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IDENTIFICATION

PRODUCT CODE: AC-T885A-MC
PRODUCT TITLE: CXIEBA0 IEC11-A DEC/X11 MODULE
PRODUCT DATE: JANUARY 1984
DEPARTMENT: CSS, NASHUA
AUTHOR: DON MACOMBER

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DOCUMENT

1 A B S T R A C T

IEB IS AN IOMOD WHICH EXERCISES THE IEC11-A IEC BUS CONTROLLER. IT EXERCISES THE IEC11-A BY DOING DATA TRANSFERS WITH INTERRUPT, AND BY DOING A RANDOM TALKER AND LISTENER DATA TEST. ALL ERRORS DETECTED ARE REPORTED ON THE CONSOLE TTY.

2 R E Q U I R E M E N T S

HARDWARE:

- A. PDP11 CAPABLE OF SUPPORTING DEC/X11.
- B. IEC11-A IEC BUS CONTROLLER (M7985).
- C. ANY USER IEC BUS DEVICES MUST BE DISCONNECTED.
- D. THE IEC BUS DEVICE ADDRESS MUST BE SET TO 35(8).

SOFTWARE:

DEC/X11 MONITOR, VERSION 6.

STORAGE:

- 1. DECIMAL WORDS: 1016
- 2. OCTAL WORDS: 1770
- 3. OCTAL BYTES: 3760

3 P A S S D E F I N I T I O N

TEN PASS OF THE IEB MODULE CONSISTS OF TEN CYCLES OF THE TEST.

4 E X E C U T I O N T I M E

ONE PASS OF IEB RUNNING ALONE ON A PDP-11/34 TAKES APPROXIMATELY 40 SECONDS.

5 C O N F I G U R A T I O N R E Q U I R E M E N T S

DEFAULT PARAMETERS:

DEVADR: 160010, VECTOR: 270, BR1: 6, DEVCNT: 1

REQUIRED PARAMETERS:

NONE

E1

- 10 S T A R T I N G P R O C E D U R E

- A. LOAD AND START THE DEC/X11 PROGRAM ACCORDING TO
 THE DEC/X11 USER'S MANUAL (AC-82340-MC).
- B. ENSURE THAT THE DEVICE ADDRESS AND VECTOR ADDRESS
 ARE CORRECT FOR THE IEC11-A BUS CONTROLLER.

- 11 L I S T I N G

179
180
181 000000
000000

.SHTTL DDXCOM HEADER

IOMOD <IEBA >,160010,270,6,0,0,10,,0
MODULE 140000,IEBA ,160010,270,6,0,0,10,,0,,,,
.TITLE IEBA DEC/X11 SYSTEM EXERCISER MODULE
; DDXCOM VERSION 6.4 28-JAN-82
.LIST BIN

000000
000000 111 105
000003 101 040
000005 000
000006 160010
000010 000270
000012 300
000013 000
000014 000001
000016 000000
000020 000000
000022 000000
000024 000000

102

BEGIN:
MODNAM: .ASCII /IEBA / ;MODULE NAME.

XFLAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
ADDR: 160010+0 ;1ST DEVICE ADDR.
VECTOR: 270+0 ;1ST DEVICE VECTOR.
BR1: .BYTE PRTY6+0 ;1ST BR LEVEL.
BR2: .BYTE PRTY0+0 ;2ND BR LEVEL.
DVID1: 0+1 ;DEVICE INDICATOR 1.
SR1: OPEN ;SWITCH REGISTER 1
SR2: OPEN ;SWITCH REGISTER 2
SR3: OPEN ;SWITCH REGISTER 3
SR4: OPEN ;SWITCH REGISTER 4

000026 140000
000030 000224
000032 000224
000034 000000
000036 000012
000040 000000
000042 000000
000044 000000
000046 000000
000050 000000
000052 000000
000054 000000
000056 000000
000060 000000
000062 000000
000064 000000
000066 000000
000070 000000
000072 000000
000074 000000
000076 000000
000100 000000
000102 000000
000104 000000
000104 000000
000106 000000
000106 000000
000110 000000
000112 000224
000114 000000
000116 000000
000120 000000
000122 000000

STAT: 140000 ;STATUS WORD.
INIT: START ;MODULE START ADDR.
SPOINT: MODSP ;MODULE STACK POINTER.
PASCNT: 0 ;PASS COUNTER.
ICONT: 10. ;# OF ITERATIONS PER PASS=10.
ICOUNT: 0 ;LOC TO COUNT ITERATIONS
SOFCNT: 0 ;LOC TO SAVE TOTAL SOFT ERRORS
HADCNT: 0 ;LOC TO SAVE TOTAL HARD ERRORS
SOPPAS: 0 ;LOC TO SAVE SOFT ERRORS PER PASS
HARDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS
SYSCNT: 0 ;# OF SYS ERRORS ACCUMULATED
RANUM: 0 ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
CONFIG: ;RESERVED FOR MONITOR USE
RES1: 0 ;RESERVED FOR MONITOR USE
RES2: 0 ;RESERVED FOR MONITOR USE
SVR0: OPEN ;LOC TO SAVE R0.
SVR1: OPEN ;LOC TO SAVE R1.
SVR2: OPEN ;LOC TO SAVE R2.
SVR3: OPEN ;LOC TO SAVE R3.
SVR4: OPEN ;LOC TO SAVE R4.
SVR5: OPEN ;LOC TO SAVE R5.
SVR6: OPEN ;LOC TO SAVE R6.
CSRA: OPEN ;ADDR OF CURRENT CSR.
SBADR: ;ADDR OF GOOD DATA, OR
ACSR: OPEN ;CONTENTS OF CSR.
WASADR: ;ADDR OF BAD DATA, OR
ASTAT: OPEN ;STATUS REG CONTENTS.
ERRTYP: ;TYPE OF ERROR
ASB: OPEN ;EXPECTED DATA.
AWAS: OPEN ;ACTUAL DATA.
RSTR: RSTART ;RESTART ADDRESS AFTER END OF PASS
WDTO: OPEN ;WORDS TO MEMORY PER ITERATION
WDFR: OPEN ;WORDS FROM MEMORY PER ITERATION
INTR: OPEN ;# OF INTERRUPTS PER ITERATION
IDNUM: 0 ;MODULE IDENTIFICATION NUMBER=0

G1

C00040

.REPT SPSIZ
.NLIST
.WORD 0
.LIST
.ENDR

;MODULE STACK STARTS HERE.

000224

MODSP:

MACRO DEFINITIONS.

```

184      .SBTTL  MACRO DEFINITIONS.
185
186      .MACRO  SET,SACS
187      BIS     @SACS,CIR(R5)
188      .ENDM   SET,SACS
189
190      .MACRO  SET,LASTBYTE
191      BIS     @LASTBYTE,CIR(R5)
192      .ENDM   SET,LASTBYTE
193
194      .MACRO  SET,MC
195      BIS     @MC,CIR(R5)
196      .ENDM   SET,MC
197
198      .MACRO  SET,INTENB
199      BIS     @INTENB,CIR(R5)
200      .ENDM   SET,INTENB
201
202      .MACRO  SET,CA
203      BIS     @TCA,SMR(R5)
204      .ENDM   SET,CA
205
206      .MACRO  SET,CS
207      BIS     @TCS,SMR(R5)
208      .ENDM   SET,CS
209
210      .MACRO  SET,GTS
211      BIS     @GTS,SMR(R5)
212      .ENDM   SET,GTS
213
214      .MACRO  SET,SIC
215      BIS     @SIC,SMR(R5)
216      .ENDM   SET,SIC
217
218      .MACRO  CLR,STATECHGE
219      BIC     @STATECHGE,CIR(R5)
220      .ENDM   CLR,STATECHGE
221
222      .MACRO  CLR,DATAACC
223      BIC     @DATAACC,CIR(R5)
224      .ENDM   CLR,DATAACC
225
226      .MACRO  TST,0  ABIT,REG,GOIF0
227      BIT     @ABIT,REG(R5)
228
229      BEQ     GOIF0                                ; ABIT CLEAR IN REG ?
230
231      .ENDM   TST,0                                ; YES.
232
233
234      .MACRO  TST,1  ABIT,REG,GOIF1
235      BIT     @ABIT,REG(R5)
236
237      BNE     GOIF1                                ; ABIT SET IN REG ?
238
239      .ENDM   TST,1                                ; YES.
240
240      .MACRO  DELAY  TIME,PLS

```

MACRO DEFINITIONS.

```

241      MOV      @TIME,DELCNT          ; DELAY ( TIME US ).
242      L$:     BREAK                    ; BREAK TO MONITOR.
243      DEC      DELCNT                ; TIMEOUT?
244      BNE     L$                     ; NO.
245      ;                                     ; YES.
246      .ENDM   DELAY
247
248      .MACRO  WAIT.0  TIME,ABIT,REG,GOIFO,?L$
249      MOV      @TIME,DELCNT          ; WAIT ( TIME US ) FOR ABIT = 0.
250      L$:     BIT      @ABIT,REG(R5)
251      ;                                     ; BIT ABIT = 0?
252      BEQ     GOIFO                    ; YES.
253      BREAK                    ; NO. BREAK TO MONITOR.
254      DEC      DELCNT                ; TIMEOUT?
255      BNE     L$                     ; NO.
256      ;                                     ; YES.
257      .ENDM   WAIT.0
258
259      .MACRO  WAIT.1  TIME,ABIT,REG,GOIF1,?L$
260      MOV      @TIME,DELCNT          ; WAIT ( TIME US ) FOR ABIT = 1.
261      L$:     BIT      @ABIT,REG(R5)
262      ;                                     ; BIT ABIT = 1?
263      BNE     GOIF1                    ; YES.
264      BREAK                    ; NO. BREAK TO MONITOR.
265      DEC      DELCNT                ; TIMEOUT?
266      BNE     L$                     ; NO.
267      ;                                     ; YES.
268      .ENDM   WAIT.1
269
270      .MACRO  WAIT.INT
271      MOV      R5,SVR5                ; SAVE CONTENTS OF R5.
272      EXIT                    ; WAIT FOR INTERRUPT - EXIT TO MONITOR.
273
274      .ENDM   WAIT.INT
275
276      .MACRO  ERROR  XREF,ECODE
277      JSR     PC,ESETUP                ; SET UP FOR ERROR CALL.
278      MOV     @ECODE,ERRTYP            ; SET ERROR CODE TYPE.
279      MSGN   MSG'XREF'                 ; X-REF ERR CODE & DESCRIPTIVE MSG.
280      HRDER  REGTAB                    ; CALL ERROR, PRINT ALL REGS.
281      NOP
282      NOP
283      .ENDM   ERROR
284
285      .MACRO  SCOPE
286      NOP
287      NOP
288      .ENDM   SCOPE

```

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291          .SBTTL  EQUATES
292
293          ;**
294          ; DEVICE REGISTERS AND BIT DEFINITIONS.
295          ;**
296
297          000000  CIR=    0      ; CONTROL & INTERRUPT REGISTER.
298          000001  SACS=    BIT0   ; SYSTEM CONTROL ACTIVE STATE.
299          000004  LASTBYTE= BIT2   ; LAST BYTE.
300          000040  MC=      BIT5   ; MASTER CLEAR.
301          000100  INTENB=  BIT6   ; INTERRUPT ENABLE.
302          000400  STATECHG= BIT8   ; STATE CHANGE.
303          010000  ILLMSG=  BIT12  ; ILLEGAL MESSAGE.
304          020000  END=    BIT13  ; END OF BLOCK.
305          100000  DATAACC= BIT15 ; DATA ACCEPTED.
306
307          000002  SMR=    2      ; STATE & MESSAGE REGISTER.
308          000002  TCA=    BIT1   ; TAKE CONTROL ASYNCHRONOUSLY.
309          000001  TCS=    BIT0   ; TAKE CONTROL SYNCHRONOUSLY.
310          000004  GTS=    BIT2   ; GO TO STANDBY.
311          000100  SIC=    BIT6   ; SEND INTERFACE CLEAR.
312          000400  CACS=    BIT8   ; CONTROLLER ACTIVE STATE.
313          001000  CSBS=    BIT9   ; CONTROLLER STANDBY STATE.
314          010000  LACS=    BIT12  ; LISTENER ACTIVE STATE.
315          020000  SIAS=    BIT13  ; INTERFACE CLEAR ACTIVE STATE.
316
317          000004  IOR=    4      ; INPUT & OUTPUT REGISTER.
318
319          000006  VSR=    6      ; VECTOR SWITCH REGISTER.
320
321          ;**
322          ; GENERAL EQUATES.
323          ;**
324
325          177777  ALL=    177777 ; ALL BITS (BITS 15-0).
326          000377  LOBYTE= 377   ; LO ORDER BITS (BITS 7-0).
327          177400  HIBYTE= 177400 ; HI ORDER BITS (BITS 15-8).

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000402 104407 000000' BREAK$,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
000406 005367 001620 DEC DELCNT ; TIMEOUT?
000412 001371 BNE 66$ ; NO.
; YES.
; TAKE CONTROL SYNCR.
365 000414 SET.CS
000414 052765 000001 000002 BIS #TCS,SMR(R5)
366 000422 WAIT.1 100,ILLMSGE,CIR,T2 ;
000422 012757 000100 001602 MOV #100,DELCNT ; WAIT ( 100 US ) FOR ILLMSGE = 1.
000430 0327 5 010000 000000 67$: BIT #ILLMSGE,CIR(R5)
; BIT ILLMSGE = 1?
; YES.
; NO. BREAK TO MONITOR.
000436 001024 BNE T2 ;
000440 BREAK ;
000440 104407 000000' BREAK$,BEGIN ;TEMPORARY RETURN TO MONITOR....
000444 104407 000000' BREAK$,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
000450 005367 001556 DEC DELCNT ; TIMEOUT?
000454 001365 BNE 67$ ; NO.
; YES.
; NO ILLEGAL MESSAGE.
367 000456 ERROR 46,25 ; SET UP FOR ERROR CALL.
000456 004767 001500 JSR PC,ESETUP ; SET ERROR CODE TYPE.
000462 012767 000025 177416 MOV #25,ERRTP ; X-REF ERR CODE & DESCRIPTIVE MSG.
000470 104403 000000' 002266' MSGN$,BEGIN,MSG46 ;ASCII MESSAGE CALL WITH COMMON HEADER
000476 HRDR REGTAB ; CALL ERROR, PRINT ALL REGS.
;*****
000476 104405 000000' 002252' HRDR$,BEGIN,REGTAB ;
;*****
000504 000240 NOP
000506 000240 NOP
368
369 000510 T2:
370 000510 042765 177400 000000 BIC #HIBYTE,CIR(R5) ; CLEAR INTERUPT CONDITIONS.
371 000516 SET.CA ; TAKE CONTROL ASYNCR.
000516 052765 000002 000002 BIS #TCA,SMR(R5)
372 000524 DELAY 100 ; (GIVE STATECHGE & CACS TIME TO SET).
000524 012767 000100 001500 MOV #100,DELCNT ; DELAY ( 100 US ).
000532 BREAK ; BREAK TO MONITOR.
000532 104407 000000' BREAK$,BEGIN ;TEMPORARY RETURN TO MONITOR....
000536 104407 000000' BREAK$,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
000542 005367 001464 DEC DELCNT ; TIMEOUT?
000546 001371 BNE 64$ ; NO.
; YES.
373 000550 SCOPE
000550 000240 NOP
000552 000240 NOP
374 000554 042765 177400 000000 BIC #HIBYTE,CIR(R5) ; CLEAR INTERUPT BITS.
375 000562 012767 000646' 001450 MOV #T3,IRTN ; SET UP INTERUPT RETURN ADDRESS.
376 000570 SET.INTENB ; ENABLE INTERUPT.
000570 052765 000100 000000 BIS #INTENB,CIR(R5)
377 000576 116765 001440 000004 MOV# LIS1NR,IQR(R5) ; SEND LISTENER ADDRESS.
378 000604 WAIT.INT
000604 010567 177264 MOV R5,SVR5 ; SAVE CONTENTS OF R5.
000610 EXIT ; WAIT FOR INTERUPT - EXIT TO MONITOR.
000610 104400 000000' EXIT$,BEGIN ;EXIT TO MONITOR, MODULE WAIT FOR INTERRUPT.
379 000614 ERROR 50,23 ; NO INTERRUPT TO LISTENER ADDRESSING.
000614 004767 001342 JSR PC,ESETUP ; SET UP FOR ERROR CALL.
000620 012767 000023 177260 MOV #23,ERRTP ; SET ERROR CODE TYPE.

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000626				MSGN	MSG50				; X-REF ERR CODE & DESCRIPTIVE MSG.
000626	104403	000000'	002272'	MSGN\$,BEGIN,MSG50					;ASCII MESSAGE CALL WITH COMMON HEADLR
000634				HRDR	REGTAB				; CALL ERROR, PRINT ALL REGS.
				;*****					
000634	104405	000000'	002252'	HRDR\$,BEGIN,REGTAB					;*****
				;*****					
000642	000240			NOP					
000644	000240			NOP					
380									
381	000646								
382	000646								
383	000646								
	000646	000240							
	000650	000240							
384	000652	042765	177400	000000	BIC	0HIBYTE,CIR(R5)			; CLEAR INTERRUPT BITS.
385	000660	012767	000744'	001352	MOV	0T5,IRTN			; SET UP INTERRUPT RETURN ADDRESS.
386	000666				SET	INTENB			; ENABLE INTERRUPT.
	000666	052765	000100	000000	BIS	0INTENB,CIR(R5)			
387	000674	116765	001344	000004	MOVB	TALKER,IO(R5)			; ADDRESS TALKER AGAIN.
388	000702				WAIT	INT			
	000702	010567	177166		MOV	R5,SVRS			; SAVE CONTENTS OF R5.
	000706				EXIT				; WAIT FOR INTERRUPT - EXIT TO MONITOR.
	000706	104400	000000'		EXIT\$,BEGIN				;EXIT TO MONITOR, MODULE WAIT FOR INTERRUPT.
389	000712				ERROR	53,23			; NO INTERRUPT TO TALKER ADDRESSING.
	000712	004767	001244		JSR	PC,ESETUP			; SET UP FOR ERROR CALL.
	000716	012767	000023	177162	MOV	023,ERRTYP			; SET ERROR CODE TYPE.
	000724				MSGN	MSG53			; X-REF ERR CODE & DESCRIPTIVE MSG.
	000724	104403	000000'	002302'	MSGN\$,BEGIN,MSG53				;ASCII MESSAGE CALL WITH COMMON HEADER
	000732				HRDR	REGTAB			; CALL ERROR, PRINT ALL REGS.
					;*****				
	000732	104405	000000'	002252'	HRDR\$,BEGIN,REGTAB				;*****
					;*****				
	000740	000240			NOP				
	000742	000240			NOP				
390									
391	000744								
392	000744								
393	000752	052765	000004	000002	SET	GTS			; GO TO STANDBY STATE.
	000752	012767	000100	001252	BIS	0GTS,SMR(R5)			; (GIVE CSBS TIME TO SET).
	000760				DELAY	100			; DELAY (100 US).
	000760	104407	000000'		MOV	0100,DELCNT			; BREAK TO MONITOR.
	000764	104407	000000'		BREAK				; TEMPORARY RETURN TO MONITOR...
	000770	005367	001236		BREAK\$,BEGIN				; THEN CONTINUE AT NEXT INSTRUCTION.
	000774	001371			BREAK\$,BEGIN				
					DEC	DELCNT			; TIMEOUT?
					BNE	64\$; NO.
									; YES.
394	000776				TST	1 LACS,SMR,T6			; LACS SET IN SMR ?
	000776	032765	010000	000002	BIT	0LACS,SMR(R5)			; YES.
									; NO.
	001004	001015			BNE	T6			; NO LACS.
395	001006				ERROR	52,25			; SET UP FOR ERROR CALL.
	001006	004767	001150		JSR	PC,ESETUP			; SET ERROR CODE TYPE.
	001012	012767	000025	177066	MOV	025,ERRTYP			; X-REF ERR CODE & DESCRIPTIVE MSG.
	001020				MSGN	MSG52			;ASCII MESSAGE CALL WITH COMMON HEADER
	001020	104403	000000'	002276'	MSGN\$,BEGIN,MSG52				

T3:
T4:

T5:

64\$:

```

001026                                HRDER  REGTAB                                ; CALL ERROR, PRINT ALL REGS.
;*****
001026 104405 000000' 002252'        HRDER$,BEGIN,REGTAB                                ;
;*****
001034 000240                                NOP
001036 000240                                NOP
396
397 001040                                T6:
398 001040 112765 177777 000004        MOVB   #ALL,IOR(R5)                                ; SEND A DATA BYTE.
399 001046 012767 000100 001156        DELAY  100                                        ; ( GIVE DATAACC TIME TO SET).
001046 012767 000100 001156        MOV    #100,DELCNT                                ; DELAY ( 100 US ).
001054                                64$:
001054 104407 000000'                                BREAK                                     ; BREAK TO MONITGR.
001054 104407 000000'                                BREAK$,BEGIN                                ; TEMPORARY RETURN TO MONITOR....
001060 104407 000000'                                BREAK$,BEGIN                                ; THEN CONTINUE AT NEXT INSTRUCTION.
001064 005367 001142                                DEC    DELCNT                                    ; TIMEOUT?
001070 001371                                BNE   64$                                        ; NO.
; YES.
; CLEAR DATA ACCEPTED.
400 001072                                CLR.DATAACC
001072 042765 100000 000000        BIC    #DATAACC,CIR(R5)
401 001100                                CLR.STATECHGE
001100 042765 000400 000000        BIC    #STATECHGE,CIR(R5)                                ; CLEAR STATE CHANGE.
402 001106 105365 000004                                DECB   IOR(R5)                                    ; SEND NEXT DATA BYTE.
403 001112                                65$:
001112 012767 000100 001112        DELAY  100                                        ; DELAY ( 100 US ).
001120                                BREAK                                     ; BREAK TO MONITOR.
001120 104407 000000'                                BREAK$,BEGIN                                ; TEMPORARY RETURN TO MONITOR....
001124 104407 000000'                                BREAK$,BEGIN                                ; THEN CONTINUE AT NEXT INSTRUCTION.
001130 005367 001076                                DEC    DELCNT                                    ; TIMEOUT?
001134 001371                                BNE   65$                                        ; NO.
; YES.
404 001136                                TST.O  DATAACC,CIR,T7
001136 032765 100000 000000        BIT    #DATAACC,CIR(R5)
; DATAACC CLEAR IN CIR ?
001144 001415                                BEQ    T7                                        ; YES.
; NO.
405 001146                                ERROR  54,44                                    ; DATA ACCEPTED TO SECOND DATA BYTE.
001146 004767 001010                                JSR   PC,ESETUP                                ; SET UP FOR ERROR CALL.
001152 012767 000044 176726        MOV    #44,ERRTYP                                ; SET ERROR CODE TYPE.
001160                                MSGN   MSG54                                    ; X-REF ERR CODE & DESCRIPTIVE MSG.
001160 104403 000000' 002306'        MSGN$,BEGIN,MSG54                                ; ASCII MESSAGE CALL WITH COMMON HEADER
001166                                HRDEP  REGTAB                                    ; CALL ERROR, PRINT ALL REGS.
;*****
001166 104405 000000' 002252'        HRDER$,BEGIN,REGTAB                                ;
;*****
001174 000240                                NOP
001176 000240                                NOP
406
407 001200                                T7:
408 001200 016567 000004 001042        MOV    IOR(R5),GOT                                ; GET IOR CONTENT.
409 001206 000367 001036                                SWAB  GOT
;
410 001212 126727 001032 000377        CMPB  GOT,#377                                    ; DATA OK?
411 001220 001417                                BEQ   T8                                        ; YES.
412 001222 000367 001022                                SWAB  GOT
; NO, REBUILD DATA PATTERN READ.
413 001226                                ERROR  55,1                                    ; DATA CHECK ON IEC TALKER OR LISTENER.
001226 004767 000730                                JSR   PC,ESETUP                                ; SET UP FOR ERROR CALL.
001232 012767 000001 176646        MOV    #1,ERRTYP                                ; SET ERROR CODE TYPE.
001240                                MSGN   MSG55                                    ; X-REF ERR CODE & DESCRIPTIVE MSG.

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```

001240 104403 000000' 002312' MSGN$,BEGIN,MSG55 ;ASCII MESSAGE CALL WITH COMMON HEADER
001246 HRDR REGTAB ; CALL ERROR, PRINT ALL REGS.
;*****
001246 104405 000000' 002252' HRDR$,BEGIN,REGTAB ;
;*****
001254 000240
001256 000240
NOP
NOP
414
415 001260 T8:
416 001260 TST.1 DATAACC,CIR,T9
001260 032765 100000 000000 BIT #DATAACC,CIR(R5)
; DATAACC SET IN CIR ?
; YES.
; NO.
; NO SECOND "DATA ACCEPTED".
; SET UP FOR ERROR CALL.
; SET ERROR CODE TYPE.
; X-REF ERR CODE & DESCRIPTIVE MSG.
001270 001270 004767 000666 ERROR 56,25
001274 012767 000025 176604 JSR PC,ESETUP
001302 MOV #25,ERRTYP
MSGN MSG56 ; X-REF ERR CODE & DESCRIPTIVE MSG.
001302 104403 000000' 002316' MSGN$,BEGIN,MSG56 ;ASCII MESSAGE CALL WITH COMMON HEADER
001310 HRDR REGTAB ; CALL ERROR, PRINT ALL REGS.
;*****
001310 104405 000000' 002252' HRDR$,BEGIN,REGTAB ;
;*****
001316 000240
001320 000240
NOP
NOP
418
419 001322 T9:
420 001322 016567 000004 000720 MOV IOR(R5),GOT ; GET SECOND DATA BYTE.
421 001330 000367 000714 SWAB GOT ;
422 001334 126727 000710 000376 CMPB GOT,#376 ; IS SECOND DATA BYTE OK?
423 001342 001417 BEQ T10 ; YES.
424 001344 000367 000700 SWAB GOT ; NO, REBUILD PATTERN READ.
425 001350 ERROR 57,1 ; DATA CHECK ON SECOND BYTE.
001350 004767 000606 JSR PC,ESETUP ; SET UP FOR ERROR CALL.
001354 012767 000001 176524 MOV #1,ERRTYP ; SET ERROR CODE TYPE.
001362 MSGN MSG57 ; X-REF ERR CODE & DESCRIPTIVE MSG.
001362 104403 000000' 002322' MSGN$,BEGIN,MSG57 ;ASCII MESSAGE CALL WITH COMMON HEADER
001370 HRDR REGTAB ; CALL ERROR, PRINT ALL REGS.
;*****
001370 104405 000000' 002252' HRDR$,BEGIN,REGTAB ;
;*****
001376 000240
001400 000240
NOP
NOP
426
427
428 ;**
429 ; RANDOM TALKER AND LISTENER DATA TEST.
430 ;
431 ; THIS TEST CAN NOT BE CALLED SEPARATELY, DUE TO THE NECESSARY.
432 ; SETUP TO BRING THE BUS INTO THIS STATE.
433 ;
434 ;**
435 001402 T10:
436 001402 005067 000626 CLR RANMOD ; DISABLE RANDOM MODE.
437 001406 005067 000634 CLR DATBUF ; CLEAR DATA BUFFER.
438 001412 042765 177400 000000 BIC #HIBYTE,CIR(R5) ; CLEAR INTERRUPT BITS.
439 001420 SCOPE

```

START RESTART TEST

```

001420 000240 NOP
001422 000240 NOP
440 001424 012767 001524' 000606 MOV #T12,IRTN ; SET INTERRUPT RETURN ADDRESS.
441 001432 012767 001000 000576 MOV #1000,LOOP ; INIT LOOP COUNTER.
442 001440 T11:
443 001440 042765 177400 000000 BIC #HIBYTE,CIR(R5) ; CLEAR INTERRUPT BITS.
444 001446 SET,INTENB ; ENABLE INTERRUPTS.
001446 052765 000100 000000 BIS #INTENB,CIR(R5)
445 001454 016765 000566 000004 MOV DATBUF,IOR(R5) ; SEND A DATA BYTE.
446 001462 WAIT,INT
001462 010567 176406 MOV R5,SVR5 ; SAVE CONTENTS OF R5.
001466 EXIT ; WAIT FOR INTERRUPT - EXIT TO MONITOR.
001466 104400 000000' EXIT$,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.

447 001472 ERROR 60,23 ; NO INTERRUPT TO DATA SENDING.
001472 004767 000464 JSR PC,ESETUP ; SET UP FOR ERROR CALL.
001476 012767 000023 176402 MOV #23,ERRTYP ; SET ERROR CODE TYPE.
001504 MSGN MSG60 ; X-REF ERR CODE & DESCRIPTIVE MSG.
001504 104403 000000' 002326' MSGN$,BEGIN,MSG60 ;ASCII MESSAGE CALL WITH COMMON HEADER
001512 HRDR REGTAB ; CALL ERROR, PRINT ALL REGS.
;*****
001512 104405 000000' 002252' HRDR$,BEGIN,REGTAB
;*****
001520 000240 NOP
001522 000240 NOP

448
449 001524 T12:
450 001524 T13:
451 001524 016567 000004 000516 MOV IOR(R5),GOT ; READ BACK DATA BYTE.
452 001532 105067 000512 CLR# GOT ; PREPARE DATA.
453 001536 000367 000506 SWAB GOT ;
454 001542 026767 000502 000476 CMP GOT,DATBUF ; DATA OK?
455 001550 001415 BEQ T14 ; YES.
456 001552 ERROR 62,1 ; DATA CHECK ON IEC BUS.
001552 004767 000404 JSR PC,ESETUP ; SET UP FOR ERROR CALL.
001556 012767 000001 176322 MOV #1,ERRTYP ; SET ERROR CODE TYPE.
001564 MSGN MSG62 ; X-REF ERR CODE & DESCRIPTIVE MSG.
001564 104403 000000' 002332' MSGN$,BEGIN,MSG62 ;ASCII MESSAGE CALL WITH COMMON HEADER
001572 HRDR REGTAB ; CALL ERROR, PRINT ALL REGS.
;*****
001572 104405 000000' 002252' HRDR$,BEGIN,REGTAB
;*****
001600 000240 NOP
001602 000240 NOP

457
458 001604 T14:
459 001604 005767 000424 TST RANMOD ; RANDOM MODE?
460 001610 001011 BNE T15 ; YES.
461 001612 005267 000430 INC DATBUF ; NO. BUILD NEXT DATA PATTERN.
462 001616 026727 000424 000400 CMP DATBUF,#400 ; ALL DATA (0-377) TRIED?
463 001624 001305 BNE T11 ; NO.
464 001626 012767 177777 000400 MOV #-1,RANMOD ; YES. SWITCH TO RANDOM MODE.
465 001634 T15:
466 001634 RAND ; GET A RANDOM NUMBER (PATTERN).
001634 104417 000000' RAND$,BEGIN
467 001640 016767 176210 000400 MOV RANNUM,DATBUF ; MOVE PATTERN ONTO STACK,
468 001646 042767 177400 000372 BIC #177400,DATBUF ; BUILD A BYTE.

```


E2

```

002100      MSGN      MSG65      ; X-REF ERR CODE & DESCRIPTIVE MSG.
002100 104403 000000' 002346'  MSGN$,BEGIN,MSG65      ;ASCII MESSAGE CALL WITH COMMON HEADER
002106      HRDR      REGTAB      ; CALL ERROR, PRINT ALL REGS.
;*****
002106 104405 000000' 002252'  HRDR$,BEGIN,REGTAB      ;
;*****
002114      NOP
002116      NOP
489
490 002120      TEND;
491 002120      SET,MC      ; MASTER CLEAR.
002120 052765 000040 000000  BIS      #MC,CIR(R5)
492 002126      ENDIT
002126 104413 000000'  ENDIT$,BEGIN      ;SIGNAL END OF ITERATION.
;MONITOR SHALL TEST END OF PASS
493 002132 000167 176066  JMP      RESTRT      ; RESTART NEXT ITERATION.

```

F2

```

496                                     .SBTTL  INTERUPT SERVICE ROUTINE
497
498 002136                               INTSVC: PIRQ   GOIRTN
      002136 000004 000000' 002144'      |-----|
      | PIRQ$,BEGIN,GOIRTN                | QUEUE UP TO CONTINUE AT GOIRTN AND RTI
      |-----|
499
500 002144 016705 175724                 GOIRTN: MOV    SVR5,R5                ; RESTORE R5.
501 002150 142765 177400 000000         BICB   0HIBYTE,CIR(R5)           ; CLEAR INTERUPT BITS.
502 002156 000177 000056                 JMP    0IRTN                    ; RETURN.

```

```

505
506
507
508
509
510
511 002162 010567 175712
512 002166 011567 175710
513 002172 010500
514 002174 010067 000052
515 002200 062700 000002
516 002204 010067 000044
517 002210 062700 000002
518 002214 010067 000036
519 002220 062700 000002
520 002224 010067 000030
521 002230 000207

```

```

      .SBTTL  SUBROUTINES
      ;++
      ; SUBROUTINE - SET UP FOR ERROR CALL.
      ;--
ESETUP: MOV      R5,CSRA          ; SET UP CSR (CIR) ADDRESS.
        MOV      (R5),ACSR      ; SET UP CSR (CIR) CONTENTS.
        MOV      R5,R0
        MOV      R0,CIRPTR     ; SET UP REG POINTERS IN TABLE.
        ADD      #2,R0
        MOV      R0,SMRPTR
        ADD      #2,R0
        MOV      R0,IORPTR
        ADD      #2,R0
        MOV      R0,VSRPTR
        RTS      PC

```

```

524                                     .SBTTL  CONSTANTS AND VARIABLES.
525
526 002232 000000                      DELCNT: 0                ; DELAY COUNTER.
527 002234 000000                      RANMOD: 0                ; RANDOM MODE (0=NOT RANDOM, -1=RANDOM)
528 002236 000000                      LOOP: 0                 ; LOOP COUNTER.
529 002240 000000                      IRTN: 0                 ; INTERRUPT RETURN ADDRESS.
530 002242 000075                      LISTNR: 75              ; ADDRESS OF LISTENER.
531 002244 000135                      TALKER: 135            ; ADDRESS OF TALKER.
532 002246 000000                      DATBUF: 0              ; DATA WORD OR BYTE BUFFER.
533 002250 000000                      GOT: 0                 ; DATA ACTUALLY GOTTEN.
534
535 002252                                REGTAB:                ; REGISTER POINTERS SAVED HERE FOR ERR DUMPING.
536 002252 000000                      CIRPTR: CIR            ; CIR POINTER (AFTER R5 ADDED IN).
537 002254 000002                      SMRPTR: SMR           ; SMR POINTER (AFTER R5 ADDED IN).
538 002256 000004                      IORPTR: IOR           ; IOR POINTER (AFTER R5 ADDED IN).
539 002260 000006                      VSRPTR: VSR           ; VSR POINTER (AFTER R5 ADDED IN).
540 002262 002246                      DBPTR: DATBUF         ; DATBUF (DATA BUFFER) POINTER.
541 002264 177777                      -1                    ; TABLE TERMINATOR.

```

```

547                                     .SBTTL  ASCII MESSAGES
548
549 002266 002352'      MSG46:  EMSG46
550 002270 177777      -1
551 002272 002426'      MSG50:  EMSG50
552 002274 177777      -1
553 002276 002527'      MSG52:  EMSG52
554 002300 177777      -1
555 002302 002630'      MSG53:  EMSG53
556 002304 177777      -1
557 002306 002704'      MSG54:  EMSG54
558 002310 177777      -1
559 002312 003041'      MSG55:  EMSG55
560 002314 177777      -1
561 002316 003136'      MSG56:  EMSG56
562 002320 177777      -1
563 002322 003271'      MSG57:  EMSG57
564 002324 177777      -1
565 002326 003367'      MSG60:  EMSG60
566 002330 177777      -1
567 002332 003464'      MSG62:  EMSG62
568 002334 177777      -1
569 002336 003552'      MSG63:  EMSG63
570 002340 177777      -1
571 002342 003646'      MSG64:  EMSG64
572 002344 177777      -1
573 002346 003710'      MSG65:  EMSG65
574 002350 177777      -1
575
576 002352      105      122      122  EMSG46: .ASCIZ 'ERROR 46 - "TCS" DOES NOT PRODUCE "ILLMSGE"'
577 002426      105      122      122  EMSG50: .ASCIZ 'ERROR 50 - WHEN SENDING THE LISTENER ADDRESS, NO INTERRUPT OCCURS'
578 002527      105      122      122  EMSG52: .ASCIZ 'ERROR 52 - AFTER LISTENER ADDRESSING AND "GTS", NO "LACS" IS SET'
579 002630      105      122      122  EMSG53: .ASCIZ 'ERROR 53 - NO INTERRUPT TO TALKER ADDRESSING'
580 002704      105      122      122  EMSG54: .ASCII 'ERROR 54 - WHEN SENDING A SECOND DATA BYTE BEFORE READING'
581 002775      045      124      110  .ASCIZ 'AT THE FIRST AGAIN, "DATAACC" CAME UP'
582 003041      105      122      122  EMSG55: .ASCIZ 'ERROR 55 - FIRST DATA BYTE SENT AND RECEIVED IS NOT THE SAME'
583 003136      105      122      122  EMSG56: .ASCII 'ERROR 56 - AFTER READING THE FIRST SENT DATA BYTE, THE SECOND SENT'
584 003240      045      104      111  .ASCIZ 'DID NOT BRING "DATAACC"'
585 003271      105      122      122  EMSG57: .ASCII? 'ERROR 57 - SECOND DATA BYTE SENT AND RECEIVED IS NOT THE SAME'
586 003367      105      122      122  EMSG60: .ASCIZ 'ERROR 60 - SENDING OF DATA BYTE DOES NOT PRODUCE AN INTERRUPT'
587 003464      105      122      122  EMSG62: .ASCIZ 'ERROR 62 - DATA BYTES SENT AND RECEIVED ARE NOT EQUAL'
588 003552      105      122      122  EMSG63: .ASCIZ 'ERROR 63 - NO "DATAACC" WHEN SENDING A BYTE WITH "LASTBYTE"'
589 003646      105      122      122  EMSG64: .ASCIZ 'ERROR 64 - NO "END" TO "LASTBYTE"'
590 003710      105      122      122  EMSG65: .ASCIZ 'ERROR 65 - DATA CHECK ON "LASTBYTE"'
591                                     .EVEN
592

```

J2

IEBA DEC/X11 SYSTEM EXERCISER M MACRO M1200 30-MAR-84 11:01 PAGE 23
END OF PROGRAM

SEQ 22

598			.JB TTL	END OF PROGRAM
599				
600	003754	055036	DDMMY:	23070.
601	003756	001750	HHMM:	1000.
602				
603	003760	000001	PEND:	.END

ACSR	000102R	DATER\$	104404	IOR	000004	POPSP	005726	SR4	000024R
ADDR	000006R	DBPTR	002262R	IORPTR	002256R	POPSP2	022626	START	000224R
ADDR2\$	001000	DCMY	003754R	IRTN	002240R	PRHMS\$	000002	STAT	000026R
ALL	177777	DELCNT	002232R	KTPRES	000400	PRTY	000000	STATEC	000400
APTPRE	000200	DVID1	000014R	KTXTND	040000	PRTY0	000000	SVR0	000062R
ASB	000106R	ECCMEM	000100	LACS	010000	PRTY1	000040	SVR1	000064R
ATAT	000104R	EMSG46	002352R	LASTBY	000004	PRTY2	000100	SVR2	000066R
AUTO	000010	EMSG50	002426R	LISINR	002242R	PRTY3	000140	SVR3	000070R
AWAS	000110R	EMSG52	002527R	LOBYTE	000377	PRTY4	000200	SVR4	000072R
BEGIN	000000R	EMSG53	002630R	LOOP	002236R	PRTY5	000240	SVR5	000074R
BIT0	000001	EMSG54	002704R	MAP22\$	104416	PRTY6	000300	SVR6	000076R
BIT1	000002	EMSG55	003041R	MC	000040	PRTY7	000340	SYSCNT	000052R
BIT10	002000	EMSG56	003136R	MODNAM	000000R	PS	177776	TALKER	002244R
BIT11	004000	EMSG57	003271R	MODSP	000224R	PSW	177776	TCA	000002
BIT12	010000	EMSG60	003367R	MSGN\$	104403	PUSH	005746	TCS	000001
BIT13	020000	EMSG62	003464R	MSG\$	104402	PUSH2	024646	TEND	002120R
BIT14	040000	EMSG63	003552R	MSG\$	104401	PWRFLG	000002	TRPDFD	000023
BIT15	100000	EMSG64	003646R	MSG46	002266R	QMON2	000010	TSTIEB	000250R
BIT2	000004	EMSG65	003710R	MSG50	002272R	RAND\$	104417	T1	000250R
BIT3	000010	END	020000	MSG52	002276R	RANMOD	002234R	T10	001402R
BIT4	000020	ENDIT\$	104413	MSG53	002302R	RANNUM	000054R	T11	001440R
BIT5	000040	END\$	104410	MSG54	002306R	REGTAB	002252R	T12	001524R
BIT6	000100	ERRTYP	000100R	MSG55	002312R	RESTR	000224R	T13	001524R
BIT7	000200	ESETUP	002162R	MSG56	002316R	RES1	000056R	T14	001604R
BIT8	000400	EXIT\$	104400	MSG57	002322R	RES2	000060R	T15	001634R
BIT9	001000	GETPA\$	104415	MSG60	002326R	RH70	001000	T16	001776R
BREAK\$	104407	GOIRTN	002144R	MSG62	002332R	RSTRT	000112R	T17	002040R
BR1	000012R	GOT	002250R	MSG63	002336R	R6	000006	T2	000510R
BR2	000013R	GTS	000004	MSG64	002342R	R7	000007	T3	000646R
BTOD\$	104421	GWBUF\$	104414	MSG65	002346R	SACS	000001	T4	000646R
CACS	000400	HMM	003756R	NCPUOP	000020	SBADR	000102R	T5	000744R
CAPRES	000004	LIBYTE	177400	NOPTY	000002	SIAS	020000	T6	001040R
CDATA\$	104412	HRDCNT	000044R	NULL	000000	SIC	000100	T7	001200R
CIR	000000	HRDR\$	104405	OPEN	000000	SMR	000002	T8	001260R
CIRPTR	002252R	HRDPAS	000050R	OTOA\$	104420	SMRPTR	002254R	T9	001322R
CKHNG\$	000001	ICONT	000036R	PARPRE	002000	SOFCNT	000042R	USTACK	000001
CLKPRE	000001	ICOUNT	000040R	PASCNT	000034R	SOFR\$	104406	VECTOR	000010R
CLKSP\$	104422	IDNUM	000122R	PDPF11	000002	SOFPAS	000046R	VSR	000006
CONFIG	000056R	ILLMSG	010000	PDPLSI	020000	SPOINT	000032R	VSRPTR	002260R
CSBS	001000	INDPAR	000040	PDP44	100000	SPSIZ	000040	WASADR	000104R
CSRA	000100R	INIT	000030R	PDP60	004000	SR1	000016R	WDFR	000116R
DATAAC	100000	INTENB	000100	PDP70	010000	SR2	000020R	WDT0	000114R
DATBUF	002246R	INTR	000120R	PEND	003760R	SR3	000022R	XFLAG	000005R
DATCK\$	104411	INTSVC	002136R	PIRQ\$	000004				

. ABS. 000000 000
 003760 001
 ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 14148 WORDS (56 PAGES)
 DYNAMIC MEMORY: 20060 WORDS (77 PAGES)
 ELAPSED TIME: 00:00.35
 XIEBAO,XIEBAO/-SP=DDXCOM.MAC,XIEBAO.MAC

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DOCUMENTC1
DOCUMENTD1
DOCUMENTE1
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DOXCOM HEADERG1
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MACRO DEFINITIONS.I1
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START - RESTART - TE....L1
START - RESTART - TE....M1
START - RESTART - TE....N1

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