CREG 13*	Defines start corner for PIXMOV: desti- nation window.	Default Port Configura Port Mnemonic RTS CTS	
CREG 14*	Controls direction of pixel writing for	MODEMSIO off off	
oned th	PIXMOV destination window.	KEYBSIO off off	
CREG 15*†	Screen origin of overlay plane 0.	TABLETSIO off off	
CREG 16*†	Screen origin of overlay plane 1.	GRINSIO off off HOSTSIO off off	
CREG 17-19	Reserved for future definition.	ALPHASIO off off	
CREG 20-63	Unassigned. Available for temporary		
Oned to be	coordinate storage.	Alphanumeric Termina	
*Option Card Users Only	coordinate storage.	ALPHEM** flag	
+Model One/20 and Model Or	ne/25 Users Only	ALTIENT hay	
Value Register Assignme	nts		
VREG 0 Current Value	The value used in all graphics primi-		
	tives commands.	BOLD** flag	
VREG 1	Value used for crosshair 0.		
VREG 2	Value used for crosshair 1.	DEFWIN** window , x1,	
VREG 3	Fill Mask used for Area fills.	y1, x2, y2, x-size, y-size,	
VREG 4*1	Color assignment for overlay plane 0.	bitm, bankm	
VREG 5*1	Color assignment for overlay plane 1.		
VREG 6	For future definition.		
VREG 7-15	Available for temporary value storage.		
VREG 16, 1940**	Foreground color, alphanumeric windows	DELWIN** window	
	0-8.	DIRCUR** x,y	
VREG 17, 2041**	Background color, alphanumeric windows		
VILC 17, 2041	0-8.	GETCUR**	
VREG 18, 2142**	Cursor color, alphanumeric windows 0-8.		
VREG 43-50	For future definition.	GETPOS**	
VREG 51-63		all oc	
	Available for temporary value storage.	GETWIN**	
*Option Card Users Only			
+Model One/20 and Model Or **Advanced Graphics Develop	HOME**		
System Configuration C	ommands ++	MOVCUR** x,y	
DFTCFG	Restore all ports to default configurations.		
DISCFG	Display current system configurations.	OVRSTK** flag	
SAVCFG	Save configuration set with SYSCFG.	, i i i i i i i i i i i i i i i i i i i	
SYSCFG HOST	Mode [ASCII/BINARY]	SCROLL** flag	
SYSCFG IEEE			
SYSCEG SERIAL	[address] [NORMAL] [TALK] [LISTEN]	SELWIN** window	
STOURG SERIAL	[Port-mnemonic] [RTS on/off] [CTS on/off]		
	[STOP 1/2] [BITS 7/8] [PARITY e/o/1/h/n]	SETCUR** flag	
	[BAUD rate] [XIN on/off] [XOUT on/off]	dereent hag	
SYSCEG SERIAL	[CTRL on/off] TABLET [GTCO/SUMMA].	SETSIZ** xscale, vscale	
STOOL G SENIAL	TABLET [GTCO/SOMMAJ.		
Advanced Graphics Develop	pment Firmware	WRAP flag	
		**Advanced Graphics Develop	

irations	Display List Firmwaret
off 300 none on off on 1 i off 1200 none on off 2 i off 1200 off off 2 i off 1200 none off off 0 i off 2 i off 9600 none off off 0 off 2 i off 9600 none off off 0 off 2 i off 9600 none off off 0 off 2 i off 0 off 2 i	
inal Emulation**	
Enables (flag=1 or ON) or disables (flag=0 or OFF) the alphanumeric term	inal
emulator. Routes text to selected window	
[C2 _H]	
Enables (flag=1 or ON) or disables	DELPID
(flag=0 or OFF) drawing to bold text. [C0 1, Defines size and positions of indicated	HILITE view, flag, vreg
ze, window number. (x1,y1) defines first corr	ner;
(x2,y2) defines diagonal corner. x-size,	
y-size define text size; bitm, bankm defin write mask for window (see WRMASK co	
mand). [CO _µ]	PICKCR view, dcsreg,
Deletes window. [C3 _H]	searchflag
Moves cursor to character position x,y	
within window. [C4 _H]	· · · · · · · · · · · · · · · · · · ·
Returns Model One coordinates of cur	sor RDPID
in currently-selected window. [C9 _H]	
Returns character position of cursor in	
currently-selected window. [C5 _H]	RDREG
Returns number of active window (-1 for active window). [CE _H]	no
Moves cursor to character position (0,0),	RDTREE
the upper-left corner of the window. $[CF_{H}]$	1
Moves cursor to Model One coordinate	- REDRAW VIEW, IIAO
within window limits. [C8 _H]	
Enables (flag=1 or ON) or disables	
(flag=0 or OFF) overstriking of text. [CD _H	SEGAPP segment
Enables (flag=1 or ON) or disables	
(flag=0 or OFF) scrolling of text.	
Select window as defined by DEFWIN. S routing for ALPHEM command. [C1 _H]	SEGCOP segment2,
Enables (flag=1 or ON) or disables	segment1
$(flag=0 \text{ or OFF})$ cursor. $[C7_H]$	SEGDEF segment
Sets x,y scaling (multiples of 16 pixels).	SEGDEL segment SEGEND
Default is (1,1). [C6 _H]	SEGEND
Enables (flag=1 or ON) or disables	SEGINI words
(flag=0 or OFF) wraparound of text. [CB _H	
elopment Firmware	SEGINQ segments
	SEGING Segments

ist Firmware^{††} ew. wcsrea1.

System. view gives the view number; wcsreg1 and wcsreg2 define the WCS uprea1, uprea2, orm, backvreg, corners; dcsreg1 and dcsreg2 define the display viewport; upreg1 and upreg2 give the ends of the UP vector; rotate defines the WCS window rotation center: xform specifies the transformation type: backvreg gives the ackground color; for bitm and bankm, see the WRMASK command; hiseg specifies the segment nesting. [EB_µ] Delete primitives with PIDREG and SEGREG. [EC_H] Highlight view in the color specified by vreg. flag = 1 or ON highlights primitives; flag = 0 or OFF draws primitives normally. PIDREG and SEGREG (see SET) are used. [DF_] Perform pick search; view is picked, using the dcsreg coordinates. searchflag = 1 or ON, search from current tree location; searchflag = 0 or OFF, search from the top of the segment. [E3, 1] Reads and returns the graphics primitives with PIDREG and SEGREG (see SET). [ED_{LI}] Reads and returns the current SEGREG and PIDREG (see SET and PICKCR). [EO, 1] Returns the PICKCR hierarchical history. [EE_H] Redisplay view: flag = 1 or ON clears the window to the background color before display. view = -1 redisplays all views. [E2_H] Open segment to append graphics primitive commands. SEGEND ends the append. [DB,] Copies segment1 into segment2. [EA,] Begins definition of segment. [DC_µ] Deletes segment. [DE_H] End segment definition begun with SEGDEF or SEGAPP. [DDu]. Initializes Display List Firmware: words gives the number of data words per segment block. [E1_] Returns the attributes of segment. See SETATR). [E5_H]

Defines the view into the World Coordinate

SEGPID pickid	Defines the pickid for primitives wit ment until next SEGPID or SEGEN mand. [D9 _H]
SEGREF segment	Nest specified segment within curr ment. [D8 _H]
SEGREN segment2, segment1	Renames segment1 to segment2.
SET global,value	Set PICKAP aperture; set PIDREG set SEGREG value. [46 _µ]
SETATR segment, attribute, flag	Sets VISibility or PICKability of seguinary flag = 1 or ON enables attribute (VI PICK); flag = 0 or OFF disables attribute [E6 _µ]
SYSTAT	Returns system memory usage an availability. [E4 _µ]
††Optional Firmware for Model C	Dne/25, Model One/40, and Model One/60

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ithin seq-ND com-

rrent seg-

[DA_H]

G value:

ament. /IS or tribute.

nd

Raster Technologies

MODEL ONE **Programming Reference Card**

The following summary of the graphics commands supported by the standard firmware in the Model One product family. Brackets [] indicate the hexadecimal opcode of each command.

HELP HELP mnemonic List all command mnemonics. Give command information.

Graphics Primitives ARC rad, a1, a2

AREA1

AREA2 vrea

CIRCI creq

CIRCLE rad CIRCXY x, y

CLEAR

DRW2R dx. dv DRW3R dx, dy DRWABS x, y

DRWI creq

DRWREL dx, dy FILMSK rmsk, gmsk, bmsk

FLOOD

MOV2R dx, dy MOV3R dx, dy MOVABS x, y

MOVI creg

MOVREL dx, dy POINT

Draw arc of radius rad. Starting angle is a1; ending angle is a2. [11_H] Area fill. Boundary is any pixel different in value from the current point. The area is filled with current value. $[13_{\mu}]$ Area fill. Boundary pixel value given in vreg. [14] Draw circle. Location given by creg lies on the circumference. [10_H] Draw a circle of radius rad. [0EL] Draw circle, Point x, y lies on the circumference. [0F_H] Flood current window to current pixel value, [87] Draw vector relative by dx, dy, [84,] Draw vector relative by dx, dy. [83_H] Draw vector from current point to the point x, y. [81_µ] Draw vector to location given by creg. [854] Draw vector relative by dx, dy. [82_H] Image data is ANDed with mask before checking value in AREA fill commands. [9F_H] Flood displayed image memory to current pixel value. [07] Move relative by dx, dy. [04] Move relative by dx, dy. [03] Move absolute location of current point to x, y. [01_µ] Move to location given by coordinate register creg. [05.] Move relative by dx, dy. [02_H] Set current point to current pixel value. [88_H]

program r, g, b, ort value or g, b, brotzontal count is cnt. [2A,] VGWAIT frames to mask [2E,]] per ling raphics mode. [9] pRMFIL flag Primet of vertices and the vertices. [13,] MUNLNB moves, ncols, val. val. Horizontal count is cnt. [2A,] VGWAIT frames to mask [2E,]] per ling raphics mode. [9] PRMFIL flag Primet fill agrint. If flag-1. If flag-1. flag-0.								
PARTEL Top PRATEL Top PRATE Top PRA	POLYGN npoly, verts				VECPAT mask		READCR creg	Read coordinate register. Sen
PARE[1, 10] Product in Figure products and one product in Figure Product Product in Figure Product Product in Figure Product Pro			r, g, b, cht	-				
Partial: Lag Primality etil: Flind p					VGWAIT frames		READER	
witch integration witch integration witch integration witch integration witch	DDMEU flog				WAIT frames	1		11-
Bitchey Detection Displey Control Displey	PRMFIL hag		val, chi	val, val. Horizontal count is cht. [2B _H]	WATT Hames	0	READF func	Sets pixel readback format. Fu
RECK R. or, w dy say from correst got, Rager 1 and the state in filter 1 (figs 1, figs 1,			Display Control			C C		
No. 200 Accur Higs1,				Sets host port input as free format	14/4 014		READP	Read Pixel. Send value of pixe
BECKIN x y bioservices Dearworking End x y section diagonal correr (Big), diagonal corerer (Big), diagonal	RECREL dx, dy		, loon nag		WARM			in graphics mode. [95 _H]
RECT cmg magorial correr (8), (1) BLANK flag Burkas sceam when flag-1, month whom flag-0 [31, 2) MARK flag	PEOTAN	· · · · · · · · · · · · · · · · · · ·					READVR vreg	Read value register. Send pixe
BECD range Draw restringts Control of the methods Mode of the methods	RECTAN X, Y		BLANK flag		WINDOW X1, y1, X2, y2			port in graphics mode. [99 _H]
TextTo large is diagonal convert [97,1]CLOCollatar. Rest the Mode (0, eff.0), Loda contrained entity entity in the ULT [97,1]Call Collatar. Rest the Mode (0, eff.0), Loda contrained entity engitser (1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	DECT	- 11-	BE, it it may	•	WELLACK hitm hankm		READW nrows, ncols, bf	Read Window. Send value of
Text atriageDraw feat staring with fort $1, [0, 1]$ CORING x, yLobas coordinate origin register with x, y, [3, 1]Draw feat staring with fort $1, [0, 1]$ Draw feat	RECTICreg		COLD	II-	WRMASK DILM, Dankm		1	window to port in graphics me
TEXTC samp properties Draw bast string with ford 2 [91,] mage many [92,] FRSTP Has properties FRSTP Has properies FRSTP Has properties FRSTP	TENTA						READWE nrows, ncols,	Read Window run-length enco
TEXT beam Specify size of stand draw at angle and group	0		oonona x, y			- 11-	bf	Send values of pixels in windo
TexTDC holdragangl [22,]TexTDC holdragangl [22,]angl [22,]angl [22,]angl [22,]angl [22,]TexTDC holdragReside default character set. [31,]Select diftagr0. (16, 12, 12, 64, 8)Select diftagr0. (16, 12, 12, 64, 8)Select diftagr0. (16, 12, 12, 64, 8)Registr OpenionsVALE K valSelect output diam node is selectedIf fagr1. [12, 6],Select output diam node is selectedIf fagr1. [26, 1]Com thy factor of 16, 12, 24, or 8.Registr OpenionsVALE K valSelect output diam node is selectedIf fagr1. [26, 1]Select output diam node is selectedIf fagr1. [26, 1]Com thy factor of 2, [35, 1]COM Carl Line CompVALE K valSelect output diam node is selectedIf fagr1. [26, 1]Select output diam node is selectedIf fagr1. [26, 1]Com thy factor of 16, 12, 24 or 8.Registr OpenionsVALE K valSelect node node base base for the selectedIf fagr1. [26, 1]MODE IX factor of 16, 12, 24 or 8.Registr OpenionsVALE K valSelect node node base base for the selectedIf fagr1. [26, 1]MODE IX factor of 16, 12, 24 or 8.Registr OpenionsVALE K valSelect node node hase base for the selectedIf fagr1. [26, 1]MODE IX factor of 16, 12, 24 or 8.Registr OpenionsVALE K valSelect node node hase base for the selectedIf fagr1. [26, 1]MODE IX factor of 16, 12, 24 or 8.Registr OpenionsVALE K valSelect node node hase base for the selectedIf fagr1. [26, 1]MODE IX factor of 16, 12, 24 or 8.Registr OpenionsVIE K V select has selected is in fagr1. [26, 1]<		C 11.	FIRSTP flag		XHAIR num, flag			length encloded form to port in
TEXT De char, weigst Define downloaded character in fort 2, B,	TEXTC size, ang		THIST hag			0		phics mode. [97 _H]
Text/ReRestorm deal $[2g_{+1}]$ Restorm dealRestorm deal $[2g_{+1}]$ Restorm dealRestorm deal $[2g_{+1}]$ Restorm dealRestorm dealRestorm deal $[2g_{+1}]$ Restorm dealRestorm deal <td></td> <td></td> <td>MODDIS flag</td> <td></td> <td></td> <td></td> <td></td> <td></td>			MODDIS flag					
TEXTRE Reside default character set, [B1,] VAL IK val Set current pixel value for X mode), [B0,] MODELK (unct Set care of table value for X mode), [B0,] CALL State, 180,1 Care of table value for X mode), [B0,] CALL State, 180,1 Care of table value for X mode), [B0,] CALL State, 180,1 Care of table value for X mode), [B0,] Care of table value for X, 180,1 <t< td=""><td>TEXION char, vecist</td><td></td><td>MODDIS hag</td><td></td><td>ZOOM fact</td><td>and the second sec</td><td></td><td></td></t<>	TEXION char, vecist		MODDIS hag		ZOOM fact	and the second sec		
VALUK val Set current pixel value (for 1K mode), [Bq,] MODELK funct Select output (fait an outing in 1K mode), [Bq,] CLOAD creg x, y CLOA				-			CADD csum, creg	Place result of csum+creg in c
Link full EDD_1 Cold Darks function EDD_1 Cold Darks function EDD_1 VALUE vial Set current pixel value to val, val, val, edd Set Dist on the pace field overlap plane when flag=1. EDD_1 Set Dist on the pace field overlap plane when flag=1. Cold Darks function Set Dist on the pace field overlap plane when flag=1. Set Dist on the pace field overlap plane when flag=1. Set Dist on the pace field overlap plane when flag=1. Set Dist on the pace field overlap plane when flag=1. SetDist on			MODE1K funct			Zoom in by factor of 2. [35 _H]		[A2 _H]
VALU at i Set Current pixel value to val, val, val, val, is per current pixel value to val, val, val, val, val, val, val, val,	VAL1K val		WODETRTUIC				CLOAD creg x, y	Load coordinate register creg
WALUE r, b. Sectorment pixel value to r, g. b. (BA, j) Special characters (Default Values) CMUVE costs, radius CMUE			OVPRD*+ plana flag		†Model One/20 and Model On	19/25 Users Univ		[A0 _H]
View Set Current pixel value to r, g, b Set Current pixel value to r, g, b Set Current pixel value to r, g, b Set bits to 1 in specified verting value to r, g, b ASCII Code Char Purpose Count data string Count data string Count data string Purpose Count data string Count data st	VAL8 val	and the second sec	OVAND platle, hag		Special Characters (Defa	ult Values)	CMOVE cdst, csrc	Move contents of csrc into cds
VTEXT string Vertical text string with fort 1, 19, 6, 10, 10, -11 OVRVAL*t plane, flag Deschifts to 1 in specified overlay plane when flag ⁻¹ , reset bits to 0 when flag ⁻¹ , reset bits to 0 w					ASCII Code Char	Purpose	CSUB cdif, creg	Place result of cdif-creg in cdi
VTEXT string Vertical text string with fort 1, [54,] OVRVE 1 plane, flag on tage 1, reset bits to 0 when grade 1, ges 0, grade 1, grade			OV(D)(A) *+ plana flag		10		VADD vsum, vreg	Place result of vsum+ vreg into
Lock Up factor Make entry r. g. b Make entry r. g. b at location given in index. [16,] OVR2M*† plane, flag Display plane at scale factor 1:1 if ESC or CTL 2 Warmstart VLOD UP gr, r. g. b With r. g. b. LUTB index, r. g. b Make entry r. g. b at location given in index. [16,] Display plane at scale factor 1:1 if mage memory if flag-1 Backspace VMOVE vdit, reg With veg LUTB index, entry Make entry in all LUT. Place entry at location given in index. [16,] PIXCLP flag PixeU processor clipping status. Clip on virundefilow flag-1, [30,-] CTL & 6 NACK Software Development LUTB index, entry Make entry in Bel LUT. Place entry at location given in index. [16,] PIXCLP flag PixeU processor rode: redits, green and blue bars, [Br,] PixeU processor rode: redits, green and blue bars, [Br,] PixeU processor rode: redits, green and blue bars, [Br,] Software Development A_PHAO strien, string Software Development LUTB index, entry Make entry in Red LUT. Place entry at location given in index. [16,] PixeU processor mode: redits, green, and blue bars, [Br,] PixeU processor mode: redits, green, and blue bars, [Br,] PixeU processor mode: redits, green, and blue bars, [Br,] PixeU processor mode: redits, green, and blue bars, [Br,] PixeU processor mode: redits, green, and blue bars, [Br,] PixeU processor mode: redits, green, and blue bars, [Br,] PixeU processor mode: redits, green, and blue bars, [Br,] PixeU processor mode: redi		• • •	OVRVAL plane, hag		CTLP 1	Break		[A6 _H]
Lock-Up Table Commands OVRZM*† plane, flag Display plane at scale factor 1:1 if flag-0, display at same scale factor 1:1 if flag-0, display at	VIEX12 string	Vertical text string with font 2. [94 _H]			ESC or CTL[2	Warmstart	VLOAD vreg, r, g, b	Load contents of value registe
LUT8 index, r, g, b Make entry r, g, b Make ent	Look-Up Table Command	ds	OVPZM*t plano flag		@ 3	Line Kill		
index in Red, Green, and Blue LUTs. image memory if flag-1, [Bg,], [ICq,] CTL F 5 ACK VSUB vdi, veg Place result of vdi-veg in program comment [80,,] LUTA index, entry Make entry in all LUTs. Place entry at location given in index, [18,,] PIXEUP flag Pixel processor mode, All vectors and DPMA writes are affected, 184,,] CTL V 6 ACK VSUB vdi, veg Place result of vdi-veg in display, [36,,] LUTB index, entry Make entry in lindex, [18,,] PIXEUN mode Set pixel processor mode, All vectors and DPMA writes are affected, 184,,] PIXEUN mode Set pixel processor mode, all vectors and DPMA writes are affected, 184,,] CTL Q 9 Resume Communications ALPHAO strien, string Set dis verify <td></td> <td></td> <td>OVIZINI plane, hag</td> <td></td> <td>CTLH 4</td> <td>Backspace</td> <td></td> <td>Move contents of vsrc into vds</td>			OVIZINI plane, hag		CTLH 4	Backspace		Move contents of vsrc into vds
ICL_II PIXCLP flag PixcLP fl	2010 mack, 1, g, b				CTLF 5	ACK	VSUB vdif, vreg	Place result of vdif-vreg into v
LUTA index, entry boation given in index. [14,1] LUTB index, entry Make entry in Blue LUT. Place entry at location given in index. [14,1] LUTG index, entry at location given in index. [14,1] LUTB index, entry Make entry in Green LUT. Place entry at location given in index. [14,1] LUTB index, entry Make entry in Green LUT. Place entry at location given in index. [14,1] LUTB index, entry Make entry in Bue LUT. Place entry at location given in index. [14,1] LUTB index, entry Make entry in Green LUT. Place entry at location given in index. [14,1] LUTB index, entry Make entry in Red LUT. Place entry at location given in index. [14,1] LUTB index, entry Make entry in Red LUT. Place entry at location given in index. [14,1] LUTB index, entry Make entry in Red LUT. Place entry at location given in index. [14,1] LUTB index, entry Make entry in Red LUT. Place entry at location given in index. [14,1] LUTB index, entryPMCTL* 0 0 0 Set pixel mover marker. Black entry at black entry in Red LUT. Place entry at at location given in index. [14,1] LUTB index, entryPMCTL* 0 0 0 Set pixel mover marker. Black entry in Red LUT. Place entry at entry in Red LUT. Place entry at index entry in Red LUT. Place entry at location given in index. [14,1] LUTB index, entryPMCTL* 0 0 0 Set pixel mover marker. Black entry in Red LUT. Place entry at entry in Red			PIXCI P flag		CTLU 6	NACK	Cottours Development	
InstructionInclusionInstructionPixe	LUTA index entry		TROET hag		CTLX 7	Invoke Debug	Software Development	Description a second (80.1
LUTB index, entry Make entry in Blue LUT. Place entry at location given in index. [1A ₊₁] PIXMOV* and DPMA writes are affected. [3B ₊₁] CTL Q 9 Resume Communications AET index attring Display control LUTG index, entry Make entry in Green LUT. Place entry at location given in index. [1A ₊₁] PIXMOV* Initiate pixel mover transfer. Move window specified by CREG 11 and 12 as controlled by CREG 11 and 14. [BB ₊₁] Empty Buffers Empty Buffers Enter Graphics Mode Call EMPTB Enter Graphics Mode Call EMPTB Enter Graphics Mode DELAY factor Delay transmission of ch LUTR index, entry Make entry in Red LUT. Place entry at location given in index. [1B ₊₁] PXCL* 0 0 0 0 Set pixel mover mode; redrte, greennte, bluere Set pixel mover mode; redrte, greennte, and blue banks. [BF ₊₁] Enter Graphics Mode Call EMPTB Enter Graphics Mode DALAD Download 28002 Object. LUTR the dut of one 20 and Model One/20 a			PIXELIN mode		CTLS 8	Suspend Communications		
Instrument of the section given in index. [14,i] PIXMOV* Initiate pixel mover transfer tow window specified by CREG 11 and 12 as controlled by CREG 11 and 12 as controlled by CREG 13 and 14 (BB,i) FORTRAN Utility Subroutines Empty Buffers DEBUG flag Empty Buffers LUTR index, entry Make entry in Red LUT. Place entry at location given in index. [18,i] PMCTL* 0 0 0 Set pixel mover mode; redrte, greente, and bluerte control writing into the redre, greente, bluete Set pixel mover mode; redrte, greente, and blue banks. [BF,i] Empty Buffers DELAY factor DeLay factor Delay transmission of call BMDTV turm TFF func Change LUT routing function specified by func. [1E,i] QUIT Exit graphics mode. [FF,i] Set Read Mask. All pixel values read for minage are ANDed with mask. [9E,i] PMCTL* 0 0 or mage are ANDed with mask. [9E,i] Set Set Read Mask. All pixel values read for minage are and bluet reding register to xy [36,i] Redback Commands require a 7t readback mode to ASCII decimal (flag = OFF or 0) or binary (flag = ON or 1). [D3,i] NULL No coparation (00,i) timage Transmissions Pixel by pixel image definition. Pixel values are val, val, val. [29,i] ScRORG x, y Set screen origin register to xy [36,i] Redefine special characters fee secons (secons special characters fee secons special charact	LUTB index. entry	• 11-	FIXE ON HODE		CTLQ 9	Resume Communications	ALPHAO sthen, string	-
LUTG index, entry Make entry in Green LUT. Place entry at location given in index. [19,] dow specified by CREG 11 and 12 as controlled by CREG 13 and 14. [BB,] CONTRAM Onling Subdumes Controlled by Buffers DELAY factor Delay transmission of ch ontolled by CREG 13 and 14. [BB,] LUTR index, entry Make entry in Red LUT. Place entry at location given in index. [18,] PMCTL* 0 0 0 Set pixel mover mode; redite, greente, and blue banks. [BF,] Set pixel mover mode; redite, greente, and blue banks. [BF,] PMCTL* 0 0 0 Set pixel mover mode; redite, greente, and blue banks. [BF,] Send one byte to output buffer. Call SEND1 (val) DELAY factor Delay transmission of ch ommal at ext string to the red, green, and blue banks. [BF,] LUTR Media One/20 and Model One/20 and Model One/25 Users Only OUIT Exit graphics mode. [FF,] Image Transmissions Exit graphics mode. [FF,] Image Transmissions RDMASK mask Set Set Read Mask. All pixel values are val, val, val. (29,1) No operation. [00,1] NULL No operation. [00,1] PIXELS nrows, ncols, r, g, b Pixel by pixel image definition. Pixel values are val, val, val. (29,1) Set Ket M flag Invoke Tektronix kernulator. [39,1] Redefine special characters (see values are val, val, val. (29,1) POKE addr, data Change contents of addr memory. [BE,1] PIXELS nrows, ncols, r, g, b Pixel by pixel image definition. Pixel values are val, val, val. (29,1) TEKEM flag Invoke Tekt			PIXMOV*					
at location given in index. [19µ] Make entry in Red LUT. Place entry at location given in index. [19µ] Controlled by CREG 13 and 14. [B4µ] Call EMPTYB Enter Graphics Mode DELAY factor Delay transmission of ch LUTRMP code, sind, eind, sent, ent Locat LUTs with ramp function [1Dµ] PMCTL* 0 0 0 0 Set pixel mover mode; redrte, greente, and blue banks. [BFµ] Set pixel mover mode; redrte, greente, and blue banks. [BFµ] Call EMPTYB Enter Graphics Mode DELAY factor Delay transmission of ch eind, sent, ent Cult Tr outing function specified by func. [1Eµ] OUIT Exit graphics mode. [FFµ] Set Read Mask. All pixel values read from image are ANDed with mask. [9Eµ] All Read commands require a 7-bit ASCII ACK. HoSTO strien, string Set at at st string to the I Model One/20 and Model One/25 Users Only SCRORG x, y Set Read Mask. All pixel values read from image are ANDe dwith mask. [9Eµ] Redfine special characters (see special characters (see special characters below). If flag=0, od isable, flag=1, enable. [B2µ] READBU flg. cflg Read button number. If flag=1 wait for next button. If flag=0 send number of last button pushed. If cflg=1 send currer rent digitizing tablet coordinate, if next button, if gl=0 send current (o) spick/trackball	LUTG index entry		FIXWOV	weather states a state of the state of the states of the s			DEBUG flag	
LUTR index, entry Make entry in Red LUT. Place entry at location given in index. [18,1] PMCTL*0000 Set pixel mover mode; redrte, greenrte, and blue banks. [BF _H] Call ENTGRA Enter Graphics Mode DLCH index DLCH index DDLCH index DDLC								
Indexted one sind, LUTRMP code, sind, eind, sent, ent Load LUTs with ramp function [1D _H] redrte, greenrte, bluerte and blue banks. [BF _H] Call SENDT (val) Send one byte to output buffer. Call SEND2 (val) Send one byte to output buffer. LUTRMP code, sind, eind, sent, ent Load LUTs with ramp function specified by func. [1E _H] Change LUT routing function specified by func. [1E _H] Cull T Exit graphics mode, [FF _H] RDMASK mask Set Read Mask. All pixel values read from image are ANDed with mask. Set Read Mask. All pixel values read from image are ANDed with mask. Set readback mode to ASCII decimal (flag = OFF or 0) or binary (flag = ON or 1). [D3 _H] NULL No operation. [00 _H] Image Transmissions SCRORG x, y Set screen origin register to x, y [36 _H] Redefine special characters (see special Characters below). If flag=0, disable, flag=1, enable. [B2 _H] READBU flg. cflg Read button number. If flag=1 wait for next button. If flag=0 send number of disable, flag=1, enable. [B2 _H] READBU flg. cflg Read button number. If flag=1 send currer rent digitizing tablet coordinate, if clfg=0 send current joystick/trackball REPLAY Dump last 32 characters input buffer to ALPHASIC	LUTR index, entry		PMCTI * 0.0.0.0		The second second second second second	Contraction of the second state of the second state of the	A DESCRIPTION ROLL RECORDENTION	
LUTRMP code, sind, eind, sent, ent Load LUTs with ramp function [1D _H] green, and blue banks. [BF _H] green, and blue banks. [BF _H] Send 2 bytes (16 bits) to output buffer. HOSTO strlen, string to the I eind, sent, ent Change LUT routing function specified by func. [1E _H] QUIT Exit graphics mode. [FF _H] All Pixel values read from image are ANDed with mask. [9E _H] Send 2 bytes (16 bits) to output buffer. HOSTO strlen, string to the I 1Model One/20 and Model One/25 Users Only SCRORG x, y Set screen origin register to x, y [36 _H] Redefine special characters (see values are val, val, val. [29 _H] SCRORG x, y Set screen origin register to x, y [36 _H] Redefine special Characters below). If flag=0, disable, flag=1, enable. [B2 _H] Redefine special Characters below). If flag=0, rest button. If flag=0 send number of last button pushed. If clig=1 send cur- rent digitizing tablet coordinate, if clig=0 send current joystick/trackball RELABU fig. clig=0 send current joystick/trackball RELAY Nouth Nouth							DINLOAD	
eind, sent, ent QUIT Exit graphics mode. [FH]1 Readback Commands Readback Commands No operation. [00H] LUTRTE† func Change LUT routing function specified by func. [1EH] PIXELS nrows, ncols, val Pixel by pixel image definition. Pixel values are val, val, val. [29H] SCRORG x, y Set screen origin register to x, y [36H] Readback Commands All Read commands require a 7-bit ASCII ACK. NULL No operation. [00H] PIXELS nrows, ncols, val Pixel by pixel image definition. Pixel values are val, val, val. [29H] SCRORG x, y Set screen origin register to x, y [36H] Readback Commands Readback Commands No operation. [00H] PIXELS nrows, ncols, val Pixel by pixel image definition. Pixel values are val, val, val. [29H] TEKEM flag Invoke Tektronix emulator. [39H] TEKEM flag Invoke Tektronix emulator. [39H] Readback Commands Readback Commands Readback Commands Readback Commands No operation. [00H] Readback Commands Readback Commands Readback Commands No operation. [00H] No oper	LUTRMP code, sind,		rearte, greenite, blacite		Call SEND2 (val)	Send 2 bytes (16 bits) to output buffer.	HOSTO stripp stripp	
LUTRTE† func Change LUT routing function specified by func. [1E _H] RDMASK mask Set Read Mask. All pixel values read from image are ANDed with mask. [9E _H] All Read commands require a 7-bit ASCII ACK. NOLL NOLL NOLL Display contents of CPU [BD _H] tModel One/20 and Model One/25 Users Only Fixel by pixel image definition. Pixel values are val, val, val. [29 _H] SCRORG x, y Set screen origin register to x, y [36 _H] Redefine special Characters (see values are val, val, val. [29 _H] Redefine special Characters below). If flag=0, disable, flag=1, enable. [B2 _H] Redefine special Characters (see values are val, val, val. [29 _H] Redefinition. Pixel values are r, g, b. [28 _H] REXEM flag Invoke Tektronix emulator. [39 _H] Read button number. [39 _H] Read button number of last button pushed. If clog=1 send current joystick/trackball REPLAY Dump last 32 characters input buffer to ALPHASIN			OUIT	• 11-	Readback Commands			-
by func. [1E _H] from image are ANDed with mask. RDMODE flag Set readback mode to ASCII decimal PEK addr Display contents of CPU †Model One/20 and Model One/20 and Model One/25 Users Only Image Transmissions SCRORG x, y Set screen origin register to x,y [36 _H] Set screen origin register to x,y [36 _H] POKE addr, data POKE addr, data Image Transmissions ScroRG x, y Set screen origin register to x,y [36 _H] Redefine special characters (see READBU flg, cflg Read button number. If flag=1 wait for next button. If flag=1 send current joystick/trackball READBU flg, cflg Read button number. If flag=1 send current joystick/trackball REPLAY Dump last 32 characters input buffer to ALPHASIN	LUTRTE† func	Change LUT routing function specified			All Read commands requ	uire a 7-bit ASCII ACK.		
#Model One/20 and Model One/20 users Only [BB _µ] [BB _µ] [BB _µ] Image Transmissions SCRORG x, y Set screen origin register to x, y [36 _µ] of 1). [D3 _µ] POKE addr, data POKE addr, data PIXEL8 nrows, ncols, val Pixel by pixel image definition. Pixel values are val, val, val. [29 _µ] SPCHAR char, flag, code Special Characters (see Special Characters below). If flag=0, disable, flag=1, enable. [B2 _µ] READBU flg, cflg Read button number. If flag=1 wait for next button. If flag=1 wait for next button. If flag=1 send current joystick/trackball REPLAY Dump last 32 characters input buffer to ALPHASIC		by func. [1E _H]			BDMODE flag	Set readback mode to ASCII decimal	PEEK addr	
Image Transmissions SCRORG x, y Set screen origin register to x, y [36 _H] or 1). [D3 _H] PORE addr, data memory. [BE _H] PIXEL8 nrows, ncols, val Pixel by pixel image definition. Pixel values are val, val, val. [29 _H] SPCHAR char, flag, code Set screen origin register to x, y [36 _H] READBU flg, cflg Read button number. If flag=1 wait for next button. If flag=1 wait for next button. If flag=1 send current joystick/trackball REPLAY Dump last 32 characters input buffer to ALPHASIt	+Model One/20 and Model One	ne/25 Users Only			HEMODE hag			- 112
Image Praisings of the log in log is a problem in log i			SCBOBG X V				POKE addr, data	
PixeLs mows, ncols, val Pixel by pixel image definition. Pixel code Special Characters below). If flag=0, disable, flag=1, enable. [B2 _H] next button. If flag=0 send number of last button pushed. If cflg=1 send cur-rent digitizing tablet coordinate, if clfg=0 send current joystick/trackball								
PIXELS nrows, ncols, Pixel by pixel image definition. Pixel disable, flag=1, enable. [B2 _H] last button pushed. If cflg=1 send cur- r, g, b values are r, g, b. [28 _H] TEKEM flag Invoke Tektronix emulator. [39 _H] rent digitizing tablet coordinate, if	PIXEL8 nrows, ncols, val				READBO lig, clig		REPLAY	•
r, g, b values are r, g, b. [28 _H] TEKEM flag Invoke Tektronix emulator. [39 _H] rent digitizing tablet coordinate, if clfg=0 send current joystick/trackball		- 11z				0		input buffer to ALPHASIO pol
clfg=0 send current joystick/trackball			TEKEN flog	- 11.				
	r, g, b	values are r, g, b. [28 _H]	I ENEIVI TIAG	invoke rektronix emulator. [39 _H]				
coordinate. [JAA]				*				
						Coordinate. [3AH]		

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Send x,y to 8 _H]	Macro Programming MACDEF num	Define Macro number num. Macro is
of first error.		terminated by MACEND command. [8B _H]
at. Func speci-	MACEND MACERA num	End of Macro definition. [0C _H] Erase Macro num. [8C _H]
f pixel to port	MACRO num	Execute Macro num. [0B _H]
pixel value to	Interactive Device Support BLINKC	Clear blink table. [23 ₄]
9 _H] e of pixels in	BLINKD lut, index	Disable Blink of specified lut, index. [21 _H]
cs mode. [96 _H] encoded. rindow in run-	BLINKE lut, index entry1, entry2	Enable Blink specified lut, index. Use entry 1 and entry 2 as alternate values. [20 _µ]
oort in gra-	BLINKR frames BUTTBL index, nmac	Blink rate is frame times. [22 _H] Place Macro nmac in Button Table at
g in csum.	BUTTON index	location index. [AA _H] Execute Macro indicated by Button
creg with x,y.	FLUSH	Table at location index. $[AB_H]$ Empty function button event queue. $[15_H]$
o cdst. [A1 _H] n cdif. [A3 _H]	RDPIXR vreg	Places value of pixel at current point in specified value register vreg. [AF _H]
g into vsum.	Coordinate Register Assign	ment
gister vreg	CREG 0	Current Point. Starting point of gra- phics primitives. Updated by a MOVE or DRAW command.
o vdst. [A5 _H] nto vdif. [A7 _H]	CREG 1	Joystick/Trackball Cursor Location. Current coordinate from the joystick or trackball. Updated automatically.
Ipha-numeric	CREG 2	Digitizing Tablet Cursor Location. Cur- rent coordinate from the digitizing
am Translator.	CREG 3	tablet. Updated automatically. Coordinate Origin. Coordinate of the center of image memory.
ter. [A8 _H] aracters. [B6 _H]	CREG 4	Screen Origin. Coordinate of the pixel
ode. String	CREG 5	in the center of the screen. Crosshair 0 Location in Image Memory.
[FB _H] nost. [B5 _H]	CREG 6	Crosshair 1 Location in Image Memory.
	CREG 7*†	Crosshair 2 Location in Image Memory.
memory.	CREG 8*†	Crosshair 3 Location in Image Memory.
memory.	CREG 9	Clipping Window Origin. Lower left
in CPU		corner of current clipping window. All vectors are clipped to this window.
of HOSTSIO D port. [BC _H]	CREG 10	Clipping Window Origin. Upper right corner of current clipping window. All
	CREG 11*, 12*	vectors are clipped to this window. Diagonal corners for PIXMOV com- mand source window definition.