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IDENTIFICATION

PRODUCT CODE: AC-E848D-MC
PRODUCT NAME: CXAAAD0 AALL/VT01-A MODULE
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTRACT:-----

AAA IS A IOMOD THAT EXERCISES THE A11 SCOPE CONTROLLER. A CONFIDENCE LOGIC TEST IS EXECUTED ON THE CONTROL STATUS X POSITION AND POSITION ON REGISTERS. ALL LOGIC ERRORS ARE REPORTED TO THE CONSOLE TELETYPE. THE MAJOR PORTION OF THIS MODULE IS DEFERRED TO LEVEL 0 SERVICE. A SIX LETTER MESSAGE (PIP-11) WILL BE PLOTTED ON THE SCREEN DURING EXECUTION. THIS ROUTINE IS INTERRUPT DRIVEN & FLICKERS MAY RESULT IF OTHER DEVICES ARE BEING TESTED

2. REQUIREMENTS:-----

HARDWARE: A11 INTERFACE WITH A VT01-A (DIGITAL MODIFIED TEXTRONICS X-611 DISPLAY)

STORAGE:: AAA REQUIRES:
1. DECIMAL WORDS: 288
2. OCTAL WORDS: 0440
3. OCTAL BYTES: 1100

3. PASS DEFINITION:-----

ONE PASS OF THE XAAB MODULE CONSISTS OF DISPLAYING 55,296 POINTS ON THE SCREEN. THIS MEANS THAT 55,296 DATA TRANSFERS OCCURRED ON THE UNIBUS.

4. EXECUTION TIME:-----

VARIABLES WITH SCOPE DELAY BUT SHOULD TAKE AN AVERAGE OF -----
----- TO COMPLETE ONE PASS. WHEN RUNNING ALONE.

5. -----
CONFIGURATION PARAMETERS:-----

DEFAULT PARAMETERS:

DVA: 176756, VCT: 140, BR1: 4

REQUIRED PARAMETERS: NONE

6. -----
DEVICE OPTION SETUP:-----

A. TURN ON SCOPE POWER.

7. -----
MODULE OPERATION:-----

7.1 TEST SEQUENCE:

A. START:

USING THE DEVICE ADDRESS, THIS SECTION OF CODE, DETERMINES THE CONTROL, X AND Y POSITION ADDRESSES, AND VECTORS.

B. PRIMP:

IN THIS SECTION, THE X AXIS, Y AXIS AND CONTROL REGISTERS ARE LOADED. THE SCOPE IS ENABLED AND AN 'EXIT' RETURN TO THE MONITOR.

C. AASVC:

UPON A SCOPE INTERRUPT, THE PROGRAM WILL RETURN TO THIS CODE. ENTER DEFERRED SERVICE MODE. AND TEST FOR A MODE FLAG. IF NO MODE FLAG, REPORT IT AS AN ERROR.

D. AASVCA:

THRU CHAR13: THIS SECTION SELECTS
THE PROPER POINTS TO BE INTENSIFIED
ON THE SCREEN.

E. CHAR11:

IN THIS CODE, THE COLOR AND
CHANNEL BITS ARE ALTERNATED
TO DISPLAY EACH CHANNEL AND COLOR
IN A 611/613 SCOPE IS CONNECTED
ALTERNATING CHARACTERS WILL HAVE
ALTERNATING INTENSITY LEVELS.

F. CHAR20:

IN THIS SECTION, THE PASS COUNT
IS DECREMENTED AND TESTED.
IF IT DID NOT BECOME ZERO, THEN
SELECT ANOTHER CLOCK RATE
AND RESUME COUNTING.
A ZERO PASS COUNT THE CONTROL
AND PRESET REGISTER ARE
CLEARED AND 'ENDPAS' IS
REPORTED.

8. OPERATOR OPTIONS:

NONE

9. NON-STANDARD PRINTOUTS:

NONE: ALL PRINTOUTS HAVE THE STANDARD FORMATS DESCRIBED
IN THE DEC/X11 DOCUMENT MAINDEC-11-DYQAAA

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;AA-11 DEC/X11 EXERCISER MODULE
000000- IOMOD <AAAD > 176756 140410 10043
000000- MODULE 140000 176756 140410 10043
; TITLE AAAD DEC/X11 SYSTEM EXERCISER MODULE
; DDXCUM VERSION 6 23-MAY-78
;***** LIST BIN *****
000000- BEGIN:
000000- MODNAM: -ASCII /AAAD / ;MODULE NAME-
000000- XFLAG: -BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
000000- ADDR: 176756*0 ;1ST DEVICE ADDR.
000010- VECTOR: 14040 ;1ST DEVICE VECTOR.
000012- BR1: -BYTE PRTY4+0 ;1ST BR LEVEL-
000013- BR2: -BYTE PRTY+0 ;2ND BR LEVEL-
000014- DVID1: +1 ;DEVICE INDICATOR 1.
000015- SR1: OPEN ;SWITCH REGISTER 1
000020- SR2: OPEN ;SWITCH REGISTER 2
000022- SR3: OPEN ;SWITCH REGISTER 3
000024- SR4: OPEN ;SWITCH REGISTER 4
;*****
000026- 140000 STAT: 140000 ;STATUS WORD.
000030- 000232- INIT: START ;MODULE START ADDR.
000032- 000224- SPOINT: MODSP ;MODULE STACK POINTER.
000034- 000060- PASCNT: 0 ;PASS COUNTED.
000036- 000144- ICONT: 100. ;# OF ITERATIONS PER PASS=100.
000040- 000000- ICONT: 0 ;LOC TO COUNT ITERATIONS
000042- 000000- HRDCNT: 0 ;LOC TO SAVE TOTAL HARD ERRORS
000044- 000000- HRDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS
000046- 000000- SOFPAS: 0 ;LOC TO SAVE SOFT ERRORS PER PASS
000050- 000000- HRDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS
000052- 000000- SYSCNT: 0 ;# OF SYS ERRORS ACCUMULATED
000054- 000000- COMPIC: 0 ;RESERVED FOR MONITOR USE
000056- 000000- RES1: 0 ;RESERVED FOR MONITOR USE
000058- 000000- RES2: 0 ;RESERVED FOR MONITOR USE
000060- 000000- SVR1: OPEN ;LOC TO SAVE R1.
000062- 000000- SVR2: OPEN ;LOC TO SAVE R2.
000064- 000000- SVR3: OPEN ;LOC TO SAVE R3.
000066- 000000- SVR4: OPEN ;LOC TO SAVE R4.
000070- 000000- SVR5: OPEN ;LOC TO SAVE R5.
000072- 000000- SVR6: OPEN ;LOC TO SAVE R6.
000074- 000000- CSRA: OPEN ;ADDR OF CURRENT CSR.
000076- 000000- WASADR: OPEN ;ADDR OF GOOD DATA, OR
000078- 000000- ASTAT: OPEN ;CONTENTS OF CSR.
000080- 000000- ASB: OPEN ;ADDR OF BAD DATA, OR
000082- 000000- AWAS: OPEN ;STATUS REG CONTENTS.
000084- 000000- RSTRT: RSTRT ;TYPE OF ERROR
000086- 000000- WDFR: OPEN ;EXPECTED DATA.
000088- 000000- WDFR: OPEN ;ACTUAL DATA.
000090- 000000- WDFR: OPEN ;RESTART ADDRESS AFTER END OF PASS
000092- 000000- WDFR: OPEN ;WORDS TO MEMORY PER ITERATION
000094- 000000- WDFR: OPEN ;WORDS FROM MEMORY PER ITERATION

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000120- 000000 INTR: OPEN ;# OF INTERRUPTS PER ITERATION
000122- 000043 IDNUM: 43 ;MODULE IDENTIFICATION NUMBER=43
000040- ;MODULE STACK STARTS HERE.
000224- MODSP:
;*****
;REGISTER ADDRESS DEFINITIONS
000224- 000000 SCSR: OPEN
000226- 000000 DACO: OPEN
000230- 000000 DACI: OPEN
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000232- 012767 000322 177656 START: MOV #210, WDFR
000240- 012767 000322 177656 MOV #210, INTR
000246- 012767 000011 177644 MOV #11, INTR
000254- 016705 177526 RESTRT: MOV ADDR, R5 ;GET 1ST ADDRESS
000260- 010567 177740 MOV R5, SCSR ;BUILD REG. ADDRESSES
000264- 005795 TST (R5)
000266- 010567 177734 MOV R5, DACO
000272- 005795 TST (R5)
000300- 016700 177504 MOV R5, DACI
000304- 012720 000342 MOV VECTOR, R0 ;GET VECTOR ADDRESS
000310- 016720 177476 MOV #A11, (R0) ;SET UP INTR. RETURN
000316- 016720 177704 MOV BR1, (R0) ;SET UP PRIORITY
000322- 012767 000144 000546 MOV SCSR, CSRA ;PUT CSR ADDRESS IN CSRA
000330- 012777 000100 177656 MOV #100, COUNT ;DO IT 100. TIMES PER PASS
000336- 104400 000000- EXIT, BEGIN ;TURN ON THE INTERRUPT
;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
;INTERRUPT SERVICE ROUTINES TO DISPLAY "PDP-11" ON SCOPE
000342- A11:
000342- 000004 000000- 000352- PIRQS, BEGIN, A11A ; QUEUE UP TO CONTINUE AT A11A AND RTI
000350- 000352- 177646 A11A: TSTB @SCSR ;IS DONE SET
000356- 100413 BNE A11B ;IS DONE IS SET
000360- 012767 177640 177630 BIC #100, @SCSR ;SAVE CONTENTS OF THE CSR IN ACSR
000366- 042777 000100 ***** TURN OFF INTERRUPT *****
000374- 104405 000000- 000000- A11B: BEGIN NULL ;NONE DID NOT SET
000402- 104410 000000- ENDS, BEGIN ;
000406- 012767 000000- A11B: MOV #0, XPOS ;SHOULD WORK FOR ALL SCOPES
000414- 005067 000444 MOV #6, CNTR ;6 CHARACTER COUNT
000420- 012767 000006 000446 MOV #TEXT, PTR ;PDP-11
000426- 012767 001014 000436 MOV #CHARS, @VECTOR ;POINT NEXT INTR TO CHAR3
000434- 012777 000540- 177346

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AAAD0.P11 12-OCT-78 11:39
276 000442 017767 000424 000410 TXT1: MOV @PNTR, AAR2
277 000450 015767 000410 000412 PLOT CHARACTER
278 000452 052767 000410 177540 CHAR: MOV YPOS, YPT
280 000464 012767 177773 000362 MOV #2, @SCSR ;INIT ENTER WITH SCOPE INTERRUPT
281 000472 017767 177771 000356 CHAR1: MOV #5, AAR0 ;ENABLE INTENSIFY OF LOADING Y
282 000500 017767 000354 000354 MOV #7, AAR1 ;MATRIX COUNT (ROW)
283 000506 005267 000346 000354 MOV @AAR2, AAR3 ;GET CHARACTER
284 000512 108167 000344 CHAR2: INC AAR2
285 000516 100026 BPL CHAR13 ;INTENSIFY POINT?
286 000520 016777 000342 177500 MOV XPOS, @DACO ;NO
287 000526 016777 000342 177474 MOV YPOS, @DAC1 ;LOAD X
288 000534 104400 000000 EXIT$, BEGIN ;LOAD Y AND INTENSIFY
289 ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
290
291 000540 CHAR3:
292
293 000540 000004 000000 000546 PIRQS, BEGIN, AS ; QUEUE UP TO CONTINUE AT AS AND RTI
294
295 000546 105777 177452 AS: TST @SCSR ;IS DONE SET
296 000552 100410 BNE CHAR13 ;BR IF DONE SET
297 000554 017767 177444 177320 MOV @SCSR, ACSR ;SAVE CONTENTS OF CSR
298 *****
299 000562 104405 000000 000000 HDRRS, BEGIN, NULL ;DONE DID NOT SET
300 *****
301 000570 104410 000000 000262 CHAR13: ENDS, BEGIN ;
302 000574 062767 000070 000250 INC AAR2 ;NEXT POINT
303 000602 062767 000070 000250 BNE CHAR2 ;DONE ALL POINTS IN A COLUMN?
304 000606 001341 MOV YPT, YPOS ;NEXT COLUMN
305 000610 016767 000254 000246 ADD #70, XPOS ;ADD SCALE
306 000614 062767 000070 000242 INC AAR0 ;DONE ALL COLUMNS?
307 000630 001320 BNE CHAR1 ;NO
308 000632 062767 000070 000226 ADD #70, XPOS ;YES, POSITION FOR NEXT CHARACTER
309 000640 062767 000002 000224 ADD #2, PNTR ;NEXT CHARACTER
310 000642 005267 177144 TST @AAR1 ;TWO COLOR SCOPE ??
311 000652 001441 BNE CH4A ;BR IF NOT
312 000654 032777 001000 177342 BIT #1000, @SCSR ;GREEN BIT SET ??
313 000662 001010 BNE #5 ;BR IF SET
314 000664 052767 001000 177332 MOV @SCSR, ACSR ;SAVE CONTENTS OF CSR
315 000672 012777 000714 177110 3S: MOV @AAR4, @VECTOR ;NO SET FOR GREEN
316 000700 104400 000000 177110 EXIT$, BEGIN ;POINT NEXT INTR TO CHAR4
317 000704 042777 001000 177312 2S: BIC #1000, @SCSR ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
318 000712 000767 BR 3S ;CLEAR GREEN BIT
319
320 000714 CHAR4:
321
322 000714 000004 000000 000722 PIRQS, BEGIN, 1S ; QUEUE UP TO CONTINUE AT 1S AND RTI
323
324 000722 105777 177276 1S: TST @SCSR ;WAS THE DONE BIT SET??
325 000726 100410 BNE 2S ;BR IF YES
326 000730 017767 177270 177144 MOV @SCSR, ACSR ;SAVE CONTENTS OF CSR
327 *****
328 000736 104405 000000 000000 HDRRS, BEGIN, NULL ;DONE DID NOT SET
329 *****
330 000744 104410 000000 177032 2S: ENDS, BEGIN ;
331 000750 012777 000540 177032 MOV #CHAR3, @VECTOR ;RESET VECTOR

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AAAD0.P11 12-OCT-78 11:39
332 000756 005367 000112 CH4A: DEC CNTR ;DONE ALL?
333 000766 005367 000112 BNE TX11 ;NO
334 000784 042777 000002 177232 DEC #2, @SCSR ;INIT AND ERASE
335 000772 005367 000100 DEC COUNT ;COUNT IT
336 000776 001000 177220 BNE 1S ;BR IF 100. TIMES
337 001000 005077 177220 CLR @SCSR
338 001004 104413 000000 1S: ENDS, BEGIN ;SIGNAL END OF ITERATION.
339 001004 104413 000000 177372 JMP AAL1B ;MONITOR SHALL TEST END OF PASS
340
341 001010 000167 177372 ;GO DO IT AGAIN
342
343 ;TEXT FOR AAL11 DAC WITH SCOPE OPTION
344 ;TEXT = "PDP11"
345 TEXT: P
346 PD
347 DASH
348 NI
349 NI
350 001030 177 011 P: -BYTE 177, 11, 11, 11, 6
351 001033 011 006 010 DASH: -BYTE 0, 10, 10, 10, 0
352 001035 000 010 010 101 XD: -BYTE 177, 101, 101, 101, 76
353 001040 010 000 177 076 177 N1: -BYTE 0, 102, 177, 100, 0
354 001042 177 101 076
355 001045 101 102
356 001047 000 000
357 001052 100 000 .EVEN
358
359 001054 000000 AAR0: OPEN ;AAL1 (ROW)
360 001056 000000 AAR1: OPEN ;AAL1 (COLUMN)
361 001058 000000 AAR2: OPEN ;CHARACTER POINTER
362 001060 000000 AAR3: OPEN ;HOLDS CHARACTER
363 001062 000000 YPOS: OPEN
364 001064 000000 XPOS: OPEN
365 001066 000000 YPT: OPEN
366 001070 000000 PNTR: OPEN
367 001072 000000 CNTR: OPEN
368 001074 000000 COUNT: OPEN
369 001076 000000 ;KEEPS TRACK OF SWIPES PER PASS
370
371 000001 .END

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AAR0	001054R	280*	307*	360#															
AAR1	001056R	281*	303*	361#															
AAR2	001058R	282*	304*	362#	362#														
AAR3	001060R	283*	305*	363#															
AA11	000342R	249	258#																
AA11A	000352R	260	262	263#															
AA11B	000406R	264	265	266#															
ACSR	000102R	211#	212*	297*	326*														
ADDR	000006R	171#	242*																
ADDR22=	001000	229#																	
ASB	000106R	213#																	
ASPT	000104R	213#																	
AWAS	000110R	216#																	
AS	000546R	293	295#																
BEGIN	000000R	174#	254	260	268	270	288	293	299	301	317	322	328	330					
BIT0	000001	229#																	
BIT1	000002	229#																	
BIT10	002000	229#																	
BIT11	004000	229#																	
BIT12	010000	229#																	
BIT13	020000	229#																	
BIT14	040000	229#																	
BIT15	000000	229#																	
BIT2	000004	229#																	
BIT3	000010	229#																	
BIT4	000020	229#																	
BIT5	000040	229#																	
BIT6	000100	229#																	
BIT7	000200	229#																	
BIT8	000400	229#																	
BIT9	001000	229#																	
BREAKS=	104407	229#																	
BRI	000012R	179#	250																
BZ	000018R	190#																	
BZODS	104421	229#																	
CDATS=	104412	229#																	
CHAR	000450R	278#																	
CHAR1	000574R	281#	308																
CHAR13	000574R	281#	306	302#															
CHAR2	000512R	284#	304	331															
CHAR3	000540R	275	291#																
CHAR4	000756R	316	340#																
CNTR	001074R	273*	332*	368#															
CONFIC	000056R	199#																	
COUNT	001076R	286#	325*	369#															
CSWA	000128R	171#	251*																
DACO	000226R	233#	245*	286*															
DAC1	000230R	234#	247*	287*															
DASH	001035R	347	352#																
DATES=	104404	229#																	
DVID1	000014R	181#																	
END1S	104413	229#	330	301	330														
ENDS	104410	229#	270																

ERRTYP	000106R	214#	254	288	317														
ETPAC=	104415	229#																	
GWBUFS	104414	229#																	
HRDCHT	000044R	194#	268	299	328														
HRDERS	104405	229#																	
HRDPAS	000050R	191#																	
ICOUNT	000036R	191#																	
ICOUNT	000040R	192#																	
IDNUM	000128R	171#																	
INTR	000030R	188#																	
INTR	000120R	220#	239*	240*															
NAP22S=	104416	229#																	
MODHAM	000000R	179#																	
MODSP	000224R	189	227#																
MSGNS	104403	229#																	
MSGSS	104402	229#																	
MSGSS	104401	229#																	
NULL	000000	229#	268	299	328														
NI	001047R	348	349	356#															
OPEN	000000	176	182	184	185	202	203	204	205	206	207	208	209						
		211	215	216	218	219	220	229#	232	233	234	360	361						
		217	363	364	366	367	368	369											
OTDAS	104420	229#																	
P	001030R	344	346	350#															
PASCNF	000034R	190#																	
PIRS	000004R	170#	260	293	322														
PNTR	001072R	274*	276	310*	367#														
POPSP	005725	229#																	
POPSP2	022625	229#																	
PRTY0	000006	180#	229#																
PRTY0	000000	179#																	
PRTY1	000040	229#																	
PRTY2	000100	229#																	
PRTY3	000140	229#																	
PRTY4	000200	179	229#																
PRTY5	000240	229#																	
PRTY6	000300	229#																	
PRTY7	000340	229#																	
PS	177776	229#																	
PSW	177776	229#																	
PUSH	005746	229#																	
PUSH2	005746	229#																	

SPSIZ =	000040	1#	222				
SR1	000016R	182#	311				
SR2	000029R	183#					
SR3	000029R	184#					
SR4	000024R	185#					
START	000232R	188#	238#				
STAT	000026R	187#					
SVR0	000062R	202#					
SVR1	000064R	205#					
SVR2	000066R	204#					
SVR3	000079R	205#					
SVR4	000072R	206#					
SVR5	000074R	207#					
SVR6	000076R	208#					
SYSCNT	000052R	197#					
TEXT	001014R	174#	344#				
TRDPFD=	000022	279#					
TXT1	000442R	276#	333				
VECTOR	000010R	178#	248				
WASADR	000104R	212#	275*	316*	331*		
WDFR	000116R	219#	238*				
WDTD	000114R	218#					
XD	001042R	345#	354#				
XFLAG	000065R	176#					
XPOS	001066R	277#	286	306*	309*	365#	
VPOS	001064R	278#	278	287	302*	308*	364#
YPT	001070R	278#	305	366#			

- ABS. 000000 000
 001100 001

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0
 XAAADO, XAAADO/SOL/CRF:SYM=DDXCON, XAAADO
 RUN-TIME: 11.3 SECONDS
 RUN-TIME RATIO: 11/3=3.6
 CORE USED: 7K (13 PAGES)