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•REM -

IDENTIFICATION

PRODUCT CODE: AC-E857F-MC
PRODUCT NAME: CXPABFG PA611 PUNCH MODULE
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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MAIN DEC CHANGE NOT
MAY BE REQUIRED FOR
PROGRAM TO OPERATE

1. ABSTRACT

PAB IS AN IOMOD THAT EXERCISES UP TO 16 HIGH SPEED PUNCHES BY PUNCHING A STANDARD BINARY COUNT PATTERN ON EACH PUNCH. IF REPORTS ANY ERRORS ON THE CONSOLE TTY. THE MODULE IS DESIGNED TO ACTIVATE AND RUN ALL SELECTED DEVICES CONCURRENTLY.

2. REQUIREMENTS:

HARDWARE: AT LEAST ONE PA-611-P CONTROL UNIT AND ONE PP67C/D PUNCH.

STORAGE:: PAB REQUIRES:

1. DECIMAL WORDS: 376
2. OCTAL WORDS: 0570
3. OCTAL BYTES: 1360

3. PASS DEFINITION:

ONE PASS OF THE PAB MODULE CONSISTS OF PUNCHING 2048. (TOTAL) CHARACTERS.

4. EXECUTION TIME:

THE PAB RUNNING ALONE ON A PDP11/05 SYSTEM TAKES APPROXIMATELY --- MINUTES PER PASS.

5. CONFIGURATION REQUIREMENTS:

DEFAULT PARAMETERS:

DEVADR: 172700, VECTOR: 300, BR1:4, DEVcnt:1

REQUIRED PARAMETERS:

AT CONFIGURATION TIME THE USER MUST MODIFY "VECTOR" IF ASSIGNED VALUE IS NOT 300.

6. DEVICE/OPTION SET-UP:

- A. INSURE ALL PUNCHES TO BE TESTED ARE LOADED WITH BLANK PAPER TAPE.
- B. TURN ON ALL PUNCHES TO BE TESTED.

7. MODULE OPERATION:

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TEST SEQUENCE:

- A. CLEAR DEVICE AND DATA TABLES
- B. SET UP VECTORS FOR ALL ACTIVE DEVICES AND
STORE DEVICE NO. FOR SELECTED DEVICES
- C. TURN ON INTERRUPT ENABLE FOR ALL ACTIVE DEVICES
- D. INTERRUPT SERVICE

1. TEST AND REPORT ANY ERROR BITS IN CSR
 2. UPDATE AND OUTPUT NEXT CHARACTER IN PATTERN
 3. WAIT FOR NEXT INTERRUPT
 4. REPEAT 1 THROUGH 3 UNTIL 2096. (TOTAL)
CHARACTERS HAVE BEEN PUNCHED
- E. TURN OFF ALL ACTIVE DEVICES. REPORT END OF PASS
AND RESTART AT C.

JSR TABLE:

TO LINK THE INDIVIDUAL INTERRUPTS WITH THE SERVICE ROUTINES THERE IS A JSR TABLE CONTAINING 16 ENTRIES. EACH DEVICE VECTOR IS SET UP TO POINT TO A UNIQUE JSR WITHIN THE TABLE WHICH TRANSFERS CONTROL TO THE INTERRUPT SERVICE ROUTINE AND POINTS R5 TO AN OFFSET THAT THE SERVICE ROUTINE USES TO GENERATE THE CORRECT REGISTER ADDRESS AND DATA TABLE ENTRY.

FIFO QUEUE:

TO ALLOW THE SERVICE ROUTINE TO USE THE SAME GPR'S FOR SERVICING UP TO 16 CONCURRENT INTERRUPTS THE REQUESTS MUST BE STORED IN A QUEUE AND SERVICED LATER. THIS IS ACCOMPLISHED BY USING A FIFO (FIRST-IN-FIRST-OUT) QUEUE. THE QUEUE HAS 16 BYTE ENTRIES AND THE INTERRUPT SERVICE STORES THE OFFSET IN THE QUEUE, UPDATES THE QUEUE POINTER AND THEN EXECUTES A PIRO TO CONTINUE SERVICING THE QUEUE AT A LOWER PRIORITY THAN THE INTERRUPTS REQUESTS.

ERROR RETURN QUEUES:

WHEN AN "ERROR" OR "DATERE" CALL IS EXECUTED, THE MONITOR QUEUES UP THE RETURN ADDRESS IN ITS "QUEUE". SINCE IT IS POSSIBLE FOR ANOTHER LINE TO HAVE BEEN QUEUED UP AT A HIGHER PRIORITY, IT COULD GET CONTROL OF THE MODULE'S PIRO SERVICE ROUTINES AND CLOBBER THE REGISTER INFORMATION REQUIRED BY THE FIRST LINE WHEN IT RECEIVES CONTROL BACK AGAIN AFTER THE ERROR REPORT. TO PREVENT THIS FROM HAPPENING INFORMATION NECESSARY TO RESTORE THE APPROPRIATE REGISTERS (LINE OFFSET) IS SAVED IN AN ERROR RETURN QUEUE PRIOR TO THE ERROR CALL AND RESTORED FROM THE QUEUE WHEN CONTROL IS RETURNED AFTER THE ERROR CALL. THERE IS ONE 16 BYTE QUEUE (FIFO) REQUIRED TO ACCOMPLISH THIS TASK:

TEQ XMTR ERROR RETURN QUEUE

TO CONTROL THE OPERATION OF THE QUEUE TWO POINTERS ARE REQUIRED:

TEQP1 SAVES R1 IN THE XMTR QUEUE
TEQP2 RETRIEVES R1 FROM THE XMTR QUEUE

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A. LOCATION DVID1 (PAB14) MAY BE CHANGED TO SELECT ANY
COMBINATION OF DEVICES TO BE TESTED. BIT0=DEVO
BIT1=DEV1 BIT15=DEV15 IF DVID1=0 THE MODULE WILL BE
DROPPED FROM TEST.

B. MEANING OF SR1 BITS 7 THRU 0
SET = DISABLE PUNCHING ON THAT DATA CHANNEL.
CLEAR = ALLOW " " " " "

9.

NON-STANDARD PRINTOUTS

NONE: ALL PRINTOUTS HAVE THE SAME FORMATS DESCRIBED
IN THE DEC/X11 DOCUMENT.

5PABF11P DEC/X11 EXERCISER MODULE

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000000* IDNOD: <PARF> 172700 0 4//2048/54
000000* MODULE 140006 PABF / 172700/0 4//2048/54
000000* TITLE PARF DEC/X11 SYSTEM EXERCISER MODULE
000000* DDXCOM VERSION 6 23-MAY-78
000000* .LIST BIN
000000* *****

000000* 040520 043102 040 *DECTN: MODNAM: ASCII /PARF / ;MODULE NAME
000005* 360 XFLAG: BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
000010* 172700 ADDR: 172700+0 ;1ST DEVICE ADDR
000015* 000000 VECTOP: CAA ;1ST DEVICE VECTOR.
000020* 200 BR1: .BYTE PRTV4+0 ;1ST RR LEVEL.
000025* 300 PR2: .BYTE PRTV0+0 ;2ND RR LEVEL.
000030* 000001 DIVD1: +1 ;DEVICE INDICATOR 1.
000035* 200000 SPOINT: OPEN ;SWITCH REGISTER 1
000040* 200000 SR1: OPEN ;SWITCH REGISTER 2
000045* 000000 SR2: OPEN ;SWITCH REGISTER 3
000050* 000000 SR3: OPEN ;SWITCH REGISTER 4
000055* 000000 SR4: OPEN
000060* 140000 STAT: 140000 ;STATUS WORD.
000065* 000000 INIT: STAPT ;MODULE START ADDR.
000070* 000000 MODSP: MODSP ;MODULE STACK POINTER.
000075* 000000 PASCNT: C ;PASS COUNTER.
000080* 204000 ICOUNT: C ;# OF ITERATIONS PER PASS=2048.
000085* 000000 SOFCNT: C ;LOC TO COUNT ITERATIONS
000090* 000000 HRCNT: C ;LOC TO SAVE TOTAL SOFT ERRORS
000095* 000000 SOHCNT: C ;LOC TO SAVE TOTAL HARD ERRORS
000100* 000000 SOFCAS: C ;LOC TO SAVE SOFT ERRORS PER PASS
000105* 000000 SOHCAS: C ;LOC TO SAVE HARD ERRORS PER PASS
000110* 000000 SYSCNT: C ;LOC TO SAVE SYS ERRORS ACCUMULATED
000115* 000300 RANNUM: C ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
000120* 000000 CONFIG: C ;RESERVED FOR MONITOR USE
000125* 000000 RES1: C ;RESERVED FOR MONITOR USE
000130* 000000 RES2: C ;RESERVED FOR MONITOR USE
000135* 000000 SVR0: OPEN ;LOC TO SAVE R0.
000140* 000000 SVR1: OPEN ;LOC TO SAVE R1.
000145* 000000 SVR2: OPEN ;LOC TO SAVE R2.
000150* 000000 SVR3: OPEN ;LOC TO SAVE R3.
000155* 000000 SVR4: OPEN ;LOC TO SAVE R4.
000160* 000000 SVR5: OPEN ;LOC TO SAVE R5.
000165* 000000 SVR6: OPEN ;LOC TO SAVE R6.
000170* 000000 CSR0: OPEN ;ADDR OF CURRENT CSR.
000175* 000000 SRADR: OPEN ;ADDR OF GOOD DATA, OR
000180* 000000 ACSPL: OPEN ;CONTENTS OF CSR.
000185* 000000 WASADR: OPEN ;ADDR OF BAD DATA, OR
000190* 000000 ASTAT: OPEN ;STATUS REG CONTENTS.
000195* 000000 ERRTYP: C ;TYPE OF ERROR.
000200* 000000 ASR: OPEN ;EXPECTED DATA.
000205* 000000 AWAS: OPEN ;ACTUAL ADDRESS.
000210* 000000 RSTART: REPT ;RESTART ADDRESS AFTER END OF PASS
000215* 000000 WDFP: OPEN ;WORDS TO MEMORY PER ITERATION
000220* 000000 IVTR: OPEN ;WORDS FROM MEMORY PER ITERATION
000225* 000000 ;# OF INTERRUPTS PER ITERATION

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000122* 000054 IDNUM: 54 ;MODULE IDENTIFICATION NUMBER=54
000123* 000040 .PEPT SPSIZ ;MODULE STACK STARTS HERE.
000124* 000224* 000000 .NLIST
000125* 000000 .WORD C
000126* 000000 .LIST
000127* 000000 .ENDR
000128* 000224* MODSP: ;*****MODULE INITIALIZATION ROUTINES*****
000129* 000224* 0112767 202900 177662 START: MOV #1024,WETO ;1024 WORDS TO MEM
000130* 000232* 0112767 004300 177660 MOV #2048,INTR ;2048. INTERRUPTS
000131* 000240* 004767 000752 JSR PC,STR1 ;GO INITIALIZE MODULE VARIABLES
000132* 000241* ;ROUTINE TO CLEAR DEVICE AND DATA TABLES (32 BYTES TOTAL)
000133* 000244* 0112767 000426* 15: MOV #DEVTAB,PC ;INITIALIZE TABLE POINTER
000134* 000250* 0115029 000466* CLD (R1)+ ;CLEAR THE TABLE
000135* 000256* 001374 CMP R0,#DEVTAB+40 ;RR IF NOT FINISHED 32 BYTES
000136* 000257* ;ROUTINE TO DETERMINE DEVICES TO BE TESTED AND SET UP VECTORS
000137* 000260* 0116700 177530 ST1: MOV DVID1,R0 ;GET DEVICE SELECTION PARAMETERS
000138* 000261* 0114103 000000 BNE 15 ;RR IF ANY SELECTED FOR TEST
000139* 000262* 0114103 ENDS,REGIN ;SET UP R1, R0 TO START AT ZERO
000140* 000272* 0005001 15: CLR R1
000141* 000273* 0021011 COM R1
000142* 000274* 0021011 CLR R2
000143* 000275* 0021011 COM R2
000144* 000276* 0116752 177502 MOV VECTOR,R3 ;START AT BEGINNING OF VECTOR AREA
000145* 000277* 0014466 MOV #JSRTAB,R4 ;START AT BEGINNING OF JSRTABLE
000146* 000278* 005201 INC R1 ;COUNT THE DEVICE
000147* 000279* 0062006 ASR P0 ;SHIFT SELECT BIT INTO "C"
000148* 000280* 0103410 BCS 45 ;GO SET IT UP
000149* 000281* 0052763 0000024 ADD #4,P3 ;UPDATE THE VECTOR AND JSRTAB PTRS.
000150* 000282* 0052763 0000017 35: ADD #6,R4
000151* 000283* 0022701 CMP #7,R1 ;LAST POSSIBLE DEVICE?
000152* 000284* 001366 BNE 25 ;BR IF NOT
000153* 000285* 001407 BR 55 ;GO START UP ALL ACTIVE DEVICES
000154* 000286* 0116752 177444 MOV R1,(R3)+ ;LOAD TINTR POINTER IN VECTOR
000155* 000287* 0014073 177444 INC R1 ;LOAD PRIORITY LEVEL IN VECTOR
000156* 000288* 0014073 000426* MOV R1,DEVTAB(R2) ;STORE ACTIVE DEVICE NO. IN
000157* 000289* 0014073 000426* BR 55 ;GO CHECK FOR END
000158* 000290* 0014073 000426* MOVB SPL,DATMSK ;SET UP PUNCH MASK
000159* 000291* 0014073 RR RESTRT ;START UP INTERRUPTS TO GO
000160* 000292* 0014073 ;ROUTINE TO INITIALLY START UP ALL ACTIVE DEVICES
000161* 000293* 010267 000724* 15: MOV R2,ACTDEV ;SAVE NO. OF ACTIVE DEVICES
000162* 000294* 010267 000426* MOVB DEVTAB(R2),R0 ;GET ACTIVE DEVICE NO.
000163* 000295* 0014073 ASL R0 ;GENERATE REG. OFFSET
000164* 000296* 0014073 ASL R0 ;GEN. CSR ADDRESS
000165* 000297* 0014073 ADD ADDR,R0

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SEQ 0008

293 000495- 000210 000100
294 000415- 000300 000100
295 000430- 000304 000000-
296 000422- 104400 000000-
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300 000426- 000010
301 000446- 000010
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306 000465- 004567 000134
307 000472- 000000 000126
308 000500- 000004 000120
309 000502- 004567 000120
310 000505- 000010 000112
311 000510- 004567 000112
312 000514- 004567 000104
313 000515- 004567 000104
314 000515- 004567 000076
315 000515- 004567 000076
316 000515- 004567 000076
317 000530- 004567 000070
318 000532- 004567 000070
319 000536- 004567 000062
320 000540- 004567 000062
321 000544- 000334 000054
322 000545- 004567 000054
323 000552- 004567 000046
324 000552- 004567 000046
325 000552- 004567 000040
326 000566- 000350 000040
327 000579- 004567 000032
328 000574- 000554 000032
329 000575- 004567 000024
330 000575- 004567 000024
331 000602- 000360 000016
332 000604- 004567 000016
333 000610- 000364 000016
334 000612- 004567 000010
335 000615- 000370 000010
336 000620- 004567 000002
337 000624- 000074 000002
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340 000626- 111577 000450
341 000632- 000527 000444
342 000636- 026727 000440 001340-
343 000644- 001003 000426
344 000646- 012767 001320- 000426
345 000654- 012765 15:
346 000654- 012765
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348 000655- 000004 000000-
349 000655- 000004 000000- 000664-
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353 000664- 005767 000424
354 000670- 104464 000406
355 000672- 117700 000406
356 000672- 110007 000400
357 000700- 000400 000400
358 000704- 0257423 000374 001340-
359 000714- 012767 001320- 000362
360 000722- 056700 177060 15:
361 000722- 056700 000344
362 000732- 065367 000344
363 000732- 065367 000344
364 000734- 005167 000354
365 000740- 104413 000354
366 000742- 104413 000354
367 000742- 104413 000000-
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369 000746- 105710 000332
370 000750- 100064 000332
371 000752- 012767 000762- 000332
372 000760- 006432 000332
373 000762- 104710 TER0:
374 000764- 104710 TSER0:
375 000765- 012767 000776- 000316
376 000774- 000424 TER1:
377 000775- 025201 TER1:
378 001000- 000272 TERR:
379 001002- 025767 TERR:
380 001008- 000415 TERR:
381 001014- 105261 000446- TERR:
382 001020- 116167 000446- 000346
383 001020- 116167 000446- 000346
384 001020- 116167 000446- 000346
385 001034- 116160 000234 000002
386 001042- 104400 TSER1:
387 001042- 104400 000000-
388
389 001046- 011067 177030 TERR:
390 001052- 010367 177022 MOV R0,CSRA
391 001056- 001077 000224 MOVR P1,TEQP1
392 001056- 001077 000224 INC TEQP1
393 001056- 023427 001360- 000212 CMP #TEQ+20,TEQP1
394 001056- 001066 BNE IS
395 001056- 001066 000212
396 001056- 001066 000212
397 001056- 001066 000212
398 001112- 104405 000000- 000000-
399 001112- 104405 000000- 000000-
400 001120- 117701 000164
401 001124- 005267 000160
402 001130- 022767 001360- 000152
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PABF DEC/X11 SYSTEM EXERCISE MODULE MACV11 30A(1052) 12-OCT-78 16:55 PAGE 11
XPABFO.P11 12-OCT-78 12:04

SEQ 0010

PABF DFC/X11 SYSTEM EXECUTER MODULE MACY11 3A(1052) 12-OCT-78 16:55 PAGE 13
XPABF0.P11 12-OCT-78 12:04 CROSS REFERENCE TABLE -- USER SYMBOLS

SE9 9911

PABF DEC/X11 SYSTEM EXERCISER MODULE MACY11 30A(1052) 12-OCT-78 16:55 PAGE 14
XPABFO.P11 12-OCT-78 12:04 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0012

INTR	000120R	235*	248*
JSRJAB	00046ER	269	306*
MOD2AS	= 000060P	244*	
MOD4SM	= 000020P	194*	
MODSP	= 000224R	204*	242*
MSGRC	= 104403	244*	
MSGCS	= 104402	244*	
MSGS	= 104401	244*	
NULP	= 000000	244*	
OPEN	= 000000	399	
		191	
OPOAS	= 000440P	244*	
PATSET	= 000074P	205*	
PTR03	= 000074	244*	
POPS0	= 0005726	244*	
POPS02	= 002626	244*	
PRTY	= 000060	195	
PRTY1	= 000050	244*	244*
PRTY2	= 000100	244*	
PRTY3	= 000140	244*	
PRTY4	= 000200	194	
PRTY5	= 000240	244*	
PRTY6	= 000300	244*	
PRTY7	= 000360	244*	
PSL	= 177776	244*	
PSM	= 177776	244*	
PUSH	= 005746	244*	
PUSH2	= 0014545	244*	
OPTR2	= 001302P	341*	342*
OPTR2	= 001304P	355	343
RANDM	= 104417	244*	360*
RANDM	= 000054P	244*	426*
RESTART	= 000056R	213*	427*
RESS3	= 000065P	232*	441*
RESTRT	= 000163P	215*	442*
SBADR	= 0001729	245*	
SOFCNT	= 0004229	225*	
SOFERS	= 104406	209*	
SOFPAS	= 000460P	244*	
SPOINT	= 00032P	210*	
SPS17	= 000049	214*	
SRI1	= 000016P	18	237
SR2	= 000020P	197*	283
SR3	= 000022P	198*	
SR4	= 000024P	199*	
START	= 000014P	201*	
STAT	= 000056P	202*	
STRT1	= 0001216R	203*	
ST1	= 000261P	249	
SVR0	= 000062P	211*	
SVR1	= 000064P	212*	
SVR2	= 000065P	213*	
SVR3	= 0000710	214*	

PABF DEC/X11 SYSTEM EXERCISE MODULE MACY11 3GA(1C52) 12-OCT-78 16:55 PAGE 15
XPABFO.P11 12-OCT-78 12:04 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0013

	CROSS REFERENCE TABLE - NUMBER DICTIONARY									
	1	2	3	4	5	6	7	8	9	10
SVR4	000072P	221#								
SVRS	000074R	222#								
SVR6	000076P	223#								
SYSCNT	000052P	212#								
TEQ	000134P	363	395	403	405	428	429	449*		
TEQP1	000136P	391*	392*	393	395*	428*	443*			
TEQP2	000131P	471	402*	403	405*	429*	444*			
TERO	000014P	75	271	292*						
TERI	000076P	274	375							
TINTR	000162P	376	308	371*	312	314	316	318	320	322
TQ	001323P	343	345	358	360	426	427	448*		
TRPDFFD	0006632	244#								
TSERV	000664P	443		353*						
TSER1	0001342R	354	390	386#						
VECTOR	000010P	193#	268							
WASADR	000114P	227#								
WDFR	000116P	234#								
WDTO	000114P	233#	247*							
XFLAG	0000658									
*	= 0013609	301#	448#	449#						

• ABS. 800000 881367 381

ERRORS DETECTED: 0
SEEKING GLOBALS: SEARCHED: 0

DEFINITION GLOBALS GENERATED: 0

XPARFC/XPARFC/SOL/CPF: SYN
RUN-TIME: 11.2 SECONDS

RUN-TIME RATIO: 19/3 = 5.8

CURE USED: IR (13 PAGES)

DIAGNOSTIC ENGINEERING

digitalDECO DEPO SUBMISSION FOR RELEASE ENG. USE
 NEW CHANGE DELETE

PRODUCT IDENTIFICATION										
MD	LIBRARY	PRODUCT NUMBER	REV	PATCH	ECO TALLY	PRODUCT DATE	STATUS	DISTRIBUTION	1ST COPY - RIGHT YEAR	LAST COPY - RIGHT YEAR
	ZZ	CXPAB	F	1	01	DD MMM YY	3 APR 79	OBSOLETE	X G R	1973

TITLE CXPABF/ PA611 PUNCH MODULE

AUTHOR D. BUTENHOF MAINTAINING GROUP DEC/X11 SPT GP MAINTAINER D. BUTENHOF SUBMITTING ENGINEER D. BUTENHOF

PRODUCT COMPONENTS

CK	DESCRIPTION	PRODUCT NO.	REV	CK	DESCRIPTION	PRODUCT NO.	REV
	DOCUMENT				INDEX		
	LISTING				SOURCE MEDIA		
	OBJECT MEDIA				TEST MEDIA		
X	DECO	AF-E857F-M1					

PRODUCTS OBSOLETED (other than previous version)

LIBRARY	PRODUCT NUMBER	REV	LIBRARY	PRODUCT NUMBER	REV	LIBRARY	PRODUCT NUMBER	REV
MD		M D				M D		

PRODUCT CHARACTERISTICS

PROCESSORS PRODUCT OPERATES WITH (Enter all applicable 2-digit codes representing the Processor the product operates with. See separate instructions.)

OPERATIONAL CODES (Enter all applicable 2-digit codes that describe the product. See separate instructions.)

ACT/APT/XXDP	EXT	ACT SEQ NUMBER	ACT/XXDP COMPATIBLE?	APT COMPATIBLE?	1ST PASS RUN TIME	SUBSEQUENT PASS RUN TIME
INFORMATION FIELD			Y <input type="checkbox"/> N	Y <input type="checkbox"/> N	SECONDS	SECONDS

DECO/DEPO INFORMATION

PROBLEM REPORTS CLOSED:	DEVICE AFFECTED	DEC/X11	MULTIMEDIA AFFECTED?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
KIT NUMBERS	ZJ129-RZ, FR	ZJ215-FR	ZJ239-RZ, PB	ZJ240-RB, RE	ZJ240-FR
	ZJ215-RY, RZ	ZJ239-RB, RY	ZJ239-FR	ZJ240-RZ	PB

PROBLEM:

Unable to handle multiple devices correctly

SOLUTION:

WITH THE FOLLOWING PATCH, WILL HANDLE ONLY ONE DEVICE

DEPO PATCH AREA

CHANGE LOC	FROM	TO	CHANGE LOC	FROM	TO
366	10267	12700	420	100	240
370	724	172700			
372	116200	5010			
374	426	240			
376	6300	240			
400	6300	240			
402	66700	240			
404	177400	240			

SUBMITTING ENGINEER	MANUFACTURING ENGINEER	SUPPORT ENGINEER	CHARGE DECO/DEPO TO DISCRETE PROJECT NUMBER
D. Butenhof	J. M. Caw		
DATE: 13 APR 79	DATE: 25 APR-79	DATE:	Q98-05460
MAINTAINER	FIELD SERVICE	WAIVERING MANAGER	COORDINATION NO.
D. Butenhof			3064
	DATE:	DATE:	