Waveform data level value requested was limited.
585	Start or Stop number was changed.
586	The YOFF value was limited.
587	Extexp value requested was limited.
588	Hysteresis number requested was rounded.
589	Attribute number requested was rounded.

Device Dependent Message

Device Dependent messages are issued when the front panel user of the 2440 has done something that the controller might want to know about. Set DEVDEP to ON to receive SRQ's when any of these events occurs. If DEVDEP is OFF, the 2440 will not assert SRQ.

Code	Description
650	Waveform was requested from front panel.
651	Waveform transmission was aborted from front panel.
652	MENUOFF command was executed or front panel button pushed.

Fatal Error

A Fatal Error is issued when something completely unexpected happens inside the 2440. This normally is caused by a hardware failure. There is no way to prevent this error from being reported except by turning RQS to OFF.

Code	Description
750	Fatal error.

2440 Status Bytes

On the following two pages is the 2440 Status Byte table. It lists each status byte code, along with the instrument status indicated by each code, that can be returned when the EVEnts query is sent by the controller.

2440 Status Bytes

Title	Binary ^a	Decimal				Priority	
		RQS Off		RQS On		RQS Off	RQS On
		Idle	Busy	Idle	Busy		
No Status To Report	000X 0000	0	16	0	16	2	1
Power On	010X 0001	1	17	65	81	2	9
Operation Complete	0R0X 0010	2	18	66	82	2	3
User Request	0R0X 0011	3	19	67	83	2	8
Command Error	0R1X 0001	33	49	97	113	2	7
Execution Error	0R1X 0010	34	50	98	114	2	6
Internal Error	0R1X 0011	35	51	99	115	2	5
Execution Warning	0R1X 0101	37	53	101	117	2	4

Transmit Request	1R0X 0011	131	147	195	211	2	8
Transmit Aborted	1R0X 0100	132	148	196	212	2	8
Menuoff Pushed	1R0X 0101	133	149	197	213	2	8
Fatal Error	1R1X 0011	---	---	227	243	--	10

Device Dependent Bit
 RQS Bit
 Error Bit
 Busy Bit

^a“r” is set to 1 if the GPIB and RQS are on; otherwise, it is 0.

^b“X” is the Busy Bit and will be set if the 2440 is busy at the time the status byte is read. Any time the 2440 is doing something for which the OPC SRQ can be sent (calibration or self test, single sequence, Save-On-Delta, or plotting) the bit will be sent true (1); otherwise, it will be a 0.

Character Charts

ASCII and 2440 Character Charts

BITS		SPECIAL		NUMBERS SYMBOLS		UPPER CASE		UNDERLINED	
B7	B6	B5	B4	B3	B2	B1	B0	B7	B6
0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0
0	0	0	1	1	0	0	0	0	0
0	0	0	1	1	1	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	0	1	0	0	1	0	0	0	0
0	0	1	0	1	0	0	0	0	0
0	0	1	0	1	1	0	0	0	0
0	1	0	0	0	0	0	0	0	0
0	1	0	0	0	1	0	0	0	0
0	1	0	0	1	0	0	0	0	0
0	1	0	0	1	1	0	0	0	0
0	1	1	0	0	0	0	0	0	0
0	1	1	0	0	1	0	0	0	0
0	1	1	0	1	0	0	0	0	0
0	1	1	0	1	1	0	0	0	0
0	1	1	1	0	0	0	0	0	0
0	1	1	1	0	1	0	0	0	0
0	1	1	1	1	0	0	0	0	0
0	1	1	1	1	1	0	0	0	0
1	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0	0	0
1	0	0	0	1	0	0	0	0	0
1	0	0	0	1	1	0	0	0	0
1	0	0	1	0	0	0	0	0	0
1	0	0	1	0	1	0	0	0	0
1	0	0	1	1	0	0	0	0	0
1	0	0	1	1	1	0	0	0	0
1	0	1	0	0	0	0	0	0	0
1	0	1	0	0	1	0	0	0	0
1	0	1	0	1	0	0	0	0	0
1	0	1	0	1	1	0	0	0	0
1	0	1	1	0	0	0	0	0	0
1	0	1	1	0	1	0	0	0	0
1	0	1	1	1	0	0	0	0	0
1	0	1	1	1	1	0	0	0	0
1	1	0	0	0	0	0	0	0	0
1	1	0	0	0	1	0	0	0	0
1	1	0	0	1	0	0	0	0	0
1	1	0	0	1	1	0	0	0	0
1	1	0	1	0	0	0	0	0	0
1	1	0	1	0	1	0	0	0	0
1	1	0	1	1	0	0	0	0	0
1	1	0	1	1	1	0	0	0	0
1	1	1	0	0	0	0	0	0	0
1	1	1	0	0	1	0	0	0	0
1	1	1	0	1	0	0	0	0	0
1	1	1	0	1	1	0	0	0	0
1	1	1	1	0	0	0	0	0	0
1	1	1	1	0	1	0	0	0	0
1	1	1	1	1	0	0	0	0	0
1	1	1	1	1	1	0	0	0	0

* DEL = RUBOUT

KEY TO CHART

octal — 32 — GPIB code

hex — 1A — 2430 character

26 — decimal

(4818-35) 6338-03

Character Charts

ASCII & GPIB CODE CHART

ASCII & GPIB CODE CHART

BITS		B7 B6 B5		B4 B3 B2 B1		CONTROL		NUMBERS SYMBOLS		UPPER CASE		LOWER CASE	
B7	B6	B5	B4	B3	B2	B1							
0	0	0	0	0	0	0	NUL	DLE	SP	0	@	P	
0	0	0	0	1	0	0	SOH	DC1	!	1	A	Q	a
0	0	0	1	0	0	0	STX	DC2	"	2	B	R	b
0	0	0	1	1	0	0	ETX	DC3	#	3	C	S	c
0	0	1	0	0	0	0	EOT	DC4	\$	4	D	T	d
0	0	1	0	1	0	0	ENQ	NAK	%	5	E	U	e
0	0	1	1	0	0	0	ACK	SYN	&	6	F	V	v
0	0	1	1	1	0	0	BEL	ETB	'	7	G	W	w
0	1	0	0	0	0	0	BS	CAN	(	8	H	X	h
0	1	0	0	1	0	0	HT	EM	)	9	I	Y	y
0	1	0	1	0	0	0	LF	SUB	*	10	J	Z	j
0	1	0	1	1	0	0	VT	ESC	+	11	K	[	k
0	1	1	0	0	0	0	FF	FS	,	12	L	]	l
0	1	1	0	1	0	0	CR	GS	-	13	M	^	m
0	1	1	1	0	0	0	SO	RS	.	14	N	_	n
0	1	1	1	1	0	0	SI	US	/	15	O	~	o
ADDRESS		UNIVERSAL		LISTEN		TALK		SECONDARY		ADDRESSES		ADDRESSES	
COMMANDS		COMMANDS		ADDRESSES		ADDRESSES		OR COMMANDS					

KEY

octal	25	PPU	GPIB code
hex	15	NAK	ASCII character
		21	decimal

Tektronix
COMMITTED TO EXCELLENCE

REF: ANSI STD X3.4-1977
IEEE STD 488-1978
ISO STD 646-1973

TEKTRONIX STD 048-5405-00 4 SEP 80
COPYRIGHT © 1979, 1980 TEKTRONIX, INC. ALL RIGHTS RESERVED

6338-04