

.REM -

IDENTIFICATION

PRODUCT CODE: AC-E869C-MC
PRODUCT NAME: CXICACO ICS-11 MODULE
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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MAIN DEC CHANGE NOTICE
MAY BE REQUIRED FOR
PROGRAM TO OPERATE

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1. ABSTRACT:-----

ICA IS AN IDMOD DESIGNED TO OUTPUT DATA TO THE UNUSED ICS-11 ADDRESS AND TO CAUSE THE ICS-11 TO INTERRUPT USING THE MAINTENANCE INTERRUPT FACILITIES.

2. REQUIREMENTS:-----

HARDWARE: ICS-11
STORAGE:: ICA REQUIRES:
1. DECIMAL WORDS: 171
2. OCTAL WORDS: 0253
3. OCTAL BYTES: 526

3. PASS DEFINITION:-----

ONE PASS IS DEFINED AS DOING 65,536 (DECIMAL) MAINTENANCE INTERRUPTS.

4. EXECUTION TIME:-----

ICA RUNNING ALONE TAKES APPROXIMATELY ONE MINUTE.

5. CONFIGURATION REQUIREMENTS:-----

REQUIRED PARAMETERS:

NONE

DEFAULT PARAMETERS:

ADDR: 771776 ADDRESS OF ICS-11-CONTROL REGISTER.
VECTOR: 234 ICS-11 INTERRUPT VECTOR.
BR1: 6 ICS-11 INTERRUPT PRIORITY.
BR2: 6

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

NONE

7. MODULE OPERATION:-----

- A. THE PROGRAM OUTPUTS MEMORY DATA TO THE UNUSED ICS-11 LOCATION. NO DATA CHECK IS MADE.
- B. THE ICS-11 IS PRIMED FOR A MAINTENANCE INTERRUPT BY SETTING THE MAINTENANCE BIT AND THE INTERRUPT ENABLE BIT IN THE CSR.

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C. ON INTERRUPT, A CHECK IS MADE TO SEE IF THE INTERRUPT
CAME AS A RESULT OF STEP "B" OR IF THE ICS-11 "RIF"
(RESET INTERRUPT FLAG SIGNAL). INTERRUPT CAUSED BY STEP
FUNCTION FAILED TO CLEAR THE SECOND CONDITION IS
B. AN ERROR IS GENERATED IF THE SECOND CONDITION IS
TRUE AND THE MODULE "RIF" IS TERMINATED.
D. THE PROGRAM ISSUES "RIF" TO THE ICS.
E. STEPS A-D ARE REPEATED 65,536 (DECIMAL) TIMES.
F. END PASS IS REPORTED.

8. OPERATING OPTIONS:

NONE

9. NON-STANDARD PRINTOUTS:

NONE

10. FLOW CHART

* START *
* RESTART *

;ICSR=CONTROL AND STATUS REGISTER
;ICAR=ADDRESS REGISTER

I *****
* FORM OF *
* ADDR. OF *
* ICAR. ICSR *

I *****
* XFER ADDR. *
* ADDR. OF *
* PATTERNS *

SENPAT I
/ / CALL \ YES \
/ / ENDIT \ /
-----> *****
*****ENDPAS *****

I NO *****

*TRANSFER 22 WORDS OF *
MEMORY DATA TO ICS-11
* UNUSED ADDRESS *****
***** I

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*****
* SET VECTOR.
* INTERRUPT "ICSINT"
* CLEAR "ICSINT"
*****
I *****
* SET MAINTENANCE
* AND INTERRUPT ENABLE
* AND BITS IN ICSR
*****
I *****
**EXIT**
*****

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;WHEN WE EXIT TO THE MONITOR
;AN INTERRUPT FROM THE ICS-11
;WILL TAKE US TO "ICSRT"

```

INTERRUPT BEGINS US HERE

```

*****
**ICSRT**
*****
I *****
* COMPLIMENT STATE
* OF FLAG
* "ICSINT"
*****
I

```

```

----- ICSINT \IVES -----
/ /
I NO
*****
* FORM ADDR ICS THAT
* INTERRUPTS BASED
* ON CONTENTS OF ICAR
*****
I *****
* ISSUE SIGNAL "RIF"
* TO ICS-11 TO CLEAR
* MAINT. BIT IN ICSR
*****
I *****
* PIRG
* (RETURN CONTROL
* TO MONITOR)
*****
I *****

```

```

*****
**DISABLE ICS-11 SETUP**
**FOR ERROR TYPEOUT AND**
**EXECUTE TYPEOUT**
*****
I *****
**SENPAT**
*****
;THE MONITOR WILL STOP
;THIS MODULE AFTER 20
;ERRORS

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ICAC DEC/X11 SYSTEM EXERCISER MODULE
XICACO.P11 12-OCT-78 12:00

MACY11 30A(1052) 12-OCT-78 16:38 PAGE 6

SEQ 0005

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* MONITOR TAKES *
* US BACK TO *
* "SENPA" *

```

218
219
220 000000
221 000000
222
223
224
225
226 000000
227 000000 041511 041501 040
228 000005 000
229 000006 171776
230 000010 000234
231 000012 300
232 000014 300
233 000014 000001
234 000016 000000
235 000020 000000
236 000022 000000
237 000024 000000
238
239 000026 140000
240 000030 000236
241 000032 000224
242 000034 000000
243 000036 177777
244 000040 000000
245 000042 000000
246 000044 000000
247 000046 000000
248 000050 000000
249 000052 000000
250 000054 000000
251 000056 000000
252 000056 000000
253 000060 000000
254 000064 000000
255 000064 000000
256 000066 000000
257 000070 000000
258 000074 000000
259 000076 000000
260 000076 000000
261 000100 000000
262 000102 000000
263 000104 000000
264 000104 000000
265 000104 000000
266 000106 000000
267 000110 000000
268 000110 000000
269 000112 000252
270 000114 000000
271 000120 000000
272 000120 000000
273 000122 000135

```

```

-
IOMOD <ICAC>,171776,234,6,6,,177777,135
MODULE 140000,ICAC,171776,234,6,6,,177777,135
-TITLE ICAC DEC/X11 SYSTEM EXERCISER MODULE
; DXCDM VERSION 6 23-MAY-78
;LIST
;*****
BEGIN:
MODNAM: .ASCII /ICAC / ;MODULE NAME
XFDRAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
ADDR: 171776+0 ;1ST DEVICE ADDR.
VECTOR: 234+0 ;1ST DEVICE VECTOR.
BR1: .BYTE PRTV6+0 ;1ST BR LEVEL.
BR2: .BYTE PRTV6+0 ;2ND BR LEVEL.
DVID1: +1 ;DEVICE INDICATOR 1.
SR1: OPEN ;SWITCH REGISTER 1
SR2: OPEN ;SWITCH REGISTER 2
SR3: OPEN ;SWITCH REGISTER 3
SR4: OPEN ;SWITCH REGISTER 4
;*****
STAT: 140000 ;STATUS WORD
INTR: 5400 ;MODULE START ADDR.
SPOINT: MODSP ;MODULE STACK POINTER.
PASCNT: 0 ;PASS COUNTER.
ICOUNT: 177777 ;LOC TO COUNT ITERATIONS
SOPCNT: 0 ;LOC TO SAVE TOTAL SOFT ERRORS
HRDCNT: 0 ;LOC TO SAVE TOTAL HARD ERRORS
SOPPAS: 0 ;LOC TO SAVE SOFT ERRORS PER PASS
HRDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS
SYSCNT: 0 ;# OF SYS ERRORS ACCUMULATED
RANMOD: 0 ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
CONF1G: 0 ;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.
RSTRT: RSTRT ;RESTART ADDRESS AFTER END OF PASS
WDTO: OPEN ;WORDS TO MEMORY PER ITERATION
WDFR: OPEN ;WORDS FROM MEMORY PER ITERATION
INTRP: OPEN ;INTERRUPTS PER ITERATION
IDNUM: 135 ;MODULE IDENTIFICATION NUMBER=135

```

```

274 000040
275
276
277
278
279 000224
280
281 000224 171776
282 000226 171774
283 000230 171772
284 000232 000000
285 000234 000000
286
287
288
289 000236 012767 000001 177654
290 000244 012767 000026 177644
291
292 000252 016767 177530 177744
293 000260 016767 177740 177740
294 000268 016767 000002 177732
295 000274 016767 177726 177726
296 000302 162767 000002 177720
297 000310 010700
298 000312 010067 177714
299 000316 162767 000012 177706
300
301
302
303
304
305 000324 005767 177510
306 000330 001402
307 000332 104413 000000
308
309
310 000336 016703 177670
311 000342 012377 177662
312 000346 029307
313 000350 002774
314
315
316 000352 005067 177656
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319
320
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328 000356 016701 177426
329 000362 012721 000404

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-REPT SPSIZ ;MODULE STACK STARTS HERE.
-NLIST
-WORD 0
-LIST
-ENDR
MODSP:
;*****
ICSR: 171776 ;ICS-11 CONTROL REGISTER.
ICAR: 171774 ;ICS-11 ADDRESS REGISTER.
ICAD: 171772 ;ICS-11 UNUSED ADDR.
XADR: -WORD 0 ;ADDR. OF DATA PATTERNS.
ICSINT: -WORD 0 ;INDICATES ICS INTERRUPTED IF=1.
;*****
;*MODULE INITIALIZATION
START: MOV #1,INTR ;ONE INTERRUPT/ITERATION
MOV #22,WDFR ;22. WORDS FROM MEM/ITERATION
RSTRT: MOV ADDR, ICSR ;GET ADDR. OF ICSR. (CONTROL AND STATUS REGISTER).
MOV ICSR, ICAR ;FORM ADDR. OF ICAR. (ADDRESS REGISTER).
SUB #2, ICAR ;FORM ADDR. OF ICAR. (ADDRESS REGISTER).
MOV ICAR, ICAD ;FORM XFERR ADDR. (UNUSED ICS-11 ADDR.)
SUB #2, ICAD ;EQUAL TO TWO LESS THAN ICAR.
MOV R2, RO ;GET CURRENT MEMORY ADDRESS.
MOV R0, XADR ;SET A POINTER TO MEMORY ADDR. 22 WORDS
SUB #10, XADR ;LESS THAN THIS ADDRESS.
;*TRANSFER 22 WORDS TO ICS UNUSED ADDR.
;SOLELY TO GENERATE MORE NOISE ON THE UNIBUS
SENPAT: TST ICOUNT ;FIRST ITERATION THIS PASS
BEG IS ;YES
ENDITS,BEGIN ;SIGNAL END OF ITERATION.
;MONITOR SHALL TEST END OF PASS
1$: MOV XADR, R3 ;GET PATTERN ADDR.
2$: MOV (3)+, @ICAD ;SEND PATTERN.
CMP R3, R7 ;HAVE WE XFERRED MEMORY PATTERNS UP TO THIS ADDRESS?
BLT 2$ ;NO - REPEAT.
;*CAUSE AN ICS-INTERRUPT
CLR ICSINT ;CLEAR INTERRUPT INDICATOR.
;ICSR IS CLEARED BY THIS INSTR.
;THEN THE ICS-11 IS FORCED TO INTR.
;THE INTR. SERVICE ROUTINE COMPLEMENTS
;THIS LOCATION, THUS IF TWO INTERRUPTS
;OCCUR (ONE BY A MAINTNANCE INTR.
;AND EXTRAS BECAUSE THE MAINTNANCE
;INTERRUPT COULD NOT BE CLEARED, ICSINT
;WOULD GO TO ZERO IN THE INTR.
;SERVICE ROUTINE INDICATING AN
;UNEXPECTED INTERRUPT.
MOV VECTOR, R1 ;SET-UP INTERRUPT VECTOR
MOV #ICSR, (R1)+ ;FOR INTERRUPT AND

```


ICAC DEC/X11 SYSTEM EXERCISER MODULE MACV11 30A(1052) 12-OCT-78 16:38 PAGE 14
XICACO.F11 12-OCT-78 12:00 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0012

XFLAG 000005R 228#

. ABS. 000000 000
000526 001

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

XICACO,XICACO/SOL/CRF:SYM=DDXCOM,XICACO
RUN-TIME: 1 1 .2 SECONDS
RUN-TIME RATIO: 15/3=5.1
CORE USED: 7K (13 PAGES)

DIAGNOSTIC ENGINEERING

digital

DECO 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	CXICA	C	1	01	22 JAN 79	OBSELETE	XLG		R	1975 1979

TITLE CXICAC1 TCS-11 MODULE
 AUTHOR D. RUTENHOF MAINTAINING GROUP DEC/X11 SPT GRD 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	DEPO	AF-E869C-M1					

PRODUCTS OBSOLETE (other than previous version)								
LIBRARY	PRODUCT NUMBER	REV	LIBRARY	PRODUCT NUMBER	REV	LIBRARY	PRODUCT NUMBER	REV
MD			MD			MD		

PRODUCT CHARACTERISTICS																			
PROCESSORS PRODUCT OPERATES WITH (Enter all applicable 2-digit codes representing the Processor the product operates with. See separate instructions.)																			
03	04	05	10	20	21	34	35	40	45	50	55	60	70						
OPERATIONAL CODES (Enter all applicable 2-digit codes that describe the product. See separate instructions.)																			
02	03	04	06	50															
ACT/APT/XXDP	EXT	ACT SEQ NUMBER	ACT/XXDP COMPATIBLE?	APT COMPATIBLE?	1ST PASS RUN TIME	SUBSEQUENT PASS RUN TIME													
INFORMATION FIELD			Y N	Y N	60 SECONDS	60 SECONDS													

DECO/DEPO INFORMATION							
PROBLEM REPORTS CLOSED:							
DEVICE AFFECTED DEC/X11				MULTIMEDIA AFFECTED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
KIT NUMBERS	ZJ130-RB	ZJ239-RY	ZJ239-RZ	ZJ240-PB	ZJ240-RE	ZJ239-PB	ZJ239-RB
	ZJ239-FR	ZJ240-RB	ZJ240-FR	ZJ240-RZ			

PROBLEM:
 Module declares end of iteration only if it has already done so.

SOLUTION:
 It will declare end of iteration even though it has not yet done so.
 Side effect: it will declare 1 iteration (not a pass) prior to beginning testing.

DEPO PATCH AREA					
CHANGE LOC	FROM	TO	CHANGE LOC	FROM	TO
330	1402	240			

SUBMITTING ENGINEER <i>D. Rutenhof</i>	MANUFACTURING ENGINEER <i>William A. Dean</i>	SUPPORT ENGINEER	CHARGE DECO/DEPO TO DISCRETE PROJECT NUMBER 098-05460
DATE: 23-jan-79	DATE: 21-MAR-79	DATE:	
MAINTAINER <i>D. Rutenhof</i>	FIELD SERVICE	WAIVERING MANAGER	COORDINATION NO. MC# 2837
DATE: 23-jan-79	DATE:	DATE:	