

I D E N T I F I C A T I O N

PROGRAM CODE: AC-F912C-MC
PROGRAM NAME: CZCMJCO CMR-11 MOST EXERCISER
DATE CREATED: 30-MAY-79
MODIFIED: 14-JAN-80, 28-NOV-80, 28-SEP-84
MAINTAINER: SPECIAL SYSTEMS KANATA

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TABLE OF CONTENTS

HEADING	SECTION
GENERAL	1.
REQUIREMENTS	2.
RESTRICTIONS	3.
CAUTIONS	4.
ASSUMPTIONS	5.
OPTIONS / CONTROLS	6.
LOADING	7.
STARTING / RESTARTING	8.
TEST DESCRIPTION	9.
START-UP	9.1
TEST SELECTOR	9.2
LOGIC TEST	9.3
PORT LOOP-BACK	9.4
HOST-REMOTE EXERCISE	9.5
MAINTENANCE ROUTINE	9.6
END OF PASS	9.7
ERRORS	10

1. GENERAL

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THIS PROGRAM IS TO BE USED TO TEST THE COMPACT MICRO REMOTE HOST HARDWARE (CMR-11 M8990 OR CMV11 M7181-M7182) AND TO BASICALLY CHECK COMMUNICATIONS BETWEEN THE HOST HARDWARE ON THE UNIBUS AND THE REMOTE HARDWARE.

THE PROGRAM IS DIVIDED INTO THREE PARTS, PLUS A FOURTH MULTIPURPOSE "MAINTENANCE" ROUTINE:

- HOST LOGIC TEST
- PORT LOOP-BACK TEST
- CMR EXERCISE ROUTINE
- "MAINTENANCE" ROUTINE

THE HOST LOGIC TEST IS INTENDED TO BE RUN WITH ALL REMOTE COMMUNICATION DISABLED OR DISCONNECTED AS IS THE PORT LOOP-BACK TEST. THE CMR EXERCISE ROUTINE, HOWEVER, CAN BE RUN WITHOUT CHANGING ANY OF THE HARDWARE FROM ITS "INSTALLED" CONDITION. FOR THE DETAILS OF EACH TEST, SEE THE ACCOMPANYING TEXT.

2. REQUIREMENTS

HARDWARE:

PDP-11 OR LSI-11
16K OR MORE MEMORY
CMR HOST MODULE(S) ON THE UNIBUS (Q-BUS)
CONSOLE TERMINAL ON LINE.

PORT JUMPERS:

FOR PORT LOOP BACK TEST A
10 PIN FEMALE BERG PLUG IS REQUIRED
WITH PINS 9 TO 2 AND 7 TO 10 JUMPED
FOR EACH PORT TO BE TESTED.

OTHER:

THE PROCESSOR MAINDECS AND CONSOLE TERMINAL TESTS
MUST HAVE BEEN RUN SUCCESSFULLY BEFORE RUNNING
THIS PROGRAM.

3. RESTRICTIONS

THE MOST LOGIC TEST WILL GIVE ERRORS IF REMOTES ARE CONNECTED AND ON-LINE.

4. CAUTIONS

--

IT IS NOT ADVISABLE TO RUN THE LOGIC TEST OR THE PORT LOOP-BACK TEST ON AN "ON-LINE" SYSTEM WITH THE REMOTES ATTACHED AS "ON-LINE" DEVICES MAY BE AFFECTED. THE CMR EXERCISE ROUTINE, HOWEVER, MAY BE RUN UNDER THESE CONDITIONS.

COMMUNICATION PORTIONS OF THESE TESTS FROM HOST TO REMOTE AND REMOTE TO HOST MAY TAKE A CONSIDERABLE LENGTH OF TIME IF THE PORT BAUD RATES ARE SET LOW (300 BAUD).

CAUTION MUST BE EXERCISED WHEN USING THE "MAINTENANCE" ROUTINE SO THAT FUNCTIONS ARE NOT STARTED WHICH WILL COMPROMISE ANY "ON-LINE" SITUATIONS.

5. ASSUMPTIONS

5.1 IN THE PORT LOOP-BACK TEST, IT IS ASSUMED THAT WHEN THE OPERATOR TYPES <CR> INDICATING "READY", HE HAS LOOPED A PORT FROM OUTPUT TO INPUT PHYSICALLY, AND HAS SELECTED THAT PORT TO BE TESTED.

5.2 IT IS ASSUMED, IN THE CMR EXERCISE ROUTINE, THAT THERE ARE REMOTES ATTACHED (AT LEAST ONE) AND THAT THEY ARE "REGULAR". IF THIS IS NOT THE CASE, THE ROUTINE WILL BE IDLE.

6. OPTIONS / CONTROLS

6.1 SWITCHABLE OPTIONS (COMBINABLE)

SWR -	MEANS
-----	-----
100000	DON'T HALT AFTER ERRORS
040000	DON'T PRINT ERRORS
020000	LOOP ON ERRONEOUS ROUTINE
004000	INHIBIT PROGRAM ITERATIONS
002000	DON'T PRINT END OF PASS

6.2 CONTROL CHARACTERS

CNTRL-C	RESTART TEST SELECTOR
CNTRL-T	" " "
CNTRL-G	SHOW "SWR" OPTIONS
CNTRL-P	PROCEED
CNTRL-O	ENTER "MAINTENANCE" DEBUG ROUTINE
CNTRL-F	SHOW CONSOLE FILL COUNT
CNTRL-A	PRINT PORT CONFIG TABLE

6.3 NON SWR PROCESSORS

ON PROCESSORS WITH NO PHYSICAL SWITCH REGISTER THE OPTIONS CAN BE EXAMINED OR CHANGED BY THE USE OF "CNTRL-G" AND AT THE TIME OF AN ERROR HALT. THE PRINTOUT: SWR = XXXXXX : WILL SHOW THE OPTIONS AND THE OPERATOR CAN LEAVE THEM (<CR>) OR CHANGE THEM (YYYYYY<CR>), THEN PROCEED (P)

7. LOADING

 THE PROGRAM IS SUPPLIED IN .ABS FORMAT AND IS LOADED BY MEANS OF THE ABSOLUTE LOADER OR THE "LOAD" COMMAND OF THE DIAGNOSTIC MONITOR XXDP.

8. STARTING / RESTARTING

 STARTING ADDRESS : 200
 RESTARTING ADDRESS : 204

9. TEST DESCRIPTION

9.1 START UP:

INTERFACE ADDRESS: (NNNNNN)
 INTERFACE VECTOR: (NNN)
 INTERFACE PRIORITY: (NN)

THE VALUE SHOWN IN PARENTHESIS ARE DEFAULT VALUES WHICH WILL BE USED IF ONLY <CR> IS ENTERED. IF A NEW VALUE IS ENTERED (XXX), IT WILL BE USED AS THE DEFAULT AT FUTURE START-UPS.

IF THE PROCESSOR HAS NO SWITCH REGISTER, THE SWITCH OPTIONS WILL NOW BE SHOWN AND MAY BE CHANGED (AS IN #6).

GENERAL

RESPOND BY TYPING A 0 (OR JUST <CR>) IF YOU WANT TO TELL THE ROUTINE WHICH REMOTES ARE ON LINE AND ONLY THOSE WILL BE SCANNED. THEN A "FORCE INTERROGATE" FUNCTION IS DONE ON EACH REMOTE FOUND.

IF 'GENERAL' IS CHOSEN, THE USER IS PROMPTED FOR THE REMOTE NUMBERS HE WISHES TO BE SCANNED AS FOLLOWS:

TYPE PORT/REMOTE #'S (400=HELP, <CR>=END)

1 REM # :

THE USER IS COMPELLED TO ENTER AT LEAST 1 REMOTE NUMBER BECAUSE THE PROGRAM KEEPS PROMPTING FOR THE FIRST REMOTE IF JUST A <CR> IS TYPED FOR THE FIRST REMOTE #.

EACH ENTRY IS COUNTED IN THE LEFT COLUMN BECAUSE A MAXIMUM OF 32 ENTRIES ARE ALLOWED.

WHEN ALL REMOTE NUMBERS ARE ENTERED, TYPE ONLY <CP> IN RESPONSE TO THE PROMPT AND THE EXERCISER WILL BEGIN.

THE ROUTINE STARTS A BACKGROUND SCAN AND WAITS FOR THE END OF A SCAN OF ALL REMOTES ON ALL PORTS ("THRU"). DURING THIS WAIT, IF ANY ALARMS OCCUR, THE BELL ON THE CONSOLE WILL RING (4 TIMES PER ALARM).

AT THE COMPLETION OF THE SCAN, THE PROGRAM SHOWS THE PORT CONFIGURATION STATUS AS FOLLOWS:

PORT #0	0(1)	1(1)	2(1)	3(1)	...
PORT #1	100(1)	101(1)	102(0)	103(0)	...

ETC.

SHOWING EACH PORT ONLY IF THERE ARE REMOTES ON THE PORT W/ CH ARE "REGULAR" AND SHOWING THE REMOTE "STATE" WHERE:

- (0) = INITIALIZED
- (1) = PASSIVE
- (2) = ACTIVE

***** THIS PRINTOUT ALSO OCCURS IF CNTRL-A *****
 ***** IS TYPED ANY TIME AFTER THE FIRST *****
 ***** TABLE IS PRINTED. *****

FOLLOWING THIS PRINTOUT, THE "DIAGNOSTIC" OR "FORCE INTERROGATE" FUNCTION IS ATTEMPTED ON EACH REMOTE PRESENT.

DIAGNOSTIC FUNCTION IF RUNNING "DETAILED"
 FORCE INTERROGATE FUNCTION IF RUNNING "GENERAL"

DURING THE REMAINDER OF THE EXERCISE, ALL REMOTES WILL BE EXERCISED WITH THE "DIAGNOSTIC" FUNCTION OR THE "FORCE INTERROGATE FUNCTION" AND ALL ALARMS WILL BE INDICATED (BY BELLS) AND ANY CHANGES OF REMOTE STATUS WILL BE REPORTED:

*** REMOTE STATUS CHANGE ***
 REMOTE #X

REMOTE STATUS NOW- / REGULAR
 \ IRREGULAR
 \ YYYY

9.6 "MAINTENANCE" DEBUG ROUTINE

CAUTION SHOULD BE EXERCISED WHEN USING THIS ROUTINE
SEE SECT. 4.

THIS ROUTINE OPERATES LIKE A SIMPLE "ODT". HOWEVER,
IT ALLOWS EXAMINING AND/OR DEPOSITING ONLY IN THE
CMR-11 SCRATCHPAD MEMORY. YOU CAN ACTUALLY ENTER
FUNCTION CODES INTO THE REQUEST SCRATCHPAD MEMORY.
ENTER EACH WORD OF THE FUNCTION ACCORDING TO CHAPTER
3 OF THE CMR11 SYSTEMS OPTION DESCRIPTION (YC-C318C-00).

THEN YOU START THE FUNCTION BY TYPING "G". THE
RESULTS ARE GIVEN BACK TO YOU IN THE RESULTS SCRATCHPAD
AT ADDRESS 1000 AND UP.

FOLLOWING ARE THE OPERATING
CHARACTERS:

- XXXX/ (SLASH) OPEN AND DISPLAY CONTENTS
OF THE SCPD ADDR "XXXX"
- <CR> (RETURN) CLOSE THE CURRENT ADDRESS.
- <LF> (LINE FEED) CLOSE THE CURRENT ADDR. AND
OPEN THE NEXT SEQUENTIAL ONE.
- XXXX<CR> DEPOSIT "XXXX" IN THE CURRENTLY
OPEN ADDRESS AND CLOSE IT.
- XXXX<LF> DEPOSIT "XXXX" IN THE CURRENTLY
OPEN ADDRESS, CLOSE IT AND
OPEN THE NEXT SEQUENTIAL ONE.
- G SET "STFUN" OR "MAIN" TO START
THE CURRENTLY LOADED FUNCTION
- P PROCEED OUT OF THE 'DE-BUG'
ROUTINE AND RETURN TO THE SPOT
WHICH WAS LEFT WHEN CNTRL-O
WAS TYPED. (ANY PROMPTS WILL
BE RE-ASKED).
- (CSR ADDR)/ ALLOWS EXAMINATION OF THE HOST
CSR REGISTER ONLY. NO OTHER
UNIBUS ADDRESSES MAY BE EXAMINED
IN THIS FASHION.

9.7 END OF PASS

AT THE END OF EACH PASS OF ANY OF THE THREE TESTS, AN "END PASS" MESSAGE IS PRINTED UNLESS INHIBITED BY SWITCH OPTION BIT 10.

THE PRINTOUT IS IN THE FOLLOWING FORM:

END PASS # X ERR. CNT. = Y

WHERE:

X = THE PASS NUMBER IN DECIMAL

Y = THE TOTAL NUMBER OF ERRORS SINCE START (DECIMAL).

IF THE NUMBER OF ERRORS BECOMES LARGER THAN 64K, THEN "*** OVERFLOW ***" WILL BE PRINTED INSTEAD.

IF SWITCH OPTION BIT 11 = 0, THIS MESSAGE WILL BE PRINTED ONLY AFTER 10 (OCTAL) PASSES THROUGH WHICHEVER TEST IS RUNNING. OTHERWISE, IT IS PRINTED EVERY PASS.

TIME IN THE PORT LOOP BACK TEST AND THE CMR EXERCISE ROUTINE, THE ELAPSED TIME SINCE START-UP (OR CNTRL-C) IS PRINTED ALONG WITH THE END OF PASS MESSAGE PROVIDING THAT THE PROCESSOR IS EQUIPPED WITH A REGULAR LINE-TIME CLOCK. THE FORMAT OF THE TIME PRINTOUT IS AS FOLLOWS:

EL.TIM. HH:MM:SS:TT

(HOURS, MINUTES, SECONDS, AND TICKS WHERE ONE TICK = 1/60 SEC.)

10. ERRORS

FOR THE MOST PART, ERROR PRINTOUTS ARE SELF-EXPLANATORY. THE ERROR NUMBERS AND ADDRESSES CAN BE USED FOR REFERENCE TO THE PROGRAM LISTING FOR FURTHER DETAILS.

ALL ERRORS WILL CAUSE THE CPU TO "HALT" OR ENTER THE "SWITCH MONITOR" UPON THE OCCURRENCE OF AN ERROR UNLESS SWITCH OPTION BIT 15 IS SET (1). THIS IS DONE SO THAT THE OPERATOR HAS THE OPPORTUNITY TO SET UP A OCILLOSCOPE ON THE SUSPECT LOGIC AND CAUSE THE PROGRAM TO "LOOP" IN THE ERROR CAUSING CODE BY SETTING SWITCH OPTION BIT 15, 14 AND 13 AND CONTINUING.

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05
TABLE OF CONTENTS

1	2	SYMBOLIC DEFINITIONS
1-	55	MACRO DEFINITIONS
2-	1	TRAP CATCHERS
3-	1	SYMBOLIC LISTING
5-	1	SUPERVISOR DISPATCH
6-	1	MOST LOGIC TEST
17	1	PORT LOOP-BACK TEST
18-	1	MOST-REMOTE EXERCISE
28-	1	MAINTENANCE ROUTINE
29-	1	UTILITY ROUTINES
30-	1	"SWITCH" MONITOR ROUTINE
31-	1	MESSAGE PRINT ROUTINE
32	1	KEYBOARD INPUT ROUTINE
35	1	BINARY TO ASCII CONVERSION ROUTINES
37-	1	CONSTANTS, VARIABLES & ASCII

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.TITLE CZCMJCO CMR(V)-11 MOST EXERCISE
.SBTTL SYMBOLIC DEFINITIONS
.NLIST TTM
.LIST ME

;INTERNAL DEFINITIONS:

177776 PS = 177776
177570 MWSWR = 177570
032502 SSWR = SWREG

;REGISTER DEFINITIONS:

000000 R0 = #0
000001 R1 = #1
000002 R2 = #2
000003 R3 = #3
000004 R4 = #4
000005 R5 = #5
000006 SP = #6
000007 PC = #7

;BUS REQUEST DEFINITIONS:

000340 P7 = 340
000300 P6 = 300
000240 P5 = 240
000200 P4 = 200
000140 P3 = 140
000100 P2 = 100
000040 P1 = 40
000000 P0 = 0

;BIT DEFINITIONS:

100000 B15 = 100000
040000 B14 = 40000
020000 B13 = 20000
010000 B12 = 10000
004000 B11 = 4000
002000 B10 = 2000
001000 B09 = 1000
000400 B08 = 400
000200 B07 = 200
000100 B06 = 100
000040 B05 = 40
000020 B04 = 20
000010 B03 = 10
000004 B02 = 4
000002 B01 = 2
000001 B00 = 1
002000 ISP = BEGIN

;INITIAL STACK POINTER

.SBTTL MACRO DEFINITIONS

```

58      00000:      N      *      1      ;INITIAL ERROR NUMBER
59      ;ERROR MACROS
60
61      .MACRO  ERROR  P,MSG
62
63      BIT      @B14,BSR
64      BNE      .+20
65      MOV      @MSG,R0
66      MOV      @P,ERRNUM
67      JSR      PC,ERR
68      "      N+1
69      .ENDM
70
71      .MACRO  DATERR  P,MSG
72
73      BIT      @B14,BSR
74      BNE      .+20
75      MOV      @MSG,R0
76      MOV      @P,ERRNUM
77      JSR      PC,DERR
78      "      N+1
79      .ENDM
80
81      .MACRO  HLT
82      JSR      PC,SMHLT
83      .ENDM
84
85      ;PRINT MACRO (MSG ADDR IN R0)
86
87      .MACRO  PNTM      A
88      MOV      @A,R0
89      JSR      PC,TYPOUT
90      .ENDM
91
92      ;SCOPE LOOP MACRO
93
94      .MACRO  SCOPE      X
95      JSR      R5,SCPRTN
96      X
97      .ENDM
98
99      ;INTER-PDP-11 COMPATABLE MOVE TO PS
100
101      .MACRO  MTPS      SRC,?LLL
102      MOV      SRC,-(SP)
103      MOV      @LLL,-(SP)
104      RTI
105      LLL:
106      .ENDM
107
108
109      ;REGISTER SAVE AND RESTORE MACROS
110
111      .MACRO  REGSAV
112      JSR      R5,REGSAV
113      .ENDM
114

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C2

SEQ 0015

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 1 ?
MACRO DEFINITIONS

115
116
117

.MACRO REGRES
JSR R5,REGRES
.ENDM

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 2 1
TRAP CATCHERS

000144	000146	.WORD	.+2
000146	000000	.WORD	0
000150	000152	.WORD	.+2
000152	000000	.WORD	0
000154	000156	.WORD	.+2
000156	000000	.WORD	0
000160	000162	.WORD	.+2
000162	000000	.WORD	0
000164	000166	.WORD	.+2
000166	000000	.WORD	0
000170	000172	.WORD	.+2
000172	000000	.WORD	0
000174	000176	.WORD	.+2
000176	000000	.WORD	0
000200	000202	.WORD	.+2
000202	000000	.WORD	0
000204	000206	.WORD	.+2
000206	000000	.WORD	0
000210	000212	.WORD	.+2
000212	000000	.WORD	0
000214	000216	.WORD	.+2
000216	000000	.WORD	0
000220	000222	.WORD	.+2
000222	000000	.WORD	0
000224	000226	.WORD	.+2
000226	000000	.WORD	0
000230	000232	.WORD	.+2
000232	000000	.WORD	0
000234	000236	.WORD	.+2
000236	000000	.WORD	0
000240	000242	.WORD	.+2
000242	000000	.WORD	0
000244	000246	.WORD	.+2
000246	000000	.WORD	0
000250	000252	.WORD	.+2
000252	000000	.WORD	0
000254	000256	.WORD	.+2
000256	000000	.WORD	0
000260	000262	.WORD	.+2
000262	000000	.WORD	0
000264	000266	.WORD	.+2
000266	000000	.WORD	0
000270	000272	.WORD	.+2
000272	000000	.WORD	0
000274	000276	.WORD	.+2
000276	000000	.WORD	0
000300	000302	.WORD	.+2
000302	000000	.WORD	0
000304	000306	.WORD	.+2
000306	000000	.WORD	0
000310	000312	.WORD	.+2
000312	000000	.WORD	0
000314	000316	.WORD	.+2
000316	000000	.WORD	0
000320	000322	.WORD	.+2
000322	000000	.WORD	0
000324	000326	.WORD	.+2

CZCMJCO CHR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 2-2
TRAP CATCHERS

000326	000000	.WORD	0
000330	000332	.WORD	.+2
000332	000000	.WORD	0
000334	000336	.WORD	.+2
000336	000000	.WORD	0
000340	000342	.WORD	.+2
000342	000000	.WORD	0
000344	000346	.WORD	.+2
000346	000000	.WORD	0
000350	000352	.WORD	.+2
000352	000000	.WORD	0
000354	000356	.WORD	.+2
000356	000000	.WORD	0
000360	000362	.WORD	.+2
000362	000000	.WORD	0
000364	000366	.WORD	.+2
000366	000000	.WORD	0
000370	000372	.WORD	.+2
000372	000000	.WORD	0
000374	000376	.WORD	.+2
000376	000000	.WORD	0
000400	000402	.WORD	.+2
000402	000000	.WORD	0
000404	000406	.WORD	.+2
000406	000000	.WORD	0
000410	000412	.WORD	.+2
000412	000000	.WORD	0
000414	000416	.WORD	.+2
000416	000000	.WORD	0
000420	000422	.WORD	.+2
000422	000000	.WORD	0
000424	000426	.WORD	.+2
000426	000000	.WORD	0
000430	000432	.WORD	.+2
000432	000000	.WORD	0
000434	000436	.WORD	.+2
000436	000000	.WORD	0
000440	000442	.WORD	.+2
000442	000000	.WORD	0
000444	000446	.WORD	.+2
000446	000000	.WORD	0
000450	000452	.WORD	.+2
000452	000000	.WORD	0
000454	000456	.WORD	.+2
000456	000000	.WORD	0
000460	000462	.WORD	.+2
000462	000000	.WORD	0
000464	000466	.WORD	.+2
000466	000000	.WORD	0
000470	000472	.WORD	.+2
000472	000000	.WORD	0
000474	000476	.WORD	.+2
000476	000000	.WORD	0
000500	000502	.WORD	.+2
000502	000000	.WORD	0
000504	000506	.WORD	.+2
000506	000000	.WORD	0

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 2 3
TRAP CATCHERS

000510	000512	.WORD	.+2
000512	000000	.WORD	0
000514	000516	.WORD	.+2
000516	000000	.WORD	0
000520	000522	.WORD	.+2
000522	000000	.WORD	0
000524	000526	.WORD	.+2
000526	000000	.WORD	0
000530	000532	.WORD	.+2
000532	000000	.WORD	0
000534	000536	.WORD	.+2
000536	000000	.WORD	0
000540	000542	.WORD	.+2
000542	000000	.WORD	0
000544	000546	.WORD	.+2
000546	000000	.WORD	0
000550	000552	.WORD	.+2
000552	000000	.WORD	0
000554	000556	.WORD	.+2
000556	000000	.WORD	0
000560	000562	.WORD	.+2
000562	000000	.WORD	0
000564	000566	.WORD	.+2
000566	000000	.WORD	0
000570	000572	.WORD	.+2
000572	000000	.WORD	0
000574	000576	.WORD	.+2
000576	000000	.WORD	0
000600	000602	.WORD	.+2
000602	000000	.WORD	0
000604	000606	.WORD	.+2
000606	000000	.WORD	0
000610	000612	.WORD	.+2
000612	000000	.WORD	0
000614	000616	.WORD	.+2
000616	000000	.WORD	0
000620	000622	.WORD	.+2
000622	000000	.WORD	0
000624	000626	.WORD	.+2
000626	000000	.WORD	0
000630	000632	.WORD	.+2
000632	000000	.WORD	0
000634	000636	.WORD	.+2
000636	000000	.WORD	0
000640	000642	.WORD	.+2
000642	000000	.WORD	0
000644	000646	.WORD	.+2
000646	000000	.WORD	0
000650	000652	.WORD	.+2
000652	000000	.WORD	0
000654	000656	.WORD	.+2
000656	000000	.WORD	0
000660	000662	.WORD	.+2
000662	000000	.WORD	0
000664	000666	.WORD	.+2
000666	000000	.WORD	0
000670	000672	.WORD	.+2

000672	000000	.WORD	0
000674	000676	.WORD	.+2
000676	000000	.WORD	0
000700	000702	.WORD	.+2
000702	000000	.WORD	0
000704	000706	.WORD	.+2
000706	000000	.WORD	0
000710	000712	.WORD	.+2
000712	000000	.WORD	0
000714	000716	.WORD	.+2
000716	000000	.WORD	0
000720	000722	.WORD	.+2
000722	000000	.WORD	0
000724	000726	.WORD	.+2
000726	000000	.WORD	0
000730	000732	.WORD	.+2
000732	000000	.WORD	0
000734	000736	.WORD	.+2
000736	000000	.WORD	0
000740	000742	.WORD	.+2
000742	000000	.WORD	0
000744	000746	.WORD	.+2
000746	000000	.WORD	0
000750	000752	.WORD	.+2
000752	000000	.WORD	0
000754	000756	.WORD	.+2
000756	000000	.WORD	0
000760	000762	.WORD	.+2
000762	000000	.WORD	0
000764	000766	.WORD	.+2
000766	000000	.WORD	0
000770	000772	.WORD	.+2
000772	000000	.WORD	0
000774	000776	.WORD	.+2
000776	000000	.WORD	0

10

Line	Address	Op	Operand	Label	Comment
1					.SBTTL SYMBOLIC LISTING
2					" 200
3	000200	000167	001574	JMP	BEGIN
4	000204	012706	002000	MOV	#ISP,SP
5	000210	000005		RESET	
6	000212	000167	00 2	JMP	RESTRT
7					
8		002000			" 2000
9					
10	002000	012706	002000	BEGIN:	MOV #ISP,SP ;INITIALIZE THE STACK
11	002004	000005		RESET	;CLEAR THE WORLD
12	002006			MTPS	#P7 ;STOP INTERRUPTS
	002006	012746	000340	MOV	#P7,-(SP)
	002012	012746	002020	MOV	#64,-(SP)
	002016	000002		RTI	
	002020			64:	
13	002020	005067	030410	CLR	DEVER
14	002024	105067	030353	CLRB	LSIFLG ;PREPARE TO CHECK FOR LSI 11
15	002030	012737	017406 000004	MOV	#LSTST,#4
16	002036	012737	000340 000006	MOV	#P7,#6
17	002044	005737	177776	TST	#177776 ;CHECK FOR PSW &SET FLAG
18	002050	005067	030430	CLR	SWRFLG
19	002054	012737	017416 000004	MOV	#SRTST,#4 ;SET UP TO TRAP IF NO SWR.
20	002062	012737	000340 000006	MOV	#P7,#6
21	002070	012767	177570 030402	MOV	#MSWR,SR ;SET UP TO CHECK IF ANY MD SWR
22	002076	005777	030376	TST	BSR ;SEE IF IT'S THERE
23	002102	004767	017662	JSR	PC, NULLS ;NULLS AFTER RESET ;D.W 001
24	002106			PNTM	TSTHDR
	002106	012700	022212	MOV	#TSTHDR,RO ;PRINT MESSAGE
	002112	004767	016440	JSR	PC, TYP0UT ;POINTED TO BY TSTHDR
25	002116			PROMT:	PNTM FRAD ;ASK FOR 1ST UNIBUS ADDR OF CMR-11
	002116	012700	022577	MOV	#FRAD,RO ;PRINT MESSAGE
	002122	004767	016430	JSR	PC, TYP0UT ;POINTED TO BY FRAD
26	002126	016767	030370 017374	MOV	DEVADR, KBBUF ;LOAD DEFAULT ADDRESS
27	002134	004767	015452	JSR	PC, PRDFLT ;GO PRINT DEFAULT
28	002140	012767	002116 030304	MOV	#PROMT, PCONT ;LOAD RETURN ADDRESS
29	002146	004767	016446	JSR	PC, INPKB ;GET KBD INPUT
30					
31	002152	026727	017352 164000	CMP	KBBUF, #164000 ;IS IT WITHIN LIMIT?
32	002160	103006		BHIS	PRMT1 ;YES, TEST IT
33	002162			PNTM	AGAIN ;NO, ERROR & ASK AGAIN
	002162	012700	022624	MOV	#AGAIN,RO ;PRINT MESSAGE
	002166	004767	016364	JSR	PC, TYP0UT ;POINTED TO BY AGAIN
34	002172	000167	177720	JMP	PROMT
35	002176	012737	017434 000004	PRMT1:	MOV #DVATST,#4
36	002204	005777	030312	TST	#DEVADR ;IS IT A GOOD ADDR?
37	002210	012737	017654 000004	MOV	#HDER,#4 ;SET UP FOR FURTHER TRAPS
38	002216	005037	000006	CLR	#6 ;ALLOW CLOCK TO FUNCTION
39	002222	016767	017302 030272	PRMT2:	MOV KBBUF, DEVADR ;REPLACE CMR-11 DEFAULT ADDRESS ;D.W 001
40	002230			PNTM	DVECT
	002230	012700	022657	MOV	#DVECT,RO ;ASK FOR DEVICE VECTOR
	002234	004767	016316	JSR	PC, TYP0UT ;PRINT MESSAGE
41	002240	016767	030254 017262	MOV	VECTOR, KBBUF ;POINTED TO BY DVECT
42	002246	004767	015340	JSR	PC, PRDFLT ;LOAD DEFAULT VECTOR
43	002252	012767	002222 030172	MOV	#PRMT2, PCONT ;GO PRINT DEFAULT
44	002260	004767	016334	JSR	PC, INPKB ;LOAD RETURN ADDRESS
45	002264	026727	017240 000776	CMP	KBBUF, #776 ;GET KBD INPUT ;IS IT WITHIN LIMITS?

CZCMJCO CMR(V) 11 HOST EXERCISE MACRO V04.00 02:24:05 PAGE 3 2
SYMBOLIC LISTING

91	002554	005767	027724		TST	SWRFLG		;NON-SWR-PROCESSOR?
92	002560	001402			BEQ	1*		
93	002562	004767	015416		JSR	PC,SWDMP		;YES, DUMP SWITCH LOCATION
94	002566	000167	000102	1*:	JMP	BCONT		
95								
96	002572	105067	027575	CLKTRP:	CLRB	CLKFLG		;CLEAR CLOCK FLAG
97	002576	000002			RTI			;AND RETURN
98								

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 4
 SYMBOLIC LISTING

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1      ;LINE CLOCK SERVICE ROUTINE.
2      ;  JDATE RUN TIME CLOCK.
3
4 002600 112767 177777 027564 CLKINT: MOVB    #-1,CLKFL1      ;SET "CLK TICKING" FLAG
5 002606 105267 027602          INCB     TICKS           ;UPDATE TICKS
6 002612 126727 027576 000074  CMPB    TICKS,#60.     ;REACHED A SECOND?
7 002620 103424          BLO      CLKEXT         ;NO, JUST RETURN
8 002622 105067 027566          CLRB    TICKS           ;YES, 0 - TICKS
9 002626 105267 027557          INCB    SECS            ;AND UPDATE SECONDS
10 002632 126727 027553 000074  CMPB    SECS,#60.     ;REACHED A MINUTE?
11 002640 103414          BLO      CLKEXT         ;NO, JUST RETURN
12 002642 105067 027543          CLRB    SECS            ;YES, 0 - SECONDS
13 002646 105267 027532          INCB    MINS           ;AND UPDATE MINUTES
14 002652 126727 027526 000074  CMPB    MINS,#60.     ;REACHED AN HOUR?
15 002660 103404          BLO      CLKEXT         ;NO, JUST RETURN
16 002662 105067 027516          CLRB    MINS           ;YES, 0-MINUTES
17 002666 105267 027507          INCB    HOURS          ;AND UPDATE HOURS
18 002672 000002          CLKEXT: RTI           ;RETURN FROM CLOCK INTERRUPT

```

;D.W 001

.SBTTL SUPERVISOR DISPATCH

```

1
2
3
4 002674 000005          BCONT:  RESET          ;ALWAYS DO RESET UPON ARRIVAL
5 002676          MTPS      #P7          ;KILL INTERRUPTS
   002676 012746 000340  MOV      #P7,-(SP)
   002702 012746 002710  MOV      #64,-(SP)
   002706 000002          RTI
   002710          64$:
6 002710 105067 027461  CLR      CNFGFL          ;CLEAR CONFIG FLAG
7 002714 105067 027452  CLR      CLKFL1         ;CLR CLOCK TICKING FLAG
8 002720 105067 027470  CLR      TICKS          ;CLEAR RUN TIME CLOCK TIME
9 002724 105067 027461  CLR      SECS
10 002730 105067 027450  CLR      MINS
11 002734 105067 027441  CLR      HOURS
12 002740 105067 027444  CLR      SAFE          ;CLEAR "FILL CNT SAFETY FLAG"
13 002744 105067 027426  CLR      DBFLG         ;CLEAR "DEBUG" FLAG
14 002750 004767 017014  JSR      PC, NULLS      ;NULLS AFTER RESET ;D.W 001
15 002754          PNTM     TSTSEL       ;PRINT "SELECT TEST (<CR>=HELP)"
   002754 012700 023177  MOV      #TSTSEL,RO     ;PRINT MESSAGE
   002760 004767 015572  JSR      PC, TYPOUT     ;POINTED TO BY TSTSEL
16 002764 012767 000001 016536  MOV      #1,KB3UF       ;DEFAULT LOGIC TEST
17 002772 012767 002674 027452  MOV      #BCONT,PCONT   ;LOAD RETURN ADDRESS
18 003000 004767 015614  JSR      PC, INPKB      ;GET KBD INPUT
19 003004 005067 027442  CLR      PCONT
20 003010 026727 016514 000001  CMP      KBBUF,#1       ;CHECK IT FOR "1"
21 003016 001010          BNE      BCNT1          ;IF = 1, DO LOGIC TESTS
22 003020 105767 027347  TSTB    CLKFLG         ;IS THERE A CLOCK CSR?
23 003024 001403          BEQ      BCNT0          ;NO, FORGET IT.
24 003026 042777 000100 027476  BIC      #100,BLCS      ;YES, ENSURE IT'S IDLE
25 003034 000167 000120  BCNT0:  JMP      LOGTST   ;GO TO LOGIC TEST
26 003040 026727 016464 000002  BCNT1:  CMP      KBBUF,#2 ;CHECK IT FOR "2"
27 003046 001010          BNE      BCNT2
28 003050 105767 027317  TSTB    CLKFLG         ;IS THERE A CLOCK CSR?
29 003054 001403          BEQ      BCNT3          ;NO, FORGET IT
30 003056 052777 000100 027446  BIS      #100,BLCS      ;YES, ENABLE IT!!
31 003064 000167 006064  BCNT3:  JMP      PORTLP   ;IF "2" DO PORT LOOP TEST
32 003070 026727 016434 000003  BCNT2:  CMP      KBBUF,#3 ;CHECK IT FOR "3"
33 003076 001010          BNE      TSTRSK        ;IF NOT, GIVE HELP
34 003100 105767 027267  TSTB    CLKFLG         ;IS THERE A CLOCK CSR?
35 003104 001403          BEQ      BCNT4          ;NO, FORGET IT
36 003106 052777 000100 027416  BIS      #100,BLCS      ;YES, ENABLE IT!!
37 003114 000167 007412  BCNT4:  JMP      CMREXC    ;IF "3" DO EXERCISE.
38
39 003120 026727 016404 000004  TSTRSK: CMP      KBBUF,#4 ;DID HE TYPE A 4?
40 003126 001006          BNE      HLPASK        ;NO, BUT HE HAD BETTER!!
41 003130          PNTM     HELPM          ;PRINT HELPFUL INFO
   003130 012700 023226  MOV      #HELPM,RO     ;PRINT MESSAGE
   003134 004767 015416  JSR      PC, TYPOUT     ;POINTED TO BY HELPM
42 003140 000167 177530  JMP      BCNT          ;AND RE-ASK
43 003144          HLPASK: PNTM     HLPDSR        ;PRINT "IF HELP IS REQ'D..."
   003144 012700 024253  MOV      #HLPDSR,RO    ;PRINT MESSAGE
   003150 004767 015402  JSR      PC, TYPOUT     ;POINTED TO BY HLPDSR
44 003154 000167 177514  JMP      BCNT
45

```

.SBTTL MOST LOGIC

```

1
2
3
4           ; START OF LOGIC TEST. PRINT HEADER THEN ASK USER TO DISCONNECT           ;D.W 001
5           ; ALL REMOTE COMMUNICATIONS SO NO ERRORS OCCUR THAT WAY, THEN GO.         ;D.W 001
6
7 003160 005067 027330 LOGTST: CLR VERFLG ;CLEAR VERSION PRINT FLAG
8 003164 012767 000010 027246 MOV #10,ITFP ;SET ITERATION COUNT
9 003172 005067 027250 CLR PASCNT ;CLEAR PASS COUNT
10 003176 105067 027203 CLRBF OFLOF ;CLEAR "OVERFLOW" FLAG
11 003202 005067 027230 CLR ERRCNT ;CLEAR ERROR COUNT
12 003206 PNTM LGKTSM ;PRINT "LOGIC TEST"
    003206 012700 024320 MOV #LGKTSM,RO ;PRINT MESSAGE
    003212 004767 015340 JSR PC,TYPOUT ;POINTED TO BY LGKTSM
13 003216 PNTM BRKCOM ;PRINT "DISCONNECT REMOTES" ;D.W 001
    003216 012700 024335 MOV #BRKCOM,RO ;PRINT MESSAGE
    003222 004767 015330 JSR PC,TYPOUT ;POINTED TO BY BRKCOM
14 003226 CRPRM: PNTM TYPGR ;PRINT "TYPE <CR> WHEN READY" ;D.W 001
    003226 012700 024777 MOV #TYPGR,RO ;PRINT MESSAGE
    003232 004767 015320 JSR PC,TYPOUT ;POINTED TO BY TYPGR
15 003236 012767 003226 027206 CRTST: MOV #CRPRM,PCONT ;SET REPROMPT POINTER ;D.W 001
16 003244 012767 001236 016256 MOV #1236,KBBUF ;LOAD ANY DEFAULT VALUE ;D.W 001
17 003252 004767 015342 JSR PC,INP'B ;GET KEYBOARD INPUT ;D.W 001
18 003256 005067 027170 CLR PCONT ;D.W 001
19 003262 026727 016242 001236 CMP KBBUF,#1236 ;<CR> ONLY TYPED? ;D.W 001
20 003270 001356 BNE CRPRM ;IF NOT, KEEP LOOKING ;D.W 001
    ;IF YES, START LOGIC TEST ;D.W 001
21
22
23           ;CHECK POWER UP OF THE MOST MICRO FIRMWARE.
24
25 003272 000005 STO: RESET ;INIT
26 003274 012767 000024 027126 MOV #24,CNTR ;SET UP TIMER ;D.W 001
27 003302 032777 002000 027122 MOVB: BIT #B10,BCSR ;IS "PWRUP" SET? ;D.W 001
28 003310 001021 BNE ST1 ;IF YES, OKAY ;D.W 001
29 003312 005367 027112 DEC CNTR ;GIVE THE MICRO SOME TIME TO START ;D.W 001
30 003316 001371 BNE MOVB ;KEEP CHECKING ;D.W 001
31 003320 ERROR \N,NOGO ;ERROR:HOST U.P. FAILED TO START.
    ;***** ERROR 1 *****
    003320 032777 040000 027152 BIT #B14,BSR
    003326 001007 BNE .+20
    003330 012700 026477 MOV #NOGO,RO
    003334 012767 000001 014532 MOV #1,ERRNUM
    003342 004767 014360 JSR PC,ERR
    N = N+1
32 003346 SCOPE STO
    003346 004567 014122 JSR R5,SCRPTN
    003352 003272 STO
33 003354 012767 000000 027046 ST1: MOV #0,CNTR
34 003362 012767 102000 014506 ST1A: MOV #102000,GOOD ;NOW WATCH FOR INTR
35 003370 017767 027036 014502 MOV BCSR,BAD
36 003376 042767 075777 014474 BIC #75777,BAD
37 003404 026767 014466 014466 CMP GOOD,BAD
38 003412 001421 BEQ ST2 ;INTR & PWRUP SET; OKAY
39 003414 005367 027010 DEC CNTR ;WAIT A BIT
40 003420 001360 BNE ST1A
41 003422 DATERR \N,NOTUP ;ERROR:PWR UP SEQ NOT COMPLETED(BAD CSR)
    ;***** ERROR 2 *****
    
```


07

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1
2
3
4
5 003602 005077 026666          ST6:  CLR      BSPAR          ;TEST CLEAR OF SPAR
6 003606 005067 014264          CLR      GOOD
7 003612 017767 026656 014260  MOV      BSPAR,BAD          ;SPAR CLEAR?
8 003620 001416                BEQ      ST60              ;YES, OK
9 003622                DATERR  \N,SPRCLR          ;ERROR:CAN'T CLEAR SPAR
                                ;***** ERROR 4 *****

    003622 032777 040000 026650  BIT      #B14,BSR
    003630 001007                BNE      .+20
    003632 012700 026632          MOV      @SPRCLR,RO
    003636 012767 000004 014230  MOV      #4,ERRNUM
    003644 004767 014142          JSR      PC,DERR
                                =
                                N+1
10 003650                SCOPE   ST6
    003650 004567 013620          JSR      R5,SCPRTN
    003654 003602                ST6
11 003656 012767 177777 026564  ST60:  MOV      #-1,PAT          ;SET UP FOR SLIDING 0 TEST
12 003664 012767 000001 026552  MOV      #B00,MASK          ;SET BIT MASK
13 003672 016767 026552 014176  ST61:  MOV      PAT,GOOD
14 003700 042767 176000 014170  BIC      #176000,GOOD
15 003705 016777 014164 026560  MOV      GOOD,BSPAR          ;LOAD PATTERN
16 003714 017767 026554 014156  MOV      BSPAR,BAD          ;AND READ IT BACK
17 003722 042767 000400 014150  BIC      #B08,BAD
18 003730 042767 000400 014140  BIC      #B08,GOOD          ;IGNORE BIT 08
19 003736 026767 014134 014134  CMP      GOOD,BAD          ;SPAR DATA O.K. ?
20 003744 001416                BEQ      ST62              ;IF YES NEXT PATTERN
21 003746                DATERR  \N,SPRDAT          ;ERROR:BAD BITS IN SPAR
                                ;***** ERROR 5 *****

    003746 032777 040000 026524  BIT      #B14,BSR
    003754 001007                BNE      .+20
    003756 012700 026657          MOV      @SPRDAT,RO
    003762 012767 000005 014104  MOV      #5,ERRNUM
    003770 004767 014016          JSR      PC,DERR
                                =
                                N+1
22 003774                SCOPE   ST61
    003774 004567 013474          JSR      R5,SCPRTN
    004000 003672                ST61
23 004002 032767 001000 026440  ST62:  BIT      #B09,PAT          ;DONE WHOLE REG?
24 004010 001414                BEQ      ST7              ;IF YES, NEXT RTN
25 004012 012767 177777 026430  MOV      #-1,PAT          ;RE-LOAD ALL 1'S
26 004020 046767 026420 026422  BIC      MASK,PAT          ;NO, PREPARE FOR NEXT BIT
27 004026 006367 026412          ASL      MASK          ;ROTATE MASK
28 004032 004767 014114          JSR      PC,MONIT
29 004036 000167 177630          JMP      ST61          ;AND CONTINUE
    
```

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1          ;SCRATCH PAD MEMORY TEST
2          ; (1) UP COUNT IN REQ SCPD WHILE FILLING RES SCPD WITH 377'S
3          ; (2) UP COUNT IN RES SCPD WHILE FILLING REQ SCPD WITH 377'S
4
5 004042 005077 026426      ST7:   CLR   BSPAR           ;ADDRESS 0
6 004046 005067 026444      CLR   WORD
7 004052 016777 026440 026416 ST70:  MOV   WORD,BSPDR       ;LOAD REQUEST SCRATCH PAD
8 004060 052777 001000 026406   BIS   #B09,BSPAR
9 004066 012777 000377 026402   MOV   #377,BSPDR
10 004074 042777 001000 026372   BIC   #B09,BSPAR
11 004102 027727 026364 000377   CMP   BSPAR,#377       ;DONE.
12 004110 103005           BHIS  ST71
13 004112 005277 026356      INC   BSPAR
14 004116 105267 026374      INCB  WORD
15 004122 000753           BR    ST70
16 004124 005077 026344      ST71: CLR   BSPAR           ;NOW...CHECK IT
17 004130 005067 026362      CLR   WORD
18 004134 016767 026356 013734 ST80:  MOV   WORD,GOOD
19 004142 017767 026330 013730   MOV   BSPDR,BAD
20 004150 026767 013722 013722   CMP   GOOD,BAD
21 004156 001432           BEQ   ST81
22 004160           DATERR \N,ISATE       ;O.K, CONTINUE
                                   ;ERROR:REQ SCPD ADR TEST ERROR
                                   ;***** ERROR 6 *****

    004160 032777 040000 026312   BIT   #B14,BSR
    004166 001007           BNE   .+20
    004170 012700 026706      MOV   #ISATE,RO
    004174 012767 000006 013672   MOV   #6,ERRNUM
    004202 004767 013604      JSR   PC,DERR
    000007           N          =          N+1
23 004206 032777 040000 026264   BIT   #B14,BSR           ;PRINT ALLOWED?
24 004214 001010           BNE   ST80S             ;NO, SKIP IT
25 004216           PNTM   SCPAD
    004216 012700 024463      MOV   #SCPAD,RO         ;PRINT MESSAGE
    004222 004767 014330      JSR   PC,TYP0UT        ;POINTED TO BY SCPAD
26 004226 017700 026242      MOV   BSPAR,RO         ;PRINT SCPD ADDRESS OF ERROR
27 004232 004767 015350      JSR   PC,OCTPNT
28 004236           ST80S: SCOPE ST80
    004236 004567 013232      JSR   R5,SCPRTN
    004242 004134           ST80
29 004244 027727 026224 000377 ST81:  CMP   BSPAR,#377
30 004252 103005           BHIS  ST82
31 004254 005277 026214      INC   BSPAR
32 004260 105267 026232      INCB  WORD
33 004264 000723           BR    ST80
34 004266 012777 001000 026200 ST82:  MOV   #1000,BSPAR
35 004274 012767 000377 013574   MOV   #377,GOOD
36 004302 017767 026170 013570 ST90:  MOV   BSPDR,BAD
37 004310 026767 013562 013562   CMP   GOOD,BAD
38 004316 001432           BEQ   ST91
39 004320           DATERR \N,OSDTE   ;RES SCPD ALL 1'S?
                                   ;YES, O.K.
                                   ;ERROR:RESULT SCPD DATA TEST ERROR
                                   ;***** ERROR 7 *****

    004320 032777 040000 026152   BIT   #B14,BSR
    004326 001007           BNE   .+20
    004330 012700 026737      MOV   #OSDTE,RO
    004334 012767 000007 013532   MOV   #7,ERRNUM
    004342 004767 013444      JSR   PC,DERR
    000010           N          =          N+1

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 8 1
 MOST LOGIC TEST

40	004346	032777	040000	026124		BIT	#B14,BSR		;PRINT ALLOWED?
41	004354	001010				BNE	ST90S		;NO, SKIP IT
42	004356					PNTM	SCPAD		
	004356	012700	024463			MOV	#SCPAD,RO		;PRINT MESSAGE
	004362	004767	014170			JSR	PC,TYPOUT		;POINTED TO BY SCPAD
43	004366	017700	026102			MOV	BSPAR,RO		;PRINT SCPD ADDRESS OF ERROR
44	004372	004767	015210			JSR	PC,OCTPNT		
45	004376				ST90S:	SCOPE	ST90		
	004376	004567	013072			JSR	R5,SCPRTN		
	004402	004302				ST90			
46	004404	027727	026064	001377	ST91:	CMP	BSPAR,#1377		;ALL DONE?
47	004412	001403				BEQ	ST10		;IF YES, REVERSE IN & OUT
48	004414	005277	026054			INC	BSPAR		
49	004420	000730				BR	ST90		
50									
51	004422	012777	001000	026044	ST10:	MOV	#B09,BSPAR		;DO IT AGAIN WITH A SWITCH
52	004430	005067	026062			CLR	WORD		
53	004434	016777	026056	026034	ST100:	MOV	WORD,BSPDR		;COUNT DOWN UNTIL HALF-WAY
54	004442	042777	001000	026024		BIC	#R09,BSPAR		
55	004450	012777	000377	026020		MOV	#377,BSPDR		;AND LOAD REQ SCPD WITH 1'S
56	004456	052777	001000	026010		BIS	#B09,BSPAR		
57	004464	027727	026004	001377		CMP	BSPAR,#1377		;DONE?
58	004472	103005				BHIS	ST101		;YES
59	004474	005277	025774			INC	BSPAR		;NO, KEEP GOING DOWN
60	004500	105267	026012			INCB	WORD		
61	004504	000753				BR	ST100		
62	004506	012777	001000	025760	ST101:	MOV	#B09,BSPAR		;NOW, ...CHECK IT
63	004514	005067	025776			CLR	WORD		
64	004520	016767	025772	013350	ST110:	MOV	WORD,GOOD		
65	004526	017767	025744	013344		MOV	BSPDR,BAD		
66	004534	026767	013336	013336		CMP	GOOD,BAD		
67	004542	001432				BEQ	ST111		;OUT ADDR OK?
68	004544					DATERR	\N,OSATE		;ERROR:RESULT SCPD ADR TEST ERROR
									;***** ERROR 10 *****
	004544	032777	040000	025726		BIT	#B14,BSR		
	004552	001007				BNE	.20		
	004554	012700	026774			MOV	#OSATE,RO		
	004560	012767	000010	013306		MOV	#10,ERRNUM		
	004566	004767	013220			JSR	PC,DERR		
		000011			N	=	N+1		
69	004572	032777	040000	025700		BIT	#B14,BSR		;PRINT ALLOWED?
70	004600	001010				BNE	ST110S		;NO, SKIP IT
71	004602					PNTM	SCPAD		
	004602	012700	024463			MOV	#SCPAD,RO		;PRINT MESSAGE
	004606	004767	013744			JSR	PC,TYPOUT		;POINTED TO BY SCPAD
72	004612	017700	025656			MOV	BSPAR,RO		;PRINT SCPD ADR OF ERROR
73	004616	004767	014764			JSR	PC,OCTPNT		
74	004622				ST110S:	SCOPE	ST110		
	004622	004567	012646			JSR	R5,SCPRTN		
	004626	004520				ST110			
75	004630	027727	025640	001377	ST111:	CMP	BSPAR,#1377		
76	004636	103005				BHIS	ST112		
77	004640	005277	025630			INC	BSPAR		
78	004644	105267	025646			INCB	WORD		
79	004650	000723				BR	ST110		
80	004652	012767	000377	013216	ST112:	MOV	#377,GOOD		;NOW CHECK REQ SCPD
81	004660	005077	025610			CLR	BSPAR		

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 8 2
 MOST LOGIC TEST

82	004664	017767	025606	013206	ST120:	MOV	@SPDR,BAD	
83	004672	026767	013200	013200		CMP	GOOD,BAD	
84	004700	001432				BEQ	ST121	
85	004702					DATERR	\N,ISDTE	
	004702	032777	040000	025570		BIT	@B14,@SR	
	004710	001007				BNE	.+20	
	004712	012700	027030			MOV	@ISDTE,RO	
	004716	012767	000011	013150		MOV	@11,ERRNUM	
	004724	004767	013062			JSR	PC,DERR	
		000012			N	=	N+1	
86	004730	032777	040000	025542		BIT	@B14,@SR	
87	004736	001010				BNE	ST120S	
88	004740					PNTM	SCPAD	
	004740	012700	024463			MOV	@SCPAD,RO	
	004744	004767	013606			JSR	PC,TYPOUT	
89	004750	017700	025520			MOV	@SPAR,RO	
90	004754	004767	014626			JSR	PC,OCTPNT	
91	004760				ST120S:	SCOPE	ST120	
	004760	004567	012510			JSR	R5,SCPRTN	
	004764	004664				ST120		
92	004766	027727	025502	000377	ST121:	CMP	@SPAR,@377	
93	004774	001403				BEQ	ST13	
94	004776	005277	025472			INC	@SPAR	
95	005002	000730				BR	ST120	

;ALL 1'S?
 ;YES, CHECK THE REST
 ;ERROR:REQ SCPD DATA TEST ERR
 ;***** ERROR 11 *****

;PRINT ALLOWED?
 ;NO. SKIP IT

;PRINT MESSAGE
 ;POINTED TO BY SCPAD
 ;PRINT SCPD ADR OF ERROR

;DONE REQ SCPD?
 ;YES, CHECK CLR SC. PAD

;NO. KEEP CHECKING

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 9
MOST LOGIC TEST

```

1          ;CHECK CLEARING ALL SCRATCHPAD LOCATIONS
2          ; FILL THE ENTIRE SCPD WITH A CONSTANT (NORMALLY '0' )
3          ; AND THE CHECK IT.
4
5 005004 005077 025464          ST13: CLR      @SPAR          ;START AT 0
6 005010 012777 000000 025460 ST130: MOV     @0,@SPDR        ;THIS LOC (@0) CAN BE CHANGED
7 005016 027727 025452 000377          CMP     @SPAR,@377      ; TO ANYTHING AND THIS RTN
8 005024 001403          BEQ     ST131A         ; CAN BE USED FOR ANY DATA
9 005026 005277 025442          INC     @SPAR          ; FILL-UP & TEST
10 005032 000766          BR      ST130
11 005034 012777 001000 025432 ST131A: MOV   @B09,@SPAR      ;ADDR RES. SCPD
12 005042 012777 000000 025426 ST131B: MOV   @0,@SPDR        ;THIS "@0" MUST ALSO BE CHANGED
13 005050 027727 025420 001377          CMP     @SPAR,@1377
14 005056 001403          BEQ     ST131          ;FILL UP WHOLE RES. SCPD
15 005060 005277 025410          INC     @SPAR
16 005064 000766          BR      ST131B
17 005066 005077 025402          ST131: CLR     @SPAR          ;NOW CHECK IT
18 005072 012767 000000 012776          MOV     @0,GOOD        ;THIS LOC (@0) MUST BE CHANGED
19 005100 017767 025372 012772 ST132: MOV   @SPDR,BAD      ; TO CORRESPOND TO ST130
20 005106 026767 012764 012764          CMP     GOOD,BAD       ; IN ORDER TO CHECK THE
21 005114 001432          BEQ     ST133          ; CORRECT DATA FILL-UP
22 005116          DATERR  \N,RQSPCL  ;ERROR:REQ. SCPD NOT ALL 0'S
                                ;***** ERROR 12 *****

005116 032777 040000 025354          BIT     @B14,@SR
005124 001007          BNE     .+20
005126 012700 027062          MOV     @RQSPCL,RO
005132 012767 000012 012734          MOV     @12,ERRNUM
005140 004767 012646          JSR     PC,DERR
                                =
                                N+1
23 005144 032777 040000 025326          BIT     @B14,@SR          ;PRINT ALLOWED?
24 005152 001010          BNE     ST132S         ;NO, SKIP IT
25 005154          PNTM   SCPAD
005154 012700 024463          MOV     @SCPAD,RO          ;PRINT MESSAGE
005160 004767 013372          JSR     PC,TYP0UT        ;POINTED TO BY SCPAD
26 005164 017700 025304          MOV     @SPAR,RO          ;PRINT SCPD ADR OF ERROR
27 005170 004767 014412          JSR     PC,OCTPNT
28 005174          ST132S: SCOPE  ST13
005174 004567 012274          JSR     RS,SCPRTN
005200 005004          ST13
29 005202 027727 025266 000377 ST133: CMP     @SPAR,@377      ;DONE CHECKING REQ. SCPD?
30 005210 001404          BEQ     ST134          ;YES, CHECK RES. SCPD
31 005212 005277 025256          INC     @SPAR          ;NO, FINISH UP
32 005216 000167 177656          JMP     ST132
33 005222 012777 001000 025244 ST134: MOV   @1000,@SPAR      ;NOW CHECK RES. SCPD
34 005230 012767 000000 012640          MOV     @0,GOOD        ;THIS "@0" ALSO MUST BE CHANGED
35 005236 017767 025234 012634 ST135: MOV   @SPDR,BAD
36 005244 026767 012626 012626          CMP     GOOD,BAD
37 005252 001432          BEQ     ST136          ;RES SCPD ALL 0'S?
38 005254          DATERR  \N,RSSPCL  ;ERROR:RES. SCPD NOT ALL 0'S
                                ;***** ERROR 13 *****

005254 032777 040000 025216          BIT     @B14,@SR
005262 001007          BNE     .+20
005264 012700 027112          MOV     @RSSPCL,RO
005270 012767 000013 012576          MOV     @13,ERRNUM
005276 004767 012510          JSR     PC,DERR
                                =
                                N+1
39 005302 032777 040000 025170          BIT     @B14,@SR          ;PRINT ALLOWED?

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 9 1
MOST LOGIC TEST

40	005310	001010			BNE	ST135S		;NO, SKIP IT
41	005312				PNTM	SCPAD		
	005312	012700	024463		MOV	@SCPAD,RO		;PRINT MESSAGE
	005316	004767	013234		JSR	PC,TYPOUT		;POINTED TO BY SCPAD
42	005322	017700	025146		MOV	@SPAR,RO		;PRINT SCPD ADDR OF ERROR
43	005326	004767	014254		JSR	PC,OCTPNT		
44	005332				ST135S: SCOPE	ST13		
	005332	004567	012136		JSR	R5,SCPRTN		
	005336	005004			ST13			
45	005340	027727	025130	001377	ST136: CMP	@SPAR,#1377		;DONE RES. SCPD?
46	005346	001403			BEQ	ST14		;YES, NEXT ROUTINE
47	005350	005277	025120		INC	@SPAR		
48	005354	000730			BR	ST135		

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 10
MOST LOGIC TEST

```

1      ;TEST "CLR TOP BYTE"
2      ; SETTING "CL RTPB" SHOULD RESULT IN ALL BITS OF THE
3      ; HIGH BYTE OF THE CSR BEING CLEARED. (LOW BYTE ALREADY = 0)
4
5 005356 012777 000020 025046 ST14:  MOV    #B04,@CSR          ;SET "CL RTPB"
6 005364 005067 012506          CLR    GOOD              ;ALL CSR SHOULD BE 0
7 005370 017767 025036 012502  MOV    @CSR,BAD
8 005376 026767 012474 012474  CMP    GOOD,BAD         ;ALL CLEAR?
9 005404 001416          BEQ    ST15
10 005406          DATERR  \N,CLTBER      ;ERROR:CLR TPB FAILED
                                   ;***** ERROR 14 *****
    005406 032777 040000 025064      BIT    #B14,@SR
    005414 001007          BNE    .+20
    005416 012700 027142          MOV    @CLTBER,R0
    005422 012767 000014 012444  MOV    #14,ERRNUM
    005430 004767 012356          JSR    PC,DERR
    N      =      N+1
11 005434          SCOPE  ST14
    005434 004567 012034          JSR    R5,SCRPTN
    005440 005356          ST14
12
13      ;NOW H A N G AND CHECK CSR
14      ; "HANG" BY USING THE CMR-11 'DIE' FUNCTION
15      ; THEN CHECK THAT THE CSR WAS RIGHT
16      ; FOR THE 'DIE' FUNC. THEN CHECK ALL R/W BITS OF THE CSR
17
18 005442 005077 025026          ST15:  CLR    @SPAR          ;ADDR REQ. SCPD
19 005446 012777 000213 025022  MOV    #213,@SPDR       ;LOAD MAINT FUNC SUBF #3
20 005454 005277 025014          INC    @SPAR
21 005460 012777 000001 025010  MOV    #1,@SPDR         ;DATA LEN. = 1
22 005466 005277 025002          INC    @SPAR
23 005472 012777 000001 024776  MOV    #1,@SPDR         ;ONE REQUEST
24 005500 012777 000200 024724  MOV    #200,@CSR        ;SET "MAIN"SHD CAUSE U.P. HANG
25 005506 012767 007777 024714  MOV    #7777,CNTR       ;WAIT FOR THE MICRO
26 005514 005777 024712          1$:   TST    @CSR          ;MICRO DONE?
27 005520 100403          BMI    2$              ;NO, WAIT A BIT
28 005522 005367 024702          DEC    CNTR
29 005526 001372          BNE    1$
30 005530 012767 137600 012340  2$:   MOV    #137600,GOOD
31 005536 017767 024670 012334  MOV    @CSR,BAD
32 005544 026767 012326 012326  CMP    GOOD,BAD         ;READ CSR REGISTER
33 005552 001432          BEQ    ST16             ;DID IT HANG CORRECTLY?
34 005554 012767 000000 024646  MOV    #0,CNTR          ;YES, GOOD
35 005562          DATERR  \N,DIERR      ;ERROR:CSR NOT RIGHT FOR "DIE"
                                   ;***** ERROR 15 *****
    005562 032777 040000 024710      BIT    #B14,@SR
    005570 001007          BNE    .+20
    005572 012700 027204          MOV    @DIERR,R0
    005576 012767 000015 012270  MOV    #15,ERRNUM
    005604 004767 012202          JSR    PC,DERR
    N      =      N+1
36 005610 012777 000002 024614  ST150: MOV    #2,@CSR          ;PROGRAM INIT
37 005616 005367 024606          DEC    CNTR            ;WAIT FOR INIT
38 005622 001375          BNE    ST150
39 005624 012777 000020 024600  MOV    #B04,@CSR        ;CLR TOP BYTE
40 005632 004567 011636          SCOPE  ST15
    005632 004567 011636          JSR    R5,SCRPTN

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J3

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 10-1
MOST LOGIC TEST

SEQ 0035

005636 005442

ST15

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 11
 MOST LOGIC TEST

```

1          ;CHECK CSR WITH MICRO HUNG
2
3 005640 012767 137755 012230 ST16:  MOV    #137755,GOOD          ;CHECK R/W BITS OF CSR
4 005646 012777 000355 024556      MOV    #355,BCSR
5 005654 017767 024552 012216      MOV    @BCSR,BAD
6 005662 026767 012210 012210      CMP    GOOD,BAD          ;DO THEY SET?
7 005670 001416                BEQ    ST160             ;YES, TRY CLEARING THEM
8 005672                DATERR  \N,CSRWE          ;ERROR:BAD BITS IN CSR WHILE HUNG
                                ;***** ERPOR 16 *****

    005672 032777 040000 024600      BIT    #B14,BSR
    005700 001007                BNE    .+20
    005702 012700 027237                MOV    @CSRWE,R0
    005706 012767 000016 012160      MOV    #16,ERRNUM
    005714 004767 012072                JSR    PC,DERR
                                =
                                N+1
9 005720                SCOPE  ST16
    005720 004567 011550                JSR    R5,SCPRTN
    005724 005640                ST16

10 005726 012767 137400 012142 ST160: MOV    #137400,GOOD          ;NOW, SEE IF THEY CLEAR
11 005734 012777 000000 024470      MOV    #0,BCSR
12 005742 017767 024464 012130      MOV    @BCSR,BAD
13 005750 026767 012122 012122      CMP    GOOD,BAD          ;DID THEY CLR?
14 005756 001416                BEQ    ST161             ;YES, NEXT
15 005760                DATERR  \N,CSRCE          ;ERROR:CAN'T CLR LOW CSR WHILE HUNG
                                ;***** ERROR 17 *****

    005760 032777 040000 024512      BIT    #B14,BSR
    005766 001007                BNE    .+20
    005770 012700 027271                MOV    @CSRCE,R0
    005774 012767 000017 012072      MOV    #17,ERRNUM
    006002 004767 012004                JSR    PC,DERR
                                =
                                N+1
16 006006                SCOPE  ST160
    006006 004567 011462                JSR    R5,SCPRTN
    006012 005726                ST160

17 006014 012777 000200 024410 ST161: MOV    #200,BCSR          ;CHECK ACCESS KEYS TO SCPD
18 006022 012777 000200 024444      MOV    #200,@SPAR        ;WITH MAIN SET
19 006030 017767 024442 024460      MOV    @SPDR,WORD        ;READ AN REQ SCPD WORD
20 006036 005167 024454                COM    WORD              ;COMPLEMENT IT
21 006042 042767 177400 024446      BIC    #177400,WORD      ;FORGET TOP BYTE
22 006050 016777 024442 024420      MOV    WORD,@SPDR        ;WRITE COMPL. BACK
23 006056 027767 024414 024432      CMP    @SPDR,WORD        ;READ IT BACK AGAIN
24 006064 001016                BNE    ST162             ;IT SHOULDN'T BE THE SAME
25 006066                ERROR   \N,SPAVME          ;ERROR:ACCESSED REQ SCPD WITH "MAIN" SET
                                ;***** ERROR 20 *****

    006066 032777 040000 024404      BIT    #B14,BSR
    006074 001007                P &E    .+20
    006076 012700 027330                MOV    @SPAVME,R0
    006102 012767 000020 011764      MOV    #20,ERRNUM
    006110 004767 011612                JSR    PC,ERR
                                =
                                N+1
26 006114                SCOPE  ST161
    006114 004567 011354                JSR    R5,SCPRTN
    006120 006014                ST161

27 006122 012777 000001 024302 ST162: MOV    #1,BCSR          ;TRY AGAIN WITH "ST FUN" SET
28 006130 012777 000200 024336      MOV    #200,@SPAR
29 006136 017767 024334 024352      MOV    @SPDR,WORD
30 006144 005167 024346                COM    WORD              ;READ A REQ SCPD WORD
                                ;COMPLEMENT IT

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 11 1
MOST LOGIC TEST

31	006150	042767	177400	024340	BIC	#177400,WORD	;FORGET TOP BYTE
32	006156	016777	024334	024312	MOV	WORD,@SPDR	;WRITE IT BACK
33	006164	026777	024326	024304	CMP	WORD,@SPDR	;READ IT BACK AGAIN
34	006172	001016			BNE	ST17	;IT SHOULDN'T BE THE SAME
35	006174				ERROR	\N,SPAVFE	;ERROR:ACCESSED REQ SCPD WITH "STFUN" SET
	006174	032777	040000	024276	BIT	#B14,@SR	;***** ERROR 21 *****
	006202	001007			BNE	.+20	
	006204	012700	027374		MOV	@SPAVFE,R0	
	006210	012767	000021	011656	MOV	#21,ERRNUM	
	006216	004767	011504		JSR	PC,ERR	
		000022			=	N+1	
36	006222				SCOPE	ST162	
	006222	004567	011246		JSR	R5,SCPRTN	
	006226	006122			ST162		

CZCMJCO CMR(V) 11 HOST EXERCISE MACRO V04.00 02:24:05 PAGE 12
 HOST LOGIC TEST

```

1          ;TEST INTERRUPT WITH MICRO HUNG
2
3 006230 012777 006342 024262 ST17:  MOV    #ERINT,@VECTOR    ;SET UP VECTOR FOR ERROR
4 006236                                MTPS    #0              ;ALLOW INTERRUPTS
   006236 012746 000000                MOV    #0,-(SP)
   006242 012746 006250                MOV    #64,-(SP)
   006246 000002                                RTI
   006250                                64$:
5 006250 000240                                NOP                                ;IF ONE OCCURS NOW, IT
6 006252 000240                                NOP                                ; IS ERRONEOUS.
7 006254 012777 006404 024236 ST170: MOV    #GDINT,@VECTOR    ;SET VECTOR FOR GOOD INTERRUPT
8 006262 012777 000100 024142        MOV    #100,BCSR    ;SET INTR ENABLE
9 006270 000240                                NOP                                ;IF ONE DOES NOT OCCUR NOW,
10 006272 000240                                NOP                                ; THERE IS AN ERROR
11 006274                                ERROR   \N,NOINTR    ;ERROR:HOST CAN'T INTERRUPT UNIBUS
                                   ;***** ERROR 22 *****
   006274 032777 040000 024176        BIT    #B14,BSR
   006302 001007                                BNE    .+20
   006304 012700 027441                MOV    #NOINTR,R0
   006310 012767 000022 011556        MOV    #22,ERRNUM
   006316 004767 011404                JSR    PC,ERR
                                   =
12 006322 042777 000100 024102        N          BIC    #100,BCSR    ;CLEAR INTR ENAB
13 006330                                SCOPE  ST170
   006330 004567 011140                JSR    R5,SCPRTN
   006334 006254                                ST170
14 006336 000167 000054        ST170R:  JMP    INTCNT        ;CONTINUE
15 006342 022626        ERINT:  CMP    (SP)+,(SP)+    ;POP-POP STACK
16 006344                                ERROR   \N,ERINTR    ;ERROR:ERRONEOUS HOST INTERRUPT
                                   ;***** ERROR 23 *****
   006344 032777 040000 024126        BIT    #B14,BSR
   006352 001007                                BNE    .+20
   006354 012700 027477                MOV    #ERINTR,R0
   006360 012767 000023 011506        MOV    #23,ERRNUM
   006366 004767 011334                JSR    PC,ERR
                                   =
17 006372                                N          SCOPE  ST17
   006372 004567 011076                JSR    R5,SCPRTN
   006376 006230                                ST17
18 006400                                GDINT:  JMP    ST170        ;CONTINUE
19 006404 012716 006336                MOV    #ST170R,(SP)    ;CHANGE RETURN ADDRESS
20 006410 005077 024016                CLR    BCSR           ;CLEAR INTR ENAB
21 006414 000002                                RTI           ;CONTINUE
22 006416 012777 006462 024074 INTLNT:  MOV    #ERINT1,@VECTOR    ;SET UP FOR 2ND ERR INTR
23 006424 042777 000100 024000        BIC    #100,BCSR    ;CLEAR INTER ENAB
24 006432                                MTPS    PRIO         ;SET C.P AT DEVICE PRIORITY
   006432 016746 024022                MOV    PRIO,-(SP)
   006436 012746 006444                MOV    #64,-(SP)
   006442 000002                                RTI
   006444                                64$:
25 006444 012777 000100 023760        MOV    #100,BCSR    ;SET INTR ENAB
26 006452 000240                                NOP                                ;NO INTERRUPT SHOULD OCCUR
27 006454 000240                                NOP                                ; THIS TIME.
28 006456 000167 000046        INTCNR:  JMP    ST18        ;O.K. CONTINUE
29 006462 022626        ERINT1:  CMP    (SP)+,(SP)+    ;POP-POP STACK
30 006464 005077 023742                CLR    BCSR           ;CLEAR INTR ENAB
31 006470                                ERROR   \N,WPODI    ;ERROR:WRONG PRIORITY,DEVICE IS HIGHER

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 12 1
MOST LOGIC TEST

;***** ERROR 24 *****

006470	032777	040000	024002	BIT	#B14,BSR
006476	001007			BNE	.+20
006500	012700	027532		MOV	#WPODI,RO
006504	012767	000024	011362	MOV	#24,ERRNUM
006512	004767	011210		JSR	PC,ERR
	000025		N	=	N+1
32	006516			SCOPE	INTCNT
	006516	004567	010752	JSR	R5,SCPRTN
	006522	006416		INTCNT	
33	006524	000167	000000	JMP	ST18

CZCMLCO CHR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 13
MOST LOGIC TEST

```

1
2
3
4 006530 012777 000002 023674 ST18: MOV #2,BCSR ;DO MOST "INIT"
5 006536 012767 000024 023664 MOV #24,CNTR ;D.W 001
6 006544 005367 023660 MOV: DEC CNTR ;D.W 001
7 006550 001375 BNE MOV ;D.W 001
8 006552 012767 002000 011316 MOV #2000,GOOD ;WAIT A BIT
9 006560 017767 023646 011312 MOV BCSR,BAD ;PWR-UP SHOULD BE SET
10 006566 042767 100000 011304 BIC #B15,BAD ;READ CSR
11 006574 026767 011276 011276 CMP GOOD,BAD ;HAVE TO IGNORE B15 FOR SLOW POP 11 5;D.W 001
12 006602 001416 BEQ ST180 ;CSR CORRECT AFTER INIT?
13 006604 DATERR \N,HITER ;YES, CONTINUE
;ERROR:PROGRAM INIT FAILED
;***** ERROR 25 *****

006604 032777 040000 023666 BIT #B14,BSR
006612 001007 BNE .+20
006614 012700 027573 MOV #HITER,RO
006620 012767 000025 011246 MOV #25,ERRNUM
006626 004767 011160 JSR PC,DERR
- N -
14 006632 SCOPE ST18
006632 004567 010636 JSR R5,SCPRTN
006636 006530 ST18
15 006640 032777 100000 023564 ST180: BIT #B15,BCSR ;WAIT FOR PWR-UP COMPL
16 006646 001774 BEQ ST180
17 006650 012777 001000 023616 MOV #1000,BSPAR ;NOW READY TO READ VERSION
18 006656 012701 032326 MOV #OVERSP,R1 ;POINT AT ORIGINAL VERSION
19 006662 012702 032350 MOV #OVERSUN,R2 ;AND SAVE THIS VERSION
20 006666 117712 023604 ST181: MOVB BSPDR,(R2)
21 006672 001016 BNE ST182
22 006674 ERROR \N,VISF ;ERROR:MICRO DIDN'T STORE VERSION STUFF
;***** ERROR 26 *****

006674 032777 040000 023576 BIT #B14,BSR
006702 001007 BNE .+20
006704 012700 027633 MOV #VISF,RO
006710 012767 000026 011156 MOV #26,ERRNUM
006716 004767 011004 JSR PC,ERR
- N -
23 006722 SCOPE ST180
006722 004567 010546 JSR R5,SCPRTN
006726 006640 ST180
24 006730 111167 011142 ST182: MOVB (R1),GOOD ;NOW COMPARE VERSION WITH ORIG.
25 006734 111267 011140 MOVB (R2),BAD
26 006740 042767 177400 011130 BIC #177400,GOOD ;CLR TOP BYTE
27 006746 042767 177400 011124 BIC #177400,BAD
28 006754 026767 011116 011116 CMP GOOD,BAD ;SAME AS FIRST TIME?
29 006762 001416 BEQ ST183
30 006764 DATERR \N,VIDER ;ERROR:2ND VERSION NOT SAME AS 1ST
;***** ERROR 27 *****

006764 032777 040000 023506 BIT #B14,BSR
006772 001007 BNE .+20
006774 012700 027673 MOV #VIDER,RO
007010 012767 000027 011066 MOV #27,ERRNUM
007066 004767 011000 JSR PC,DERR
- N -
31 007012 SCOPE ST182
007012 004567 010456 JSR R5,SCPRTN

```

```

    007016 006730
32 007020 122122
33 007022 327727 023446 001020
34 007030 001403
35 007032 005277 023436
36 007036 000713
37
38
39
40
41
42 007040 012777 000020 023364
43 007046 012777 001200 023420
44 007054 017767 023416 023434
45 007062 005167 023430
46 007066 042767 177400 023422
47 007074 016777 023416 023374
48 007102 026777 023410 023366
49 007110 001016
50 007112

    007112 032777 040000 023360
    007120 001007
    007122 012700 027742
    007126 012767 000030 010740
    007134 004767 010566
    000031
51 007140
    007140 004567 010330
    007144 007040
52

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ST183: ST182
 CMPB (R1), (R2), ;UPDATE POINTERS
 CMP @SPAR, #1020 ;DONE?
 BEQ ST19
 INC @SPAR ;NEXT WORD
 BR ST181

;CHECK ACCESS TO RESULT SCPD WITH INTERRUPT CLEAR

ST19: MOV #20, BCSR ;CLEAR TOP BYTE OF CSR
 MOV #1200, @SPAR ;ADDRESS RESULT SCPD
 MOV @SPDR, WORD ;READ A WORD FROM IT
 COM WORD ;COMPLEMENT IT
 BIC #177400, WORD ;IGNORE TOP 8 BITS
 MOV WORD, @SPDR ;AND WRITE IT BACK
 CMP WORD, @SPDR ;NOW READ IT BACK
 BNE ST20 ;IT SHOULDN'T BE THE SAME
 ERROR \N, SPAVIC ;ERROR: RES. SCR. PAD ACCESSED WITH INTR CLR
 ;***** ERROR 30 *****

N
 BIT #B14, BSR
 BNE .+20
 MOV @SPAVIC, R0
 MOV #30, ERRNUM
 JSR PC, ERR
 =
 N+1
 SCOPE ST19
 JSR R5, SCPRTN
 ST19

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 14
 MOST LOGIC TEST

```

1
2
3
4
5
6
7
8 007146 012767 000000 023254 ST20:  MOV    #0,CNTR
9 007154 012777 000020 023250      MOV    #20,BCSR           ;CLEAR TOP BYTE
10 007162 005077 023306      CLR    BSPAR             ;ADDRESS REQ SCPD
11 007166 012777 000210 023302      MOV    #210,BSPDR        ;LOAD "MAIN" FUNCTION
12 007174 005277 023274      INC    BSPAR             ; TO EXAMINE MOST
13 007200 012777 000004 023270      MOV    #4,BSPDR          ; MEMORY LOCATIONS
14 007206 005277 023262      INC    BSPAR
15 007212 012777 000001 023256      MOV    #1,BSPDR          ;ONE REQUEST
16 007220 005277 023250      INC    BSPAR
17 007224 012777 000002 023244      MOV    #2,BSPDR          ;# OF BYTES TO READ = 2
18 007232 005277 023236      INC    BSPAR
19 007236 012777 000377 023232      MOV    #377,BSPDR        ;START ADDR = DFFF (H)
20 007244 005277 023224      INC    BSPAR
21 007250 012777 000337 023220      MOV    #337,BSPDR
22 007256 012777 000001 023146 ST200:  MOV    #1,BCSR           ;SET "ST FUN" ON "MAINT" FUNC
23 007264 012767 140000 010604      MOV    #B14-B15,GOOD     ;CHECK FOR FUNCOM & INTR
24 007272 017767 023134 010600 ST201:  MOV    BCSR,BAD
25 007300 026767 010572 010572      CMP    GOOD,BAD          ;"FUNCOM" AND "INTR" SET?
26 007306 001421      BEQ    ST202
27 007310 005367 023114      DEC    CNTR              ;IF NOT, WAIT A BIT
28 007314 001366      BNE    ST201
29 007316      DATERR \N,STESTF      ;ERROR:STATUS WRONG WITH "STFUN" ON "MAIN"
                          ;***** ERROR 31 *****

    007316 032777 040000 023154      BIT    #B14,BSR
    007324 001007      BNE    .+20
    007326 012700 030005      MOV    #STESTF,R0
    007332 012767 000031 010534      MOV    #31,ERRNUM
    007340 004767 010446      JSR    PC,DERR
    000032      =
    N
30 007344      SCOPE ST20
    007344 004567 010124      JSR    R5,SCPRTN
    007350 007146      ST20
31 007352 012777 001000 023114 ST202:  MOV    #1000,BSPAR        ;ADDRESS RESULT SCPD
32 007360 012767 000210 010510      MOV    #210,GOOD         ;CHECK ON FUNCTION
33 007366 017767 023104 010504      MOV    BSPDR,BAD
34 007374 026767 010476 010476      CMP    GOOD,BAD          ;FUNCTION CORRECT?
35 007402 001416      BEQ    ST203
36 007404      DATERR \N,RSPEF      ;ERROR:RESULT FUNC. CODE WRONG ON MAIN
                          ;***** ERROR 32 *****

    007404 032777 040000 023066      BIT    #B14,BSR
    007412 001007      BNE    .+20
    007414 012700 030036      MOV    #RSPEF,H0
    007420 012767 000032 010446      MOV    #32,ERRNUM
    007426 004767 010360      JSR    PC,DERR
    000033      =
    N
37 007432      SCOPE ST20
    007432 004567 010036      JSR    R5,SCPRTN
    007436 007146      ST20
38 007440 012777 001002 023026 ST203:  MOV    #1002,BSPAR        ;NOW ADDRESS "USOF"
39 007446 012767 000377 010422      MOV    #377,GOOD         ;SHOULD SHOW "TOTAL FAILURE" CODE

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 14-1
 MOST LOGIC TEST

40	007454	017767	023016	010416	MOV	@SPDR,BAD			
41	007462	026767	010410	010410	CMP	GOOD,BAD			;USOF O.K.?
42	007470	001416			BEQ	ST204			
43	007472				DATERR	\N,USOFE1			;ERROR:"STFUN" ON "MAIN" GAVE BAD USOF
									;***** ERROR 33 *****
	007472	032777	040000	023000	BIT	@B14,BSR			
	007500	001007			BNE	.+20			
	007502	012700	030077		MOV	@USOFE1,R0			
	007506	012767	000033	010360	MOV	@33,ERRNUM			
	007514	004767	010272		JSR	PC,DERR			
		000034			=	N+1			
44	007520				N	SCOPE	ST20		
	007520	004567	007750		JSR	R5,SCPRTN			
	007524	007146			ST20				
45	007526	012767	000000	022674	ST204:	MOV	@0,CNTR		
46	007534	012777	000020	022670	MOV	@20,BCSR			;SET "CLRTPB"
47	007542	012777	000200	022662	MOV	@200,BCSR			;SET "MAIN" WITH SAME FUN LOADED
48	007550	012767	140000	010320	MOV	@B14+B15,GOOD			;CHECK FOR "FUNCOM" & "INTR"
49	007556	017767	022650	010314	ST205:	MOV	BCSR,BAD		
50	007564	026767	010306	010306	CMP	GOOD,BAD			;FUN COMPLETE?
51	007572	001421			BEQ	ST206			
52	007574	005367	022630		DEC	CNTR			;WAIT A BIT
53	007600	001366			BNE	ST205			
54	007602				DATERR	\N,STEMF			;ERROR:STATUS WRONG ON "MAIN" FUNC
									;***** ERROR 34 *****
	007602	032777	040000	022670	BIT	@B14,BSR			
	007610	001007			BNE	.+20			
	007612	012700	030140		MOV	@STEMF,R0			
	007616	012767	000034	010250	MOV	@34,ERRNUM			
	007624	004767	010162		JSR	PC,DERR			
		000035			=	N+1			
55	007630				N	SCOPE	ST204		
	007630	004567	007640		JSR	R5,SCPRTN			
	007634	007526			ST204				
56	007636	012777	001002	022630	ST206:	MOV	@1002,BSPAR		;POINT AT "USOF"
57	007644	012767	000001	010224	MOV	@1,GOOD			;SHOULD SHOW SUCCESS
58	007652	017767	022620	010220	MOV	@SPDR,BAD			
59	007660	026767	010212	010212	CMP	GOOD,BAD			;USOF O.K.?
60	007666	001416			BEQ	ST207			
61	007670				DATERR	\N,USOFE2			;ERROR:BAD "USOF" ON "MAIN" FUNCTION
									;***** ERROR 35 *****
	007670	032777	040000	022602	BIT	@B14,BSR			
	007676	001007			BNE	.+20			
	007700	012700	030171		MOV	@USOFE2,R0			
	007704	012767	000035	010162	MOV	@35,ERRNUM			
	007712	004767	010074		JSR	PC,DERR			
		000036			=	N+1			
62	007716				N	SCOPE	ST204		
	007716	004567	007552		JSR	R5,SCPRTN			
	007722	007526			ST204				
63	007724	012777	001001	022542	ST207:	MOV	@1001,BSPAR		;POINT AT DATA LENGTH
64	007732	012767	000003	010136	MOV	@3,GOOD			;SHOULD BE 3
65	007740	017767	022532	010132	MOV	@SPDR,BAD			
66	007746	026767	010124	010124	CMP	GOOD,BAD			;WAS IT 3?
67	007754	001416			BEQ	ST21			
68	007756				DATERR	\N,DATLER			;ERROR:"MAIN" FUNC GAVE BAD DATA LEN.
									;***** ERROR 36 *****

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 14-2
 MOST LOGIC TEST

007756	032777	040000	022514	BIT	#B14,BSR	
007764	001007			BNE	.+20	
007766	012700	030226		MOV	#DATLER,RO	
007772	012767	000036	010074	MOV	#36,FRRNUM	
010000	004767	010006		JSR	PC,DERR	
	000037			=	N+1	
69	010004			SCOPE	ST204	
	010004	004567	007464	JSR	R5,SCPRTN	
	010010	007526		ST204		
70	010012	012700	032422	ST21:	MOV	#BAUD,RO
71	010016	012777	001003	022450	MOV	#1003,BSPAR
72	010024	117720	022446		MOVB	BSPDR,(RO)+
73	010030	005277	022440		INC	BSPAR
74	010034	117710	022436		MOVB	BSPDR,(RO)

;POINT AT BAUD TABLE
 ;GET RESULTS OF EXAMINE
 ;STORE BAUD RATES

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 15
 MOST LOGIC TEST

```

1
2
3
4
5 010040 012777 000020 022364 ST22:  MOV    #20,BCSR           ;CLEAR TOP BYTE OF CSR
6 010046 012777 000000 022420      MOV    #0,BSPAR
7 010054 012777 000060 022414      MOV    #60,BSPDR           ;LOAD "ACTIVATE REMOTE" FUNC
8 010062 005277 022406      INC    BSPAR
9 010066 012777 000002 022402      MOV    #2,BSPDR           ;DATA LEN. = 2
10 010074 005277 022374      INC    BSPAR
11 010100 012777 000001 022370      MOV    #1,BSPDR           ;ONE REQUEST
12 010106 005277 022362      INC    BSPAR
13 010112 012777 000001 022356      MOV    #1,BSPDR           ;REMOTE #1
14 010120 012777 000200 022304 ST220: MOV    #200,BCSR        ;SET "MAIN"
15 010126 032777 040000 022276 ST221: BIT    #B14,BCSR        ;FUNC. COMPL?
16 010134 001774      BEQ    ST221              ;NO, WAIT
17 010136 012777 001000 022330      MOV    #1000,BSPAR        ;ADDRESS RESULT
18 010144 017767 022326 007726      MOV    BSPDR,BAD          ;READ RESULT FUNC. CODE
19 010152 012767 000060 007716      MOV    #60,GOOD
20 010160 026767 007712 007712      CMP    GOOD,BAD           ;O.K.?
21 010166 001416      BEQ    ST222
22 010170      DATERR \N,RSPENF        ;ERROR:RES. FUNC. CODE WRONG FOR "MAIN"
                                ;***** ERROR 37 *****

    010170 032777 040000 022302      BIT    #B14,BSR
    010176 001007      BNE    .+20
    010200 012700 030266      MOV    #RSPENF,R0
    010204 012767 000037 007662      MOV    #37,ERRNUM
    010212 004767 007574      JSR    PC,DERR
                                =
                                N+1
23 010216      SCOPE ST22
    010216 004567 007252      JSR    R5,SCPRTN
    010222 010040      ST22
24 010224 012777 001002 022242 ST222: MOV    #1002,BSPAR        ;ADDR "USOF"
25 010232 012767 000377 007636      MOV    #377,GOOD         ;SHOULD SHOW TOTAL FAILURE
26 010240 017767 022232 007632      MOV    BSPDR,BAD
27 010246 026767 007624 007624      CMP    GOOD,BAD         ;USOF O.K.?
28 010254 001416      BEQ    ST223
29 010256      DATERR \N,USOF E3      ;ERROR:"MAIN" ON REG FUNC GAVE WRONG USOF
                                ;***** ERROR 40 *****

    010256 032777 040000 022214      BIT    #B14,BSR
    010264 001007      BNE    .+20
    010266 012700 030330      MOV    #USOF E3,R0
    010272 012767 000040 007574      MOV    #40,ERRNUM
    010300 004767 007506      JSR    PC,DERR
                                =
                                N+1
30 010304      SCOPE ST22
    010304 004567 007164      JSR    R5,SCPRTN
    010310 010040      ST22
31 010312 012777 000020 022112 ST223: MOV    #20,BCSR           ;CLR TOP BYTE
32 010320 012777 000001 022104      MOV    #1,BCSR           ;SET "STFUN"
33 010326 032777 040000 022076 ST224: BIT    #B14,BCSR        ;FUNCOM SET?
34 010334 001774      BEQ    ST224             ;WAIT
35 010336 012777 001002 022130      MOV    #1002,BSPAR        ;ADDRESS USOF
36 010344 012767 000364 007524      MOV    #364,GOOD         ;SHOULD SHOW REM. ERROR
37 010352 017767 022120 007520      MOV    BSPDR,BAD
38 010360 026767 007512 007512      CMP    GOOD,BAD         ;USOF O.K.?
39 010366 001416      BEQ    ST23

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 15 1
MOST LOGIC TEST

40 010370

DATERR \N,USOFE4

;ERROR:WRONG USOF ON REGULAR FUNCTION
;***** ERROR 41 *****

010370 032777 040000 022102
010376 001007
010400 012700 030373
010404 012767 000041 007462
010412 004767 007374
000042

BIT #B14,BSR
BNE .+20
MOV #USOFE4,R0
MOV #41,ERRNUM
JSR PC,DERR
=
SCOPE ST223
JSR R5,SCPRTN
ST223

N

41 010416

010416 004567 007052
010422 010312

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 16
 MOST LOGIC TEST

```

1          ;END OF LOGIC TEST. PRINT END OF PASS AND VERSION STUFF
2
3
4 010424 005767 022064      ST23:  TST      VERFLG      ;IS FLAG SET?
5 010430 001402              BEQ      ST23A      ;NO
6 010432 000167 000350      JMP      ST24      ;YES, JUST PRINT "END PASS"
7 010436 012767 177777 022050 ST23A:  MOV      #-1,VERFLG ;NO, SET FLAG
8 010444 012701 032350      MOV      @VERSUN,R1 ;GET VERSION DATA
9 010450 012702 032422      MOV      @BAUD,R2   ;AND BAUD RATES
10 010454              PNTM     VERSM      ;PRINT "VERSION "
    010454 012700 024504      MOV      @VERSM,R0 ;PRINT MESSAGE
    010460 004767 010072      JSR     PC, TYPOUT ;POINTED TO BY VERSM
11 010464 012767 000021 021736      MOV      #21,CNTR
12 010472 112100              ST230:  MOVB     (R1)+,R0 ;DUMP ALL VERSION INFO
13 010474 004767 011422      JSR     PC, TIO
14 010500 005367 021724      DEC     CNTR
15 010504 001372              BNE     ST230
16 010506              PNTM     BAUDM      ;PRINT "BAUD RATES:"
    010506 012700 024537      MOV      @BAUDM,R0 ;PRINT MESSAGE
    010512 004767 010040      JSR     PC, TYPOUT ;POINTED TO BY BAUDM
17 010516              PNTM     PORTOM     ;PRINT "PORT 0 = "
    010516 012700 024555      MOV      @PORTOM,R0 ;PRINT MESSAGE
    010522 004767 010030      JSR     PC, TYPOUT ;POINTED TO BY PORTOM
18 010526 111267 021764              MOVB     (R2),WORD
19 010532 042767 177617 021756      BIC     #177617,WORD ;SORT OUT CORRECT PART
20 010540 006267 021752      ASR     WORD
21 010544 006267 021746      ASR     WORD
22 010550 006267 021742      ASR     WORD ;PUT IT IN L.S. BIT PLACES
23 010554 006267 021736      ASR     WORD
24 010560 012703 031144      MOV      @BDRTBL,R3 ;R3 POINTS AT TABLE OF RATES
25 010564 006367 021726      ASL     WORD ;DOUBLE OFFSET
26 010570 066703 021722      ADD     WORD,R3   ;USE CORRECT OFFSET
27 010574 011300              MOV      (R3),R0  ;GET BAUD
28 010576 004767 007754      JSR     PC, TYPOUT
29 010602              PNTM     PORT1M     ;NOW PRINT "PORT 1 = "
    010602 012700 024571      MOV      @PORT1M,R0 ;PRINT MESSAGE
    010606 004767 007744      JSR     PC, TYPOUT ;POINTED TO BY PORT1M
30 010612 112267 021700      MOVB     (R2)+,WORD ;GET NEXT BAUD RATE CODE
31 010616 042767 177770 021672      BIC     #177770,WORD ;SORT OUT CORRECT BAUD RATE
32 010624 012703 031144      MOV      @BDRTBL,R3
33 010630 006367 021662      ASL     WORD ;DOUBLE OFFSET
34 010634 066703 021656      ADD     WORD,R3   ;USE IT AS TABLE OFFSET
35 010640 011300              MOV      (R3),R0
36 010642 004767 007710      JSR     PC, TYPOUT
37 010646              PNTM     PORT2M     ;PRINT RATE FOR PORT 1
    010646 012700 024605      MOV      @PORT2M,R0 ;PRINT "PORT 2 = "
    010652 004767 007700      JSR     PC, TYPOUT ;PRINT MESSAGE
    010656 111267 021634      MOVB     (R2),WORD ;POINTED TO BY PORT2M
38 010662 042767 177617 021626      BIC     #177617,WORD ;GET BAUD RATE CODE
39 010670 006267 021622      ASR     WORD ;GET CORRECT PART.
40 010674 006267 021616      ASR     WORD
41 010674 006267 021616      ASR     WORD
42 010700 006267 021612      ASR     WORD
43 010704 006267 021606      ASR     WORD
44 010710 012703 031144      MOV      @BDRTBL,R3
45 010714 006367 021576      ASL     WORD ;DOUBLE OFFSET
46 010720 066703 021572      ADD     WORD,R3   ;USE IT AS TABLE OFFSET
47 010724 011300              MOV      (R3),R0

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 16 1
 MOST LOGIC TEST

48	010726	004767	007624		JSR	PC, TYP0UT		;PRINT BAUD RATE FOR PORT 2
49	010732				PNTM	PORT3M		;PRINT "PORT 3 = "
	010732	012700	024621		MOV	#PORT3M, R0		;PRINT MESSAGE
	010736	004767	007614		JSR	PC, TYP0UT		;POINTED TO BY PORT3M
50	010742	111267	021550		MOVB	(R2), WORD		
51	010746	042767	177770	021542	BIC	#177770, WORD		;SORT OUT CORRECT PART
52	010754	012703	031144		MOV	#BDRTBL, R3		
53	010760	006367	021532		ASL	WORD		;DOUBLE OFFSET
54	010764	066703	021526		ADD	WORD, R3		;USE IT AS TABLE OFFSET
55	010770	011300			MOV	(R3), R0		
56	010772	004767	007560		JSR	PC, TYP0UT		;PRINT RATE FOR PORT 3
57	010776	004767	010766		JSR	PC, NULLS		;NULLS AFTER PRINTOUT
58	011002	000167	000016		JMP	ST25		
59								
60	011006	005367	021426	ST24:	DEC	ITER		;UPDATE ITERATION
61	011012	001404			BEQ	ST25		;DONE 10?
62	011014	032777	004000	021456	BIT	#B11, BSR		;SINGLE ITERATION?
63	011022	001417			BEQ	ST26		
64	011024	012767	000010	021406	ST25:	MOV	#10, ITER	
65	011032	005267	021410		INC	PASCNT		;UPDATE PASS COUNT
66	011036	032777	002000	021434	BIT	#B10, BSR		;END PASS INHIBIT?
67	011044	001006			BNE	ST26		
68	011046	004767	010716		JSR	PC, NULLS		;NULLS BEFORE PRINTOUT ;D.W 001
69	011052	004767	000014		JSR	PC, ENPRTN		;PRINT END PASS INFO
70	011056	004767	010706		JSR	PC, NULLS		;NULLS AFTER PRINTOUT
71	011062	004767	007064	ST26:	JSR	PC, MONIT		;CHECK FOR CONTROL CHARACTERS
72	011066	000167	172200		JMP	ST0		;START OVER
73								
74								
75	011072			ENPRTN:	PNTM	ENDPS		;PRINT "END PASS # "
	011072	012700	024635		MOV	#ENDPS, R0		;PRINT MESSAGE
	011076	004767	007454		JSR	PC, TYP0UT		;POINTED TO BY ENDPS
76	011102	016700	021340		MOV	PASCNT, R0		;GET PASS COUNT
77	011106	004767	010600		JSR	PC, DECPNT		;PRINT IT IN DECIMAL
78	011112				PNTM	ERCTM		;PRINT "ERROR COUNT = "
	011112	012700	024664		MOV	#ERCTM, R0		;PRINT MESSAGE
	011116	004767	007434		JSR	PC, TYP0UT		;POINTED TO BY ERCTM
79	011122	105767	021257		TSTB	OFLOF		;CHECK FOR ERROR CNT OVERFLOW
80	011126	001405			BEQ	ENO1		;IT DID'T, PRINT COUNT
81	011130				PNTM	OVFLM		;IT DID, PRINT "**OVERFLOW**"
	011130	012700	024702		MOV	#OVFLM, R0		;PRINT MESSAGE
	011134	004767	007416		JSR	PC, TYP0UT		;POINTED TO BY OVFLM
82	011140	000404			BR	ENRET		
83	011142	016700	021270	ENO1:	MOV	ERRCNT, R0		;GET ERROR COUNT
84	011146	004767	010540		JSR	PC, DECPNT		;PRINT IT IN DECIMAL
85	011152	000207		ENRET:	RTS	PC		

CZCMJCO CMR(V) 11 HOST EXERCISE MACRO V04.00 02:24:05 PAGE 17
 PORT LOOP BACK TEST

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1          .SBTTL PORT LOOP-BACK TEST
2
3
4          ;ASK FOR PORT # TO BE TESTED (<CR> = ALL PORTS)
5
6
7 011154 012767 000000 021246 PORTLP: MOV      #0,CNTR          ;BETTER CHECK FOR PWR-UP COMPL
8 011162 027727 021244 102000 PRLC:  CMP      @CSR,@102000    ;POWER UP COMPLETE?
9 011170 001420                BEQ      POK              ;YES, CARRY ON
10 011172 005367 021232        DEC      CNTR             ;NO, WAIT A BIT
11 011176 001371                BNE      PRLC
12 011200                ERROR   \N,NOGO          ;ERROR:HOST MICRO FAILED TO START
                                           ;***** ERROR 42 *****

    011200 032777 040000 021272        BIT      @B14,@SR
    011206 001007                BNE      .+20
    011210 012700 026477                MOV      @NOGO,R0
    011214 012767 000042 006652        MOV      #42,ERRNUM
    011222 004767 006500                JSR      PC,ERR
                                           =
                                           N+1

13 011226                HLT                      ;RUN LOGIC TEST.
    011226 004767 006222                JSR      PC,SWHLT
14 011232 012767 000010 021200 POK:  MOV      #10,ITER          ;LOAD ITERATION COUNT
15 011240 005067 021154                CLR      ALLFLG          ;CLEAR "ALL" FLAG
16 011244 005067 021176                CLR      PASCNT          ;CLEAR PASS COUNT
17 011250 005067 021162                CLR      ERRCNT          ;CLEAR ERROR COUNT
18 011254 105067 021125                CLR      OFLOF          ;CLR OVERFLOW FLAG
19 011260                PNTM     PLTM              ;PRINT "PORT LOOP-BACK TEST"
    011260 012700 024717                MOV      @PLTM,R0        ;PRINT MESSAGE
    011264 004767 007256                JSR      PC,TYPOUT        ;POINTED TO BY PLTM
20 011270                PNTM     RECON             ;PRINT RECONNECT COMMUNICATIONS ;D.W 001
    011270 012700 024412                MOV      @RECON,R0       ;PRINT MESSAGE
    011274 004767 007256                JSR      PC,TYPOUT        ;POINTED TO BY RECON
21 011300                PSTO:  PNTM     PORTN            ;PRINT "PORT # (<CR>=ALL) "
    011300 012700 024745                MOV      @PORTN,R0       ;PRINT MESSAGE
    011304 004767 007246                JSR      PC,TYPOUT        ;POINTED TO BY PORTN
22 011310 012767 000004 010212        MOV      #4,KBBUF        ;DEFAULT IS "ALL"
23 011316 012767 011300 021126        MOV      @PSTO,PCONT      ;LOAD RETURN ADDRESS
24 011324 004767 007270                JSR      PC,INPKB        ;GET KBD INPUT
25 011330 005067 021116                CLR      PCONT
26 011334 026727 010170 000004        CMP      KBBUF,#4        ;WAS IT DEFAULT (OR 4)?
27 011342 001007                BNE      PST1            ;NO
28 011344 012767 177777 021046        MOV      #-1,ALLFLG      ;YES, SET "ALL" FLAG
29 011352 005067 021100                CLR      PORT            ; START WITH PORT 0
30 011356 000167 000034                JMP      PST2A

31
32 011362 101004                PST1:  BHI      PSTE          ;WAS IT HIGHER THAN 4?
33 011364 005067 021030                CLR      ALLFLG          ;NO, MUST BE A PORT #
34 011370 000167 000014                JMP      PST2
35 011374                PSTE:  PNTM     AGAIN            ;WRONG!, TRY AGAIN
    011374 012700 022624                MOV      @AGAIN,R0       ;PRINT MESSAGE
    011400 004767 007152                JSR      PC,TYPOUT        ;POINTED TO BY AGAIN
36 011404 000167 177670                JMP      PSTO
37 011410 016767 010114 021040        PST2:  MOV      KBBUF,PORT    ;SAVE PORT #
38 011416 012777 000020 021006        PST2A: MOV      #20,@CSR     ;CLR TOP BYTE
39 011424 005077 021044                CLR      @SPAR           ;ADDRESS REQ. SCR. PAD
40 011430 012777 000212 021040        MOV      #212,@SPDR      ;LOAD MAINT FUNC.
41 011436 005277 021032                INC      @SPAR           ;TO DO PORT LOOP-BACK
    
```

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 17 1
 PORT LOOP-BACK TEST

```

42 011442 012777 000023 021026      MOV      #23,@SPDR      ;DATA LEN. = 23
43 011450 005277 021020      INC      @SPAR
44 011454 012777 000001 021014      MOV      #1,@SPDR      ;ONE REQUEST
45 011462 005277 021006      INC      @SPAR
46 011466 016777 020764 021002      MOV      PORT,@SPDR    ;LOAD PORT # (XMTR)
47 011474 005277 020774      INC      @SPAR
48 011500 016777 020752 020770      MOV      PORT,@SPDR    ;LOAD PORT # (RCVR)
49 011506 012767 000020 020714      MOV      #20,CNTR      ;CHARACTER COUNTER
50 011514 012701 031266      MOV      @DATBL,R1     ;LOOP DATA FROM "DATBL"
51 011520 005277 020750      PST3:   INC      @SPAR
52 011524 012177 020746      MOV      (R1)+,@SPDR   ;LOAD DATA BYTE
53 011530 005367 020674      DEC      CNTR          ;LOADED ALL?
54 011534 001371      BNE     PST3          ;NO, KEEP LOADING
55 011536      PST5:   PNTM     TYPGR   ;PRINT "TYPE <CR> WHEN READ"
      011536 012700 024777      MOV      @TYPGR,RO     ;PRINT MESSAGE
      011542 004767 007010      JSR     PC,TYPGR      ;POINTED TO BY TYPGR
56 011546 012767 011536 020676 PST4:   MOV      @PST5,PCONT   ;INDICATE PROMPT PENDING
57 011554 012767 001236 007746      MOV      #1236,KBBUF  ;LOAD ANY DEFAULT VALUE
58 011562 004767 007032      JSR     PC,INPKB      ;GET KEYBOARD INPUT
59 011566 005067 020660      CLR     PCONT
60 011572 026727 007732 001236      CMP     KBBUF,#1236
61 011600 001356      BNE     PST5
62
63      ;START MAINTENANCE FUNCTION
64
65 011602      PST5:   MTPS     #P0    ;ALLOW LINE CLOCK INTERRUPTS
      011602 012746 000000      MOV     #P0,-(SP)
      011606 012746 011614      MOV     #64,-(SP)
      011612 000002      RTI
      011614
66 011614 012777 000020 020610 64:   MOV     #20,BCSR      ;CLR TOP BYTE
67 011622 012777 000200 020602      MOV     #200,BCSR     ;SET "MAIN"
68 011630 005777 020576      PST6:   TST     BCSR     ;LOOK FOR INTERRUPT BIT
69 011634 100403      BHI     PST60
70 011636 004767 006310      JSR     PC,MONIT      ;AND WATCH FOR CNTRL CHARS.
71 011642 000772      BR     PST6
72 011644 012777 001002 020622 PST60: MOV     #1002,@SPAR   ;NOW CHECK USOF
73 011652 027727 020620 000001      CMP     @SPDR,#1     ;DONE SUCCESSFULLY?
74 011660 001004      BNE     PST7         ;NO, CHECK ERROR TYPE
75 011662 004767 006264      JSR     PC,MONIT
76 011666 000167 000430      JMP     ENDCHK
77 011672 027727 020600 000375 PST7:   CMP     @SPDR,#375
78 011700 103434      BLO     PST8
79 011702      ERROR  \N,PLFFE     ;ERROR:TOTAL FAILURE OF "MAIN" FUNCTION
      011702 032777 040000 020570      BIT     #814,@SR     ;***** ERROR 43 *****
      011710 001007      BNE     .+20
      011712 012700 030430      MOV     @PLFFE,RO
      011716 012767 000043 006150      MOV     #43,ERRNUM
      011724 004767 005776      JSR     PC,ERR
      000044      =     N+1
80 011730 032777 040000 020542 N     BIT     #814,@SR     ;PRINT ALLOWED?
81 011736 001010      BNE     PST7S
82 011740      PNTM     PORTMS     ;PRINT "PORT # "
      011740 012700 025245      MOV     @PORTMS,RO   ;PRINT MESSAGE
      011744 004767 006606      JSR     PC,TYPGR     ;POINTED TO BY PORTMS
83 011750 016700 020502      MOV     PORT,RO

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 17-2
 PORT LOOP-BACK TEST

84	011754	004767	007626			JSR	PC,OCTPNT		
85	011760				PST7S:	SCOPE	PST5		
	011760	004567	005510			JSR	R5,SCPRTN		
	011764	011602				PST5			
86	011766	000167	000330			JMP	ENDCHK		
87	011772	027727	020500	000374	PST8:	CMP	BSPDR,#374		;XMTR HUNG UP?
88	012000	103434				BLO	PST8O		
89	012002					ERROR	\N,PLTXTO		;ERROR:XMTR TIMEOUT ERROR
									;***** ERROR 44 *****
	012002	032777	040000	020470		BIT	#B14,BSR		
	012010	001007				BNE	.+20		
	012012	012700	030473			MOV	#PLTXTO,RO		
	012016	012767	000644	006050		MOV	#44,ERRNUM		
	012024	004767	005676			JSR	PC,ERR		
		000045			N	=	N+1		
90	012030	032777	040000	020442		BIT	#B14,BSR		;PRINT ALLOWED?
91	012036	001010				BNE	PST8S		;NO, SKIP IT
92	012040					PNTM	PORTMS		;PRINT "PORT # "
	012040	012700	025245			MOV	#PORTMS,RO		;PRINT MESSAGE
	012044	004767	006506			JSR	PC,TYPOUT		;POINTED TO BY PORTMS
93	012050	016700	020402			MOV	PORT,RO		
94	012054	004767	007526			JSR	PC,OCTPNT		
95	012060				PST8S:	SCOPE	PST5		
	012060	004567	005410			JSR	R5,SCPRTN		
	012064	011602				PST5			
96	012066	000167	000230			JMP	ENDCHK		
97	012072	027727	020400	000373	PST8O:	CMP	BSPDR,#373		;RCVR HUNG UP?
98	012100	103434				BLO	PST9		
99	012102					ERROR	\N,PLRCTO		;ERROR:RCVR TIMEOUT ERROR
									;***** ERROR 45 *****
	012102	032777	040000	020370		BIT	#B14,BSR		
	012110	001007				BNE	.+20		
	012112	012700	030521			MOV	#PLRCTO,RO		
	012116	012767	000045	005750		MOV	#45,ERRNUM		
	012124	004767	005576			JSR	PC,ERR		
		000046			N	=	N+1		
100	012130	032777	040000	020342		BIT	#B14,BSR		;PRINT ALLOWED?
101	012136	001010				BNE	PST8OS		;NO, SKIP IT
102	012140					PNTM	PORTMS		;PRINT "PORT # "
	012140	012700	025245			MOV	#PORTMS,RO		;PRINT MESSAGE
	012144	004767	006406			JSR	PC,TYPOUT		;POINTED TO BY PORTMS
103	012150	016700	020302			MOV	PORT,RO		
104	012154	004767	007426			JSR	PC,OCTPNT		
105	012160				PST8OS:	SCOPE	PST5		
	012160	004567	005310			JSR	R5,SCPRTN		
	012164	011602				PST5			
106	012166	000167	000130			JMP	ENDCHK		
107	012172	012777	001001	020274	PST9:	MOV	#1001,BSPAR		;ADDRESS DATA TO FIND BAD WORD
108	012200	067777	020272	020266		ADD	BSPDR,BSPAR		
109	012206	017767	020264	005664		MOV	BSPDR,BAD		;GET BAD WORD
110	012214	042777	001000	020252		BIC	#B09,BSPAR		
111	012222	062777	000002	020244		ADD	#2,BSPAR		
112	012230	017767	020242	005640		MOV	BSPDR,GOOD		;GET GOOD WORD
113	012236					DATERR	\N,PLDERR		;ERROR:LOOP TEST DETECTED DATA ERROR
									;***** ERROR 46 *****
	012236	032777	040000	020234		BIT	#B14,BSR		
	012244	001007				BNE	.+20		

CZCMJCO CMR(V) 11 MOST EXERCISE MACRU V04.00 02:24:05 PAGE 17-3
 PORT LOOP-BACK TEST

012246	012700	030547			MOV	@PLDERR,RO	
012252	012767	000046	005614		MOV	@46,ERRNUM	
012260	004767	005526			JSR	PC,DERR	
	000047			N	=	N+1	
114	012264	032777	040000	020206	BIT	@B14,@SR	;PRINT ALLOWED?
115	012272	001010			BNE	PST9S	
116	012274				PNTM	PORTMS	;PRINT "PORT # "
	012274	012700	025245		MOV	@PORTMS,RO	;PRINT MESSAGE
	012300	004767	006252		JSR	PC,TYPOUT	;POINTED TO BY PORTMS
117	012304	016700	020146		MOV	PORT,RO	
118	012310	004767	007272		JSR	PC,OCTPNT	;PRINT #
119	012314			PST9S:	SCOPE	PST5	
	012314	004567	005154		JSR	RS,SCRPTN	
	012320	011602			PST5		
120							
121							
122	012322	052777	000020	020102	ENDCHK:	BIS @B04,@CSR	;CLR TOP BYTE
123	012330	005767	020064		TST	ALLFLG	;DOING ALL PORTS?
124	012334	001441			BEQ	PNTEND	;NO, DONE A PASS
125	012336	026727	020114	000003	CMP	PORT,#3	;YES, DONE ALL?
126	012344	103416			BLO	ENDO	;NO, KEEP GOING
127	012346	005067	020104		CLR	PORT	;CLEAR PORT #
128	012352	012777	000003	020114	MOV	#3,@SPAR	; IN REQ. SCPD
129	012360	016777	020072	020110	MOV	PORT,@SPDR	
130	012366	005277	020102		INC	@SPAR	
131	012372	016777	020060	020076	MOV	PORT,@SPDR	
132	012400	000417			BR	PNTEND	
133	012402	005267	020050		ENDO:	INC PORT	;NEXT PORT
134	012406	012777	000003	020060	MOV	#3,@SPAR	;PREPARE TO LOAD NEXT PORT #
135	012414	016777	020036	020054	MOV	PORT,@SPDR	
136	012422	005277	020046		INC	@SPAR	
137	012426	016777	020024	020042	MOV	PORT,@SPDR	
138	012434	000167	177142		JMP	PST5	
139							
140	012440	005367	017774		PNTEND:	DEC ITER	;UPDATE ITERATION COUNT
141	012444	001404			BEQ	PNT0	
142	012446	032777	004000	020024	BIT	@B11,@SR	;SW 11 =, INH ITERATION
143	012454	001422			BEQ	PNTRTN	
144	012456	012767	000010	017754	PNT0:	MOV #10,ITER	;RELOAD ITERATION COUNT
145	012464	005267	017756		PNT1:	INC PASCNT	;UPDATE PASS COUNT
146	012470	032777	002000	020002	BIT	@B10,@SR	;SW 10 = INH END PASS PRINT
147	012476	001011			BNE	PNTRTN	
148	012500	004767	176366		JSR	PC,ENPRTN	;PRINT END PASS
149	012504	105767	017662		TSTB	CLKFL1	;IS CLOCK TICKING?
150	012510	001402			BEQ	14	;NO, SKIP PRINTOUT
151	012512	004767	005736		JSR	PC,PRNTIM	;PRINT ELAPSED TIME
152	012516	004767	007246		14:	JSR PC,NULLS	;PRINT NULLS
153	012522	004767	005424		PNTRTN:	JSR PC,MONIT	
154	012526	000167	177050		JMP	PST5	

.SBTTL MOST-REMOTE EXERCISE

```

1
2
3
4      ; THIS ROUTINE ASKS FOR EITHER "DETAILED" OR "GENERAL" RUN      ;D.W 001
5      ;
6      ; "DETAILED"                                                    ;D.W 001
7      ;
8      ; THE "DETAILED" RUN CONSISTS OF DOING A BACKGROUND SCAN      ;D.W 001
9      ; IN 'MODE' 0 WHERE EVERY POSSIBLE REMOTE NUMBER IS POLLED    ;D.W 001
10     ; FOR THE PRESENCE OF A REMOTE WHEN "THRU" IS SET, THE        ;D.W 001
11     ; DIAGNOSTIC FUNCTION IS RUN ON ALL CONNECTED REMOTES.        ;D.W 001
12     ;
13     ;
14     ; "GENERAL"                                                    ;D.W 001
15     ;
16     ; THE "GENERAL" RUN ASKS THE USER TO INPUT REMOTE NUMBERS    ;D.W 001
17     ; WHICH HE FEELS ARE ON THE CHR; THEN A BACKGROUND SCAN      ;D.W 001
18     ; IS PERFORMED ON ONLY THOSE REMOTE NUMBERS (USING MODE 1)    ;D.W 001
19     ;
20     ; NOTE: THE "GENERAL" RUN SHOULD BE USED IN MOST CASES      ;D.W 001
21     ; SINCE IT TAKES FAR LESS TIME TO GET THROUGH A PASS.        ;D.W 001
22     ;
23     ; BOTH RUNS DO THE FOLLOWING:                                    ;D.W 001
24     ;
25     ; -START BACKGROUND SCAN, WAIT FOR "THRU"
26     ; -REPORT ALARMS WHILE WAITING.
27     ; -WHEN "THRU" SETS, DO A "PORT CONFIGURATION STATUS" REPORT
28     ; AND THEN
29     ;   RUN "DIAGNOSTIC" FUNCTION ON ALL AVAILABLE REMOTES (DETAILED) ;D.W 001
30     ;   OR DO A "FORCE INTERROGATE" ON ALL AVAILABLE REMOTES (GENERAL) ;D.W 001
31     ; -REPORT ALL CHANGES OF REMOTE STATUS
32     ;
33     ;
34     012532 105067 017641      CMREXC: CLRFB      FAST      ;CLEAR "FAST" FLAG      ;D.W 001
35     012536 005067 017744      CLR      TALLY     ;SORRY, NOT RESTARTABLE ;D.W 001
36     012542      MTPS      #0      ;INTERRUPT ON
37     012542 012746 000000      MOV      #0, -(SP)
38     012546 012746 012554      MOV      #64, -(SP)
39     012552 000002      RTI
40     012554      64:
41     012554 005067 017666      CLR      PASCNT    ;CLEAR PASS COUNTER
42     012560 012767 000010 017652  MOV      #10, ITER ;LOAD ITERATION COUNT
43     012566 105067 017613      CLRFB   OFLOF     ;CLR FLAGS & COUNTERS
44     012572 005067 017640      CLR      ERRCNT
45     012576 012767 000000 017624  MOV      #0, CNTR  ;SET UP TO TIME POWER UP
46     012604 027727 017622 102000 CELP:  CMP      BCSR, #102000 ;PWR-UP & INTR SET?
47     012612 001420      BEQ      EXSOO    ;YES, CONTINUE
48     012614 005367 017610      DEC      CNTR    ;NO, WAIT A BIT
49     012620 001371      BNE      CELP
50     012622      ERROR    \N, NOGO ;ERROR: MOST MICRO WON'T START
51     ;***** ERROR 47 *****
52     012622 032777 040000 017650      BIT      #B14, BSR
53     012630 001007      BNE      .+20
54     012632 012700 026477      MOV      #NOGO, R0
55     012636 012767 000047 005230      MOV      #47, ERNUM
56     012644 004767 005056      JSR      PC, ERR
57     000050      N      .      N+1

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C5

47	012650				HLT			;RUN LOGIC TEST
	012650	004767	004600		JSR	PC,SMLT		
48	012654				EXS00:	PNTM	EXCM	;PRINT "CMR EXERCISE ROUTINE" ;D.W 001
	012654	012700	025027		MOV	@EXCM,RO		;PRINT MESSAGE
	012660	004767	005672		JSR	PC,TYPOUT		;POINTED TO BY EXCM
49	012664				PNTM	RECON		;PRINT "RECONNECT COMMUNICATIONS";D.W 001
	012664	012700	024412		MOV	@RECON,RO		;PRINT MESSAGE
	012670	004767	005662		JSR	PC,TYPOUT		;POINTED TO BY RECON
50	012674				EXS0A:	PNTM	DTLGN	;ASK "DETAILED" OR "GENERAL" ;D.W 001
	012674	012700	025537		MOV	@DTLGN,RO		;PRINT MESSAGE
	012700	004767	005652		JSR	PC,TYPOUT		;POINTED TO BY DTLGN
51	012704	012767	000000	006616	MOV	@0,KBBUF		;DEFAULT "GENERAL" ;D.W 001
52	012712	012767	012674	017532	MOV	@EXS0A,PCONT		;SET RE-ASK POINTER ;D.W 001
53	012720	004767	005674		JSR	PC,INPKB		;GO GET AN INPUT ;D.W 001
54	012724	005067	017522		CLR	PCONT		;D.W 001
55	012730	026727	006574	000000	CMP	KBBUF,@0		;WANT DEFAULT OR 0? ;D.W 001
56	012736	001416			BEQ	EXS0B		;YES, GENERAL. GET REM #'S ;D.W 001
57	012740	026727	006564	000001	CMP	KBBUF,@1		;WANT DETAILED? ;D.W 001
58	012746	001406			BEQ	EXS0NA		;YES, DO DETAILED RUN ;D.W 001
59	012750				PNTM	AGAIN		;OTHERWISE, YOU'RE CONFUSED! ;D.W 001
	012750	012700	022624		MOV	@AGAIN,RO		;PRINT MESSAGE
	012754	004767	005576		JSR	PC,TYPOUT		;POINTED TO BY AGAIN
60	012760	000167	177710		JMP	EXS0A		;TRY AGAIN. ;D.W 001
61								
62	012764	105067	017407		EXS0NA:	CLRB	FAST	;NOT GOING THE FAST ROUTE ;D.W 001
63	012770	000167	000220		JMP	EXS01		;GO AHEAD WITH DETAILED. ;D.W 001
64								
65	012774	012702	031326		EXS0B:	MOV	@EXTBL1,R2	;BORROW PORT 1 TABLE FOR NOW ;D.W 001
66	013000	005722			TST	(R2)+		;SKIP OVER ENTRY COUNTER ;D.W 001
67	013002				PNTM	GTREM		;PRINT "TYPE PORT/REMOTE NUMBERS";D.W 001
	013002	012700	025602		MOV	@GTREM,RO		;PRINT MESSAGE
	013006	004767	005544		JSR	PC,TYPOUT		;POINTED TO BY GTREM
68	013012	016700	017470		EXS0C:	MOV	TALLY,RO	;PRINT ITEM # ;D.W 001
69	013016	005200			INC	RO		;OFFSET (START AT 1, NOT 0) ;D.W 001
70	013020	004767	006714		JSR	PC,DECJSP		;PRINT DECIMAL ENTRY # ;D.W 001
71	013024				PNTM	RMINB		;PRINT " REM#" ;D.W 001
	013024	012700	025657		MOV	@RMINB,RO		;PRINT MESSAGE
	013030	004767	005522		JSR	PC,TYPOUT		;POINTED TO BY RMINB
72	013034				PNTM	TWOSP		;PROMPT FOR INPUT ;D.W 001
	013034	012700	023071		MOV	@TWOSP,RO		;PRINT MESSAGE
	013040	004767	005512		JSR	PC,TYPOUT		;POINTED TO BY TWOSP
73	013044	012767	000077	006456	MOV	@77,KBBUF		;DEFAULT 'END OF INPUT' ;D.W 001
74	013052	012767	013012	017372	MOV	@EXS0C,PCONT		;SET RE-ASK POINTER ;D.W 001
75	013060	004767	005534		JSR	PC,INPKB		;GET KEYBOARD INPUT ;D.W 001
76	013064	005067	017362		CLR	PCONT		;D.W 001
77	013070	016700	006434		MOV	KBBUF,RO		;LET'S LOOK AT WHAT WE'VE GOT ;D.W 001
78	013074	042700	177700		BIC	@177700,RO		;CHECK FOR EXIT NUMBER ;D.W 001
79	013100	020027	000077		CMP	RO,@77		;GET IT? ;D.W 001
80	013104	001414			BEQ	EXS0D		;IF YES, CHECK TALLY & LEAVE ;D.W 001
81	013106	026727	006416	000400	CMP	KBBUF,@400		;WANT HELP? ;D.W 001
82	013114	103415			BLO	STRM		;NO, MUST BE O.K. ;D.W 001
83	013116				PNTM	GRHLP		;O.K. GIVE HIM HELP ;D.W 001
	013116	012700	025670		MOV	@GRHLP,RO		;PRINT MESSAGE
	013122	004767	005430		JSR	PC,TYPOUT		;POINTED TO BY GRHLP
84	013126	005767	017354		TST	TALLY		;HAS HE ENTERED ANY YET? ;D.W 001
85	013132	001327			BNE	EXS0C		;YES, GET NEXT REMOTE # ;D.W 001
86	013134	000717			BR	EXS0B		;NO, ASK FOR REMOTES ;D.W 001

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87
88 013136 005767 017344      EXS0D:  TST      TALLY      ;GET ANY REMOTE #'S?      ;D.W 001
89 013142 001014              BNE      EXSGO      ;YES, GO WITH THEM      ;D.W 001
90 013144 000167 177624      JMP      EXSOB      ;NO, GO GET SOME      ;D.W 001
91
92
93 013150 016722 006354      STRMN:  MOV      KBBUF,(R2). ;PUT REMOTE # INTO TABLE ;D.W 001
94 013154 005267 017326      INC      TALLY      ;COUNT IT.      ;D.W 001
95 013160 026727 017322 000037  CMP      TALLY,#37 ;GOT ENOUGH?      ;D.W 001
96 013166 001402              BEQ      EXSGO      ;YES, GO WITH THEM      ;D.W 001
97 013170 000167 177616      JMP      EXSOC      ;NO, GO GET MORE.      ;D.W 001
98
99      ;WE HAVE ARRIVED HERE BECAUSE THE USER WANTS A FAST RUN USING ONLY THE ;D.W 001
100     ;REMOTE NUMBERS ENTERED AT STARTUP. MUST SET UP A QUEUE FOR BACKGROUND ;D.W 001
101     ;SCAN AND SET A SOFTWARE FLAG "FAST".      ;D.W 001
102
103 013174 016767 017306 016124  EXSGO:  MOV      TALLY,EXTBL1 ;SAVE REMOTE COUNT      ;D.W 001
104 013202 004767 000764      JSR      PC,LDQUE ;SET MODE - 1 AND LOAD QUEUE ;D.W 001
105 013206 112767 177777 017163  MOVVB   #-1,FAST ;SET SOFTWARE FLAG      ;D.W 001
106      ;START EXERCISING      ;D.W 001
107
108 013214 005067 017204      EXS01:  CLR      CHNGFL ;CLEAR STATUS CHANGE FLAG
109 013220 005077 017206      CLR      BCSR      ;START OFF CLEAR
110 013224 012777 000020 017200  MOV     #20,BCSR ;CLEAR TOP BYTE
111 013232 012777 000044 017172  MOV     #44,BCSR ;ENABLE BKG SCAN & THRU INTR
112 013240 105767 017133      TSTB    FAST ;DOING THE FAST RUN? ;D.W 001
113 013244 001004              BNE      EXS01A ;YES, SKIP THE WARNING PRINTOUT ;D.W 001
114 013246              PNTM    SLOW ;HOLD OFF A MINUTE!! ;D.W 001
      013246 012700 025056      MOV     #SLOW,RO ;PRINT MESSAGE
      013252 004767 005300      JSR      PC,TYP0UT ;POINTED TO BY SLOW
115 013256 105067 017124      EXS01A: CLR      ONCE
116 013262 105067 017125      CLR      THRU ;CLEAR TABLES
117 013266 005067 017214      CLR      TALLY
118 013272 005067 016030      CLR      EXTBL1
119 013276 005067 016224      CLR      EXTBL2
120 013302 005067 016420      CLR      EXTBL3
121 013306 005067 016614      CLR      EXTBL4
122
123     ;EXERCISER MAIN LOOP
124
125 013312 004767 001450      EXS2:   JSR      PC,SCALM ;GO SCAN ALARMS
126 013316 004767 004630      JSR      PC,MONIT ;CHECK FOR CNTRL CHARS.
127 013322 032777 040000 017102  BIT     #B14,BCSR ;IS FUN COMPL SET?
128 013330 001410              BEQ     EXS2B ;NO.
129 013332 052777 000020 017072  BIS     #20,BCSR ;CLR TOP BYTE
130 013340 005767 017060      TST     CHNGFL ;CHANGE FLAG SET?
131 013344 001022              BNE     EXS3 ;IF YES, DO PCS
132 013346 004767 004600      JSR      PC,MONIT ;CHECK FOR CNTRL CHARS
133 013352 105767 017035      EXS2B: TSTB    THRU ;IS "THRU" SET?
134 013356 001015              BNE     EXS3 ;IF YES, DO PORT CONFIG
135 013360 105767 017022      TSTB    ONCE ;DONE PORT CONFIG ONCE?
136 013364 001752              BEQ     EXS2 ;NO, WAIT FOR THRU
137 013366 005767 017114      TST     TALLY ;YES, ANY REMOTES?
138 013372 001747              BEQ     EXS2 ;NO, WAIT FOR CHANGE OR THRU
139 013374 005767 017024      TST     CHNGFL ;YES, ANY CHANGES PENDING?
140 013400 001004              BNE     EXS3 ;YES, NEW PORT CONFIG
141 013402 004767 000322      EXS2C: JSR      PC,DIAGFU ;NO, GO DO DIAG FUNC ON AVAIL REMOTES

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CZCMJCG CMR(V)-11 HOST EXERCISE MACRO V04.00 02:24:05 PAGE 18-3
 HOST-REMOTE EXERCISE

142	013406	000167	000104		JMP	SKPD2		; THEN PRINT END PASS STUFF
143	013412	004767	000172		EXS3: JSR	PC,PRTCNF		; DO A PORT CONFIG FUNC.
144	013416	005067	017002		CLR	CHNGFL		; CLR CHANGE FLAG
145	013422	112777	000074	017002	MOVB	#74,BCSR		; ENAB BKG SCN,CHGST,THRU INTR
146	013430	005767	017052		TST	TALLY		; ANY REMOTES?
147	013434	001411			BEQ	EXS3A		; NO, IDLE
148	013436	105767	016744		TSTB	ONCE		; ALREADY DONE REPORT?
149	013442	001017			BNE	EXS3B		; YES, SKIP IT THIS TIME
150	013444	004767	002210		JSR	PC,REPORT		; REPORT ALL REGULAR REMOTES
151	013450	112767	177777	016717	MOVB	#-1,CNFGFL		; SET PORT CONFIG AVAILABLE FLAG
152	013456	000411			BR	EXS3B		
153	013460	105067	016722		EXS3A: CLRB	ONCE		; NO REMOTES, WAIT FOR THRU
154	013464				PNTM	NOREM		; PRINT "NO REMOTES..WAITING"
	013464	012700	025137		MOV	#NOREM,RO		; PRINT MESSAGE
	013470	004767	005062		JSR	PC,TYPOUT		; POINTED TO BY NOREM
155	013474	105067	016713		CLRB	THRU		; CLEAR THRU FLAG
156	013500	000704			BR	EXS2		
157	013502	105067	016705		EXS3B: CLRB	THRU		; CLEAR THRU FLAG
158	013506	112767	177777	016672	MOVB	#-1,ONCE		; SET "ONCE" FLAG
159	013514	000676			BR	EXS2		
160								
161	013516	005367	016716		SKPD2: DEC	ITER		; UPDATE ITERATION COUNT
162	013522	001404			BEQ	SKPX0		; IF 0, END PASS.
163	013524	032777	004000	016746	BIT	#B11,BSR		; SW 11 = 1 == INH ITER.
164	013532	001422			BEQ	SKPX1		
165	013534	012767	000010	016676	SKPX0: MOV	#10,ITER		; RELOAD ITERATION COUNT
166	013542	005267	016700		INC	PASCNT		; UPDATE PASS COUNT
167	013546	032777	002000	016724	CIT	#B10,BSR		; SW 10 = INH END PASS PRINT
168	013554	001011			BNE	SKPX1		
169	013556	004767	175310		JSR	PC,ENPRTN		; PRINT END PASS STUFF
170	013562	105767	016604		TSTB	CLKFL1		; IS CLOCK TICKING?
171	013566	001402			BEQ	14		; NO, SKIP PRINTOUT
172	013570	004767	004660		JSR	PC,PRNTIM		; PRINT ELAPSED TIME
173	013574	004767	006170		14:	JSR	PC,NULLS	
174	013600	004767	004346		SKPX1: JSR	PC,MONIT		
175	013604	000167	177502		JMP	EXS2		; KEEP GOING

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 19
 MOST REMOTE EXERCISE

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1
2
3
4
5 013610 005067 016610      PRTCNF: CLR      CHNGFL      ;CLEAR "CHANGE FLAG"
6 013614 005067 016666      CLR      TALLY      ;CLEAR REMOTE TALLY
7 013620 012767 031326 016662  MOV      @EXTBL1,TBLAD ;SET UP TO CONFIG PORT 0
8 013626 012767 000000 016620  MOV      @0,POR#1
9 013634 004767 001516      JSR      PC,PORCNF    ;DO PORT CONFIG ON PORT 0
10 013640 012767 031526 016642  MOV      @EXTBL2,TBLAD
11 013646 012767 000001 016600  MOV      @1,PORN
12 013654 004767 001476      JSR      PC,PORCNF    ;DO PORT CONFIG ON PORT 1
13 013660 012767 031726 016622  MOV      @EXTBL3,TBLAD
14 013666 012767 000002 016560  MOV      @2,PORN
15 013674 004767 001456      JSR      PC,PORCNF    ;DO PORT CONFIG ON PORT 2
16 013700 012767 032126 016602  MOV      @EXTBL4,TBLAD
17 013706 012767 000003 016540  MOV      @3,PORN
18 013714 004767 001436      JSR      PC,PORCNF    ;DO PORT CONFIG ON PORT 3
19 013720 005767 016500      TST      CHNGFL      ;ANY CHANGES PENDING?
20 013724 001331      BNE      PRTCNF      ;IF SO, DO IT ALL OVER
21 013726 000207      RTS      PC

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 20
 MOST-REMOTE EXERCISE

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1      ;SUBROUTINE TO DO THE DIAGNOSTIC FUNCTION OR FORCE INTERROGATE      ;D.W 001
2      ;ON ALL REMOTES WHICH ARE ON LINE AND REGULAR                      ;D.W 001
3
4 013730 012701 031326  DIAGFU: MOV      #EXTBL1,R1      ;GET TABLE FOR PORT 0
5 013734 012167 016470      MOV      (R1)+,CNTR      ;GET # OF REMOTES ON PORT
6 013740 001002      BNE      SKP1      ;NONE, NEXT PORT
7 013742 000167 000032      JMP      SKP2
8 013746 012167 016512  SKP1:  MOV      (R1)+,REMNO      ;GET 1ST REMOTE #
9 013752 105767 016421      TSTB     FAST      ;'FAST' FLAG SET?      ;D.W 001
10 013756 001403      BEQ      SKP1A      ;NO, DIAGNOSTIC FUNCTION      ;D.W 001
11 013760 004767 000346      JSR      PC,IFORCE      ;YES, FORCE INTERROGATE      ;D.W 001
12 013764 000402      BR       SKP1B      ;D.W 001
13 013766 004767 002256  SKP1A: JSR      PC,DIAGNF      ;DO DIAGNOSTIC FUNC. ON REM.
14 013772 005367 016432  SKP1B: DEC      CNTR      ;DO ALL REMOTES ON THIS PORT
15 013776 001363      BNE      SKP1
16
17 014000 012701 031526  SKP2:  MOV      #EXTBL2,R1      ;GET TABLE FOR PORT 1
18 014004 012167 016420      MOV      (R1)+,CNTR      ;1ST ENTRY IS # OF REMOTES
19 014010 001002      BNE      SKP3
20 014012 000167 000032      JMP      SKP4
21 014016 012167 016442  SKP3:  MOV      (R1)+,REMNO      ;IF NONE, NEXT PORT
22 014022 105767 016351      TSTB     FAST      ;GET REMOTE NO.
23 014026 001403      BEQ      SKP3A      ;'FAST' FLAG SET?      ;D.W 001
24 014030 004767 000276      JSR      PC,IFORCE      ;NO, DIAGNOSTIC FUNCTION      ;D.W 001
25 014034 000402      BR       SKP3B      ;YES, FORCE INTERROGATE      ;D.W 001
26 014036 004767 002206  SKP3A: JSR      PC,DIAGNF      ;DO DIAGNOSTIC FUNCTION ON REM.
27 014042 005367 016362  SKP3B: DEC      CNTR
28 014046 001363      BNE      SKP3
29 014050 012701 031726  SKP4:  MOV      #EXTBL3,R1      ;GET TABLE FOR PORT 2
30 014054 012167 016350      MOV      (R1)+,CNTR      ;1ST ENTRY IS # OF REMOTES
31 014060 001002      BNE      SKP5
32 014062 000167 000032      JMP      SKP6
33 014066 012167 016372  SKP5:  MOV      (R1)+,REMNO      ;IF NONE, NEXT PORT
34 014072 105767 016301      TSTB     FAST      ;GET REMOTE #
35 014076 001403      BEQ      SKP5A      ;'FAST' FLAG SET?      ;D.W 001
36 014100 004767 000226      JSR      PC,IFORCE      ;NO, DIAGNOSTIC FUNCTION      ;D.W 001
37 014104 000402      BR       SKP5B      ;YES, FORCE INTERROGATE      ;D.W 001
38 014106 004767 002136  SKP5A: JSR      PC,DIAGNF      ;DO DIAGNOSTIC FUNC. ON REMOTE
39 014112 005367 016312  SKP5B: DEC      CNTR
40 014116 001363      BNE      SKP5
41 014120 012701 032126  SKP6:  MOV      #EXTBL4,R1      ;GET TABLE FOR PORT 3
42 014124 012167 016300      MOV      (R1)+,CNTR      ;1ST ENTRY IS # OF REMOTES
43 014130 001002      BNE      SKP7
44 014132 000167 000032      JMP      SKP8
45 014136 012167 016322  SKP7:  MOV      (R1)+,REMNO      ;IF NONE, DONE!
46 014142 105767 016231      TSTB     FAST      ;GET REMOTE #
47 014146 001403      BEQ      SKP7A      ;'FAST' FLAG SET?      ;D.W 001
48 014150 004767 000156      JSR      PC,IFORCE      ;NO, DIAGNOSTIC FUNCTION      ;D.W 001
49 014154 000402      BR       SKP7B      ;YES, FORCE INTERROGATE      ;D.W 001
50 014156 004767 002066  SKP7A: JSR      PC,DIAGNF      ;DO DIAGNOSTIC FUNCTION ON REM.
51 014162 005367 016242  SKP7B: DEC      CNTR      ;FINISH ALL REMOTES ON THIS PORT
52 014166 001363      BNE      SKP7
53 014170 000207      RTS      PC
54

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 21
 MOST REMOTE EXERCISE

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1          ;BACKGROUND SCAN QUEUE LOADING ROUTINE.                ;D.W 001
2          ;
3          ;ONLY AVAILABLE IF RUNNING "GENERAL" OR FAST MODE.      ;D.W 001
4          ;PERFORMS THE 'SET MOST PARAMETERS' FUNCTION ON THE MOST ;D.W 001
5          ;AND LOADS THE REMOTE NUMBERS (TEMPORARILY STORED IN EXTBL1) ;D.W 001
6          ;INTO THE SCAN QUEUE AS WELL AS SETTING THE MOST MODE TO '1' ;D.W 001
7          ;
8
9 014172 012701 031326          LDQUE:  MOV    #EXTBL1,R1          ;GET TABLE OF REMOTES          ;D.W 001
10 014176 052777 000020 016226    BIS    #B04,BCSR          ;CLEAR TOP BYTE OF CSR        ;D.W 001
11 014204 005077 016264          CLR    BSPAR              ;POINT TO REQUEST SCRATCHPAD  ;D.W 001
12 014210 012167 016214          MOV    (R1)+,CNTR        ;GET NUMBER OF ENTRIES        ;D.W 001
13 014214 012777 000120 016254    MOV    #120,BSPDR        ;LOAD 'SET MOST' FUNCTION     ;D.W 001
14 014222 016700 016202          MOV    CNTR,RO           ;CREATE "NO. OF BYTES FOLLOWING" ;D.W 001
15 014226 062700 000002          ADD    #2,RO             ;INCLUDES MODE & # OF REQUESTS ;D.W 001
16 014232 005277 016236          INC    BSPAR              ;LOAD # OF BYTES              ;D.W 001
17 014236 010077 016234          MOV    RO,BSPDR          ;LOAD # OF BYTES              ;D.W 001
18 014242 005277 016226          INC    BSPAR              ;D.W 001
19 014246 012777 000001 016222    MOV    #1,BSPDR          ;ONE REQUEST                   ;D.W 001
20 014254 005277 016214          INC    BSPAR              ;D.W 001
21 014260 012777 000001 016210    MOV    #1,BSPDR          ;M O D E 1                    ;D.W 001
22
23 014266 005277 016202          LDQLP: INC    BSPAR        ;LOAD NEXT REMOTE #           ;D.W 001
24 014272 012177 016200          MOV    (R1)+,BSPDR       ;FROM TABLE                  ;D.W 001
25 014276 005367 016126          DEC    CNTR              ;KEEP TRACK                   ;D.W 001
26 014302 001371          BNE    LDQLP              ;D.W 001
27
28 014304 052777 000001 016120          BIS    #B00,BCSR          ;IF DONE, START FUNCTION      ;D.W 001
29 014312 032777 040000 016112    LDQFC: BIT    #B14,BCSR    ;FUNCTION COMPLETE?           ;D.W 001
30 014320 001003          BNE    LDQRT              ;IF YES, EXIT                 ;D.W 001
31 014322 004767 003624          JSR    PC,MONIT          ;ANY CONTROL CHARACTERS?     ;D.W 001
32 014326 000771          BR     LDQFC              ;KEEP AN EYE OPEN            ;D.W 001
33 014330 000207          LDQRT: RTS    PC          ;ALL DONE... EXIT            ;D.W 001

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1      ;SUBROUTINE TO DO A 'FORCE INTERROGATE' FUNCTION ON REMOTE IN REMNO' ;D.W 001
2      ;
3      ;THIS REPLACES THE 'DIAGNOSTIC' FUNCTION IF WE'RE RUNNING IN ;D.W 001
4      ; "GENERAL" OR FAST MODE. ;D.W 001
5      ;
6
7 014332 005077 016136 IFORCE: CLR BSPAR ;ADDRESS REQUEST SCRATCHPAD ;D.W 001
8 014336 012777 000130 016132 MOV #130,BSPDR ;LOAD FORCE INTERROGATE CODE ;D.W 001
9 014344 005277 016124 INC BSPAR
10 014350 012777 000002 016120 MOV #2,BSPDR ;ALWAYS 2 BYTES FOLLOWING ;D.W 001
11 014356 005277 016112 INC BSPAR
12 014362 012777 000001 016106 MOV #1,BSPDR ;ALWAYS 1 REQUEST ;D.W 001
13 014370 005277 016100 INC BSPAR ;D.W 001
14 014374 016777 016064 016074 MOV REMNO,BSPDR ;LOAD REMOTE NUMBER ;D.W 001
15 014402 004767 000360 IFRWTO: JSR PC,SCALM ;CLEAR ALARMS ETC VIA SCAN ;D.W 001
16 014406 052777 000020 016016 BIS #B04,BCSR ;CLR TOP BYTE TO START ;D.W 001
17 014414 052777 000001 016010 BIS #B00,BCSR ;SET START FUNCTION ;D.W 001
18
19 014422 032777 040000 016002 IFRWT: BIT #B14,BCSR ;FUNC COMPL SET? ;D.W 001
20 014430 001003 BNE IFRCN ;IF YES CONTINUE ;D.W 001
21 014432 004767 000330 JSR PC,SCALM ;SCAN FOR ALARMS ;D.W 001
22 014436 000771 BR IFRWT ;AND WAIT FOR FUNC COMPL ;D.W 001
23
24 014440 012777 001000 016026 IFRCN: MOV #1000,BSPAR ;ADDRESS RESULTS SCR-PAD ;D.W 001
25 014446 012767 000130 003422 MOV #130,GOOD ;CHECK FOR CORRECT FUNCT ;D.W 001
26 014454 017767 016016 003416 MOV BSPDR,BAD ;READ RETURNED FUNC CODE ;D.W 001
27 014462 026767 003410 003410 CMP GOOD,BAD ;IS IT CORRECT (130)? ;D.W 001
28 014470 001416 BEQ IFRCN1 ;YES, LOOK AT RESULTS ;D.W 001
29 014472 DATERR \N,FIFUN ;ERROR:FORCE INT FUNC GAVE BAD FUNC CODE ;D.W 001
;***** ERROR 50 *****
014472 032777 040000 016000 BIT #B14,BSR
014500 001007 BNE .+20
014502 012700 030747 MOV #FIFUN,RO
014506 012767 000050 003360 MOV #50,ERRNUM
014514 004767 003272 JSR PC,DERR
000051 = N+1
30 014520 SCOPE IFRWTO ;D.W 001
014520 004567 002750 JSR R5,SCPRTN
014524 014402 IFRWTO
31
32 014526 062777 000002 015740 IFRCN1: ADD #2,BSPAR ;NOW GET STAT ON FUNCTION ;D.W 001
33 014534 012767 000001 003334 MOV #1,GOOD ;SHD SHOW SUCCESS ;D.W 001
34 014542 017767 015730 003330 MOV BSPDR,BAD ;READ USOF ;D.W 001
35 014550 026767 003322 003322 CMP GOOD,BAD ;D.W 001
36 014556 001434 BEQ IFRCN2 ;IF O.K. CONTINUE ;D.W 001
37 014560 DATERR \N,FIFUF ;ERROR:USOF WRONG ON FORCE INTERROGATE ;D.W 001
;***** ERROR 51 *****
014560 032777 040000 015712 BIT #B14,BSR
014566 001007 BNE .+20
014570 012700 031024 MOV #FIFUF,RO
014574 012767 000051 003272 MOV #51,ERRNUM
014602 004767 003204 JSR PC,DERR
000052 = N
38 014606 032777 040000 015664 BIT #B14,BSR ;PRINT ALLOWED? ;D.W 001
39 014614 001012 BNE IFRCN5 ;NO. SKIP IT ;D.W 001
40 014616 012700 025255 PNTM REMSG ;PRINT "REMOTE # " ;D.W 001
014616 MOV #REMSG,RO ;PRINT MESSAGE

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 22 1
MOST-REMOTE EXERCISE

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014622 004767 003730      JSR    PC, TYPOUT      ;POINTED TO BY REMSG
41 014626 005277 015642      INC    @SPAR           ;GET REMØ FROM RES SCR PAD      ;D.W 001
42 014632 017700 015640      MOV    @SPDR, R0      ;D.W 001
43 014636 004767 004744      JSR    PC, OCTPNT     ;PRINT IT                       ;D.W 001
44 014642          IFRCNS: SCOPE  IFRWTO      ;D.W 001
014642 004567 002626      JSR    R5, SCPRTN
014646 014402      IFRWTO
45
46 014650 012777 001004 015616 IFRCN2: MOV    #1004, @SPAR      ;CHECK THE REMOTE STATE      ;D.W 001
47 014656 027727 015614 000003      CMP    @SPDR, #3      ;IS IT UNKNOWN?              ;D.W 001
48 014664 001034          BNE    IFRCN3          ;NO. O.K.                     ;D.W 001
49 014666          ERROR  \N, FICHE      ;ERROR: COMM PROBLEMS DURING FRC INTR ;D.W 001
;***** ERROR 52 *****

014666 032777 040000 015604      BIT    #B14, @SR      ;PRINT ALLOWED?                ;D.W 001
014674 001007          BNE    .+20           ;NO, SKIP IT                   ;D.W 001
014676 012700 031065          MOV    #FICHE, R0     ;PRINT "COMM. STAT = "       ;D.W 001
014702 012767 000052 003164      MOV    #52, ERRNUM
014710 004767 003012      JSR    PC, ERR
000053          N = N+1
50 014714 032777 040000 015556      BIT    #B14, @SR      ;PRINT ALLOWED?                ;D.W 001
51 014722 001012          BNE    IFRC2S        ;NO, SKIP IT                   ;D.W 001
52 014724          PNTM  CONST          ;PRINT "COMM. STAT = "       ;D.W 001
014724 012700 025346          MOV    @CONST, R0     ;PRINT MESSAGE
014730 004767 003622      JSR    PC, TYPOUT     ;POINTED TO BY CONST
53 014734 005277 015534          INC    @SPAR           ;YES. GET COMM STATUS        ;D.W 001
54 014740 017700 015532          MOV    @SPDR, R0     ; FROM RES SCRATCHPAD        ;D.W 001
55 014744 004767 004636          JSR    PC, OCTPNT     ;AND PRINT IT                 ;D.W 001
56 014750          IFRC2S: SCOPE  IFRWTO
014750 004567 002520      JSR    R5, SCPRTN
014754 014402      IFRWTO
57
58 014756 052777 000020 015446 IFRCN3: BIS    #B04, @CSR      ;CLEAR TOP BYTE WHEN DONE      ;D.W 001
59 014764 000207          RTS    PC             ;AND VAMOOSE                   ;D.W 001
60
61

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 23
 MOST-REMOTE EXERCISE

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1          ;SUBROUTINE TO CHECK FOR ALARMS AND CHANGES OF REMOTE STATE.
2          ; IF ALARM... RING 4 BELLS
3          ; IF CHANGE OF REMOTE STATE...SET A FLAG
4
5
6 014766 032777 010000 015436 SCALM: BIT      #B12,BCSR      ;ALARMS?
7 014774 001415                BEQ      SCA1          ;NO, CHECK FOR CHG ST.
8 014776 012700 000007                MOV      #7,R0          ;ALARM! RING TTY BELLS
9 015002 004767 005114                JSR     PC,TTO
10 015006 004767 005110                JSR     PC,TTO
11 015012 004767 005104                JSR     PC,TTO
12 015016 004767 005100                JSR     PC,TTO
13 015022 052777 000020 015402        BIS      #B04,BCSR      ;CLR ALARM
14 015030 000240                SCA1:  NOP
15 015032 000240                NOP
16 015034 000240                NOP
17 015036 032777 020000 015366        BIT      #B13,BCSR      ;CHANGE OF STATE?
18 015044 001531                BEQ      SCA3          ;NO, CHECK THRU
19 015046 012777 001000 015420        MOV      #1000,BSPAR    ;SEE IF THIS IS A SYS ERR
20 015054 027727 015416 000310        CMP      BSPDR,#310    ; OR REMOTE CHANGE
21 015062 001415                BEQ      SCA2          ;REMOTE CHANGE IS O.K.
22 015064                ERROR   \N,SYSER    ;ERROR:HOST SYS ERROR. RUN LOGIC TEST.
                                ;***** ERROR 53 *****

    015064 032777 040000 015406        BIT      #B14,BSR
    015072 001007                BNE     .+20
    015074 012700 030607                MOV      #SYSER,R0
    015100 012767 000053 002766        MOV      #53,ERRNUM
    015106 004767 002614                JSR     PC,ERR
    000054                N          = N+1

23 015112                HLT
    015112 004767 002336                JSR     PC,SWHLT
24 015116                SCA2:  PNTM    REMCHG      ;PRINT "REMOTE STATUS CHANGE"
    015116 012700 025366                MOV      #REMCHG,R0    ;PRINT MESSAGE
    015122 004767 003430                JSR     PC,TYPOUT      ;POINTED TO BY REMCHG
25 015126                PNTM    REMSG      ;PRINT "REMOTE # "
    015126 012700 025255                MOV      #REMSG,R0    ;PRINT MESSAGE
    015132 004767 003420                JSR     PC,TYPOUT      ;POINTED TO BY REMSG
26 015136 012777 001003 015330        MOV      #1003,BSPAR
27 015144 017700 015326                MOV      BSPDR,R0
28 015150 004767 004432                JSR     PC,OCTPNT
29 015154                PNTM    REMSTM      ;GET THE REMOTE NUMBER
    015154 012700 025424                MOV      #REMSTM,R0   ;PRINT IT
    015160 004767 003372                JSR     PC,TYPOUT      ;PRINT "REMOTE STATUS NOW "
30 015164 005277 015304                INC      BSPAR         ;PRINT MESSAGE
31 015170 032777 000040 015300        BIT      #B05,BSPDR    ;POINTED TO BY REMSTM
32 015176 001405                BEQ      SCA2A        ;NOW REGULAR?
33 015200                PNTM    REGMG      ;NO
    015200 012700 025450                MOV      #REGMG,R0    ;YES, PRINT "REGULAR"
    015204 004767 003346                JSR     PC,TYPOUT      ;PRINT MESSAGE
34 015210 000416                BR      SCA2C        ;POINTED TO BY REGMG
35 015212 032777 000100 015256        SCA2A: BIT      #B06,BSPDR ;IRREGULAR?
36 015220 001405                BEQ      SCA2B
37 015222                PNTM    IRRGMG      ;YES, PRINT "IRREGULAR"
    015222 012700 025461                MOV      #IRRGMG,R0   ;PRINT MESSAGE
    015226 004767 003324                JSR     PC,TYPOUT      ;POINTED TO BY IRRGMG
38 015232 000410                BR      SCA2D
39 015234 017700 015236                SCA2B: MOV      BSPDR,R0 ;OTHERWISE, JUST PRINT THE STATUS

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CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 23-1
 MOST-REMOTE EXERCISE

40	015240	004767	004342		JSR	PC,OCTPNT	
41	015244	000410			BR	SCA2E	;AND LEAVE THE TALLY ALONE
42	015246	005267	015234	SCA2C:	INC	TALLY	;UPDATE TALLY FOR ADDED REMOTE
43	015252	000405			BR	SCA2E	
44	015254	005767	015226	SCA2D:	TST	TALLY	;IS TALLY ALREADY =0?
45	015260	001402			BEQ	SCA2E	;YES, FORGET IT
46	015262	005367	015220		DEC	TALLY	;NO, MAKE IT ONE LESS
47	015266	005767	015214	SCA2E:	TST	TALLY	;IS TALLY NOW 0?
48	015272	001006			BNE	SCA2F	;NO, O.K.
49	015274	105067	015106		CLRB	ONCE	;YES, HAVE TO START OVER
50	015300				PNTM	ALROFF	;PRINT "ALL REMOTES ARE IRREGULAR"
	015300	012700	025474		MOV	@ALROFF,RO	;PRINT MESSAGE
	015304	004767	003246		JSR	PC,TYPOUT	;POINTED TO BY ALROFF
51	015310	012767	177777	015106	SCA2F:	MOV	@-1,CHNGFL
52	015316	052777	000020	015106	BIS	@20,@CSR	;SET CHANGE FLAG
53	015324	000167	177500		JMP	SCA1	;CLEAR TOP BYTE
54	015330	032777	004000	015074	SCA3:	BIT	@B11,@CSR
55	015336	001406			BEQ	SCART	;GO SEE IF ANY MORE CHANGES.
56	015340	112767	177777	015045	MOVB	@-1,THRU	;IS THRU SET?
57	015346	052777	000020	015056	BIS	@20,@CSR	;NO, LEAVE
58	015354	000207			SCART:	RTS	;YES, SET THE "THRU" FLAG
						PC	;CLEAR TOP BYTE

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 24
 MOST REMOTE EXERCISE

```

1      ;SUBROUTINE TO PERFORM "PORT CONFIGURATION STATUS" ON A GIVEN
2      ;PORT AND STORE THE RESULTS IN A GIVEN TABLE. ALSO
3      ;STORED IS THE STATUS OF EACH REMOTE
4      ;FOR EACH REGULAR REMOTE FOUND, A TALLY IS INCREMENTED
5
6      ;TABLES ARE IN THE FOLLOWING FORMAT:
7
8      ;      [ # OF ENTRIES ]
9      ;      [REM STAT][REM # ]
10     ;      [ " " ][ " " ]
11
12 015356 016701 015126      PORCNF: MOV      TBLAD,R1      ;TABLE ADDR GIVEN BY CALLER
13 015362 052777 000020 015042  BIS      #B04,@CSR      ;CLR TOP BYTE OF CSR
14 015370 005077 015100      CLR      @SPAR          ;ADDR REQ. SCPD
15 015374 012777 000140 015074  MOV      #140,@SPDR     ;LOAD PORT CONF. ST. FUNC.
16 015402 005277 015066      INC      @SPAR          ;
17 015406 012777 000002 015062  MOV      #2,@SPDR       ;DATA LEN. = 2
18 015414 005277 015054      INC      @SPAR          ;
19 015420 012777 000001 015050  MOV      #1,@SPDR       ; ONE REQUEST
20 015426 005277 015042      INC      @SPAR          ;
21 015432 016777 015016 015036  MOV      PORN,@SPDR     ;PORT # GIVEN BY CALLER
22 015440 004767 177322      JSR     PC,SCALM        ;CLEAR ALARMS & CHANGES
23 015444 052777 000001 014760  BIS      #B00,@CSR      ;START FUNCTION
24 015452 032777 040000 014752  PORO:  BIT      #B14,@CSP   ;FUNCTION COMPLETE?
25 015460 001003      BNE     POROO           ;NO, WAIT
26 015462 004767 177300      JSR     PC,SCALM        ;SCAN ALARMS AGAIN
27 015466 000771      BR      PORO           ;
28 015470 004767 002456      POROO: JSR     PC,MONIT   ;
29 015474 012777 001000 014772  MOV      #1000,@SPAR    ;ADDR RESULT SCPD
30 015502 027727 014770 000140  CMP      @SPDR,#140     ;THIS RESULT FROM PORT CONFIG?
31 015510 001415      BEQ     POR1           ;
32 015512      ERROR  \N,YSER      ;ERROR:HOST SYS ERROR. RUN LOGIC TEST
                        ;***** ERROR 54 *****
33 015512 032777 040000 014760  BIT      #B14,@SR      ;
34 015520 001007      BNE     .+20           ;
35 015522 012700 030607      MOV      @YSER,RO      ;
36 015526 012767 000054 002340  MOV      #54,ERRNUM    ;
37 015534 004767 002166      JSR     PC,ERR         ;
38 015534 000055      N      =             N+1
39 015540      HLT
40 015540 004767 001710      JSR     PC,SIMLT       ;
41 015544 005277 014724      POR1:  INC      @SPAR    ;GET # OF REMOTES
42 015550 017700 014722      MOV      @SPDR,RO     ;
43 015554 006200      ASR     RO            ;DIVIDE BY 4
44 015556 006200      ASR     RO            ;
45 015560 010021      MOV      RO,(R1)+     ;SAVE AS # OF ENTRIES
46 015562 001002      BNE     PORLD        ;IF MORE THAN 0, LOAD THEM
47 015564 000167 000042      JMP     PORXT        ;IF NONE, EXIT
48 015570 010067 014634      PORLD: MOV      RO,CNTR ;GET # OF ENTRIES
49 015574 012777 001003 014672  MOV      #1003,@SPAR   ;
50 015602 117721 014670      PORCN: MOVB   @SPDR,(R1)+ ;LOAD REMOTE #
51 015606 005277 014662      INC      @SPAR        ;
52 015612 117721 014660      MOVB   @SPDR,(R1)+   ;LOAD REM. STATUS
53 015616 062777 000003 014650  ADD      #3,@SPAR     ;
54 015624 005367 014600      DEC     CNTR         ;GOT THEM ALL?
55 015630 001364      BNE     PORCN        ;NO, GET THE REST
56 015632 005767 014616      PORXT: TST     PORN    ;PORT 0?

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 24-1
MOST-REMOTE EXERCISE

50 015636 001002
51 015640 005067 014642
52 015644 060067 014636 18:
53 015650 052777 000020 014554
54 015656 000207

BNE 18
CLR TALLY
ADD RO,TALLY
BIS #B04,BCSR
RTS PC

;NO, NEVER MIND
;YES, CLEAR TALLY
;UPDATE TALLY
;CLR TOP BYTE
;AND RETURN

CZCMJCO CTR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 25
 MOST-REMOTE EXERCISE

```

1          ;SUBROUTINE TO REPORT THE STATUS OF EACH PORT WHICH HAS ANY
2          ;REMOTES ATTACHED AND REGULAR
3
4 015660   REPORT: PNTM   CONFMS   ;PRINT *** PORT CONFIGURATION ***
015660   012700   025267   MOV      @CONFMS,RO ;PRINT MESSAGE
015664   004767   002666   JSR     PC,TYPOUT ;POINTED TO BY CONFMS
5 015670   105067   014513   CLR     PNCFLG   ;CLR "PRINTED SOMETHING" FLAG
6 015674   012767   000006   014540   MOV     @6,LINLEN ;ALLOW 6 REM'S PER LINE.
7 015702   012701   031326   MOV     @EXTBL1,R1 ;GET PORT TABLE
8 015706   012167   014516   MOV     (R1),.CNTR ;GET # OF REMOTES
9 015712   001407   ;          BEQ     REPO      ;NONE HERE, NEXT PORT
10 015714   105267   014467   INCB   PNCFLG   ;SET FLAG
11 015720   012767   000000   014526   MOV     @0,PORN  ;LOAD PORT NO.
12 015726   004767   000130   JSR     PC,PRNREM ;GO PRINT REMOTES ON THIS PORT
13 015732   012701   031526   REPO:  MOV     @EXTBL2,R1
14 015736   012167   014466   MOV     (R1),.CNTR ;GET # OF REMOTES
15 015742   001407   ;          BEQ     REP1     ;NONE HERE, NEXT PORT
16 015744   105267   014437   INCB   PNCFLG   ;SET FLAG
17 015750   012767   000001   014476   MOV     @1,PORN  ;GO PRINT REMOTES ON THIS PORT
18 015756   004767   000100   JSR     PC,PRNREM
19 015762   012701   031726   REP1:  MOV     @EXTBL3,R1
20 015766   012167   014436   MOV     (R1),.CNTR ;GET # OF REMOTES
21 015772   001407   ;          BEQ     REP2     ;NONE HERE, NEXT PORT
22 015774   105267   014407   INCB   PNCFLG   ;SET FLAG
23 016000   012767   000002   014446   MOV     @2,PORN  ;GO PRINT REMOTES ON THIS PORT
24 016006   004767   000050   JSR     PC,PRNREM
25 016012   012701   032126   REP2:  MOV     @EXTBL4,R1
26 016016   012167   014406   MOV     (R1),.CNTR ;GET # OF REMOTES
27 016022   001407   ;          BEQ     REP20    ;NONE WE'RE DONE
28 016024   105267   014357   INCB   PNCFLG   ;SET FLAG
29 016030   012767   000003   014416   MOV     @3,PORN  ;GO PRINT REMOTES ON THIS PORT
30 016036   004767   000020   JSR     PC,PRNREM ;PRINTED ANYTHING?
31 016042   105767   014341   REP20: TSTB   PNCFLG ;YES, FINE.
32 016046   001004   ;          BNE     REP3     ;NO, SAY ALL ARE IRREGULAR.
33 016050   012700   025474   MOV     @ALROFF,RO ;PRINT MESSAGE
016054   004767   002476   JSR     PC,TYPOUT ;POINTED TO BY ALROFF
34 016060   000207   ;          REP3:  RTS      PC ;RETURN WHEN DONE

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CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 26
 MOST REMOTE EXERCISE

```

1          ;SUBROUTINE TO DO THE PRINTING PART OF PORT CONFIGURATION REPORT.
2          ;R1 POINTS AT FIRST REMOTE #
3          ;PORN = PORT #
4          ;CNTR = # OF REMOTES ON THIS PORT
5
6
7 016062    PRNREM: PNTM      PORTMS      ;PRINT "PORT # "
016062    MOV      @PORTMS,RO  ;PRINT MESSAGE
016066    JSR      PC, TYP0UT  ;POINTED TO BY PORTMS
8 016072    MOV      PORN,RO    ;GET PORT #
9 016076    JSP      PC, OCTPNT ;PRINT IT
10 016102   PREMO:  MOVB      (R1),RO    ;GET REMOTE #
11 016104   BIC      @177400,RO  ;CLR HIGH BYTE
12 016110   JSR      PC, OCTJSP  ;PRINT IT
13 016114   MOV      @'(,RO     ;BRACKET THE STATE
14 016120   JSR      PC, TTO
15 016124   MOVB      (R1),RO    ;GET REM. STATE
16 016126   BIC      @177400,RO  ;CLEAR THE JUNK OFF
17 016132   JSR      PC, OCTPNT  ;PRINT THE STATE
18 016136   MOV      @'),RO     ;CLOSE BRACKETS
19 016142   JSR      PC, TTO
20 016146   DEC      CNTR
21 016152   BEQ      PREML
22 016154   DEC      LINLEN
23 016160   BNE      PREMO
24 016162   MOV      @6,LINLEN   ;YES, RESTORE LIN.LEN
25 016170   MOV      @15,RO
26 016174   JSR      PC, TTO
27 016200   MOV      @7,CLK
28 016206   MOV      @40,RO
29 016212   PREML: JSR      PC, TTO
30 016216   DEC      CLK
31 016222   BNE      PREML
32 016224   JMP      PREMO
33 016230   PREML: MOV      @15,RO   ;ANOTHER <CR>
34 016234   JSR      PC, TTO
35 016240   MOV      @6,LINLEN
36 016246   RTS      PC          ;AND RETURN

```



```

1          ;SUBROUTINE TO DO DIAGNOSTIC FUNCTION ON A GIVEN REMOTE
2          ;ENTER WITH REMOTE # IN "REMNO"
3
4
5 016250 012767 000020 014150 DIAGNF: MOV    #20,CLK          ;SET UP TO LOAD REQUEST
6 016256 012702 031266          MOV    #DATBL,R2
7 016262 005077 014206          CLR    BSPAR          ;ADDRESS REQ SCR PAD
8 016266 012777 000100 014202  MOV    #100,BSPDR     ;LOAD "DIAG" FUNC
9 016274 005277 014174          INC    BSPAR
10 016300 012777 000022 014170  MOV    #22,BSPDR     ;DATA LEN. = 22
11 016306 005277 014162          INC    BSPAR
12 016312 012777 000001 014156  MOV    #1,BSPDR     ;ONE REQUEST
13 016320 005277 014150          INC    BSPAR
14 016324 016777 014134 014144  MOV    REMNO,BSPDR   ;LOAD REMOTE #
15 016332 005277 014136          DIAGO: INC    BSPAR
16 016336 012277 014134          MOV    (R2)+,BSPDR  ;LOAD DATA PATTERN
17 016342 005367 014060          DEC    CLK
18 016346 001371          BNE    DIAGO
19 016350 004767 176412          DIAG00: JSR   PC,SCALM ;CLEAR ALARMS ETC.
20 016354 052777 000020 014050  BIS    #B04,BCSR    ;CLR TOP BYTE
21 016362 052777 000001 014042  BIS    #B00,BCSR    ;SET START FUNC.
22 016370 032777 040000 014034  DIAG1: BIT    #B14,BCSR ;FUN COMPL?
23 016376 001003          BNE    DIAG10
24 016400 004767 176362          JSR   PC,SCALM     ;NO. WAIT FOR IT
25 016404 000771          BR    DIAG1
26 016406 012777 001000 014060  DIAG10: MOV   #1000,BSPAR ;ADDRESS RESULT SCR. PAD
27 016414 012767 000100 001454  MOV   #100,GOOD     ;RIGHT FUNCTION?
28 016422 017767 014050 001450  MOV   BSPDR,BAD
29 016430 026767 001442 001442  CMP   GOOD,BAD
30 016436 001416          BEQ   DIAG2
31 016440          DATERR \N,DIAGF          ;ERROR:DIAG FUNC GAVE WRONG FUNC CODE
                                ;***** ERROR 55 *****
    016440 032777 040000 014032  BIT   #B14,BSR
    016446 001007          BNE   .+20
    016450 012700 030650          MOV   #DIAGF,RO
    016454 012767 000055 001412  MOV   #55,ERRNUM
    016462 004767 001324          JSR   PC,DERR
    000056          =    N+1
32 016466          N
    016466 004567 001002          SCOPE DIAG00
    016472 016350          JSR   R5,SCPRTN
33 016474 062777 000002 013772  DIAG2: ADD   #2,BSPAR          ;CHECK FUNCTION STATUS
34 016502 012767 000001 001366  MOV   #1,GOOD       ;SHD SHOW SUCCESS
35 016510 017767 013762 001362  MOV   BSPDR,BAD
36 016516 026767 001354 001354  CMP   GOOD,BAD
37 016524 001460          BEQ   DIAG4
38 016526          DATERR \N,DIAGUF          ;O.K.
                                ;ERROR:USOF WRONG ON "DIAG" FUNC
                                ;***** ERROR 56 *****
    016526 032777 040000 013744  BIT   #B14,BSR
    016534 001007          BNE   .+20
    016536 012700 030713          MOV   #DIAGUF,RO
    016542 012767 000056 001324  MOV   #56,ERRNUM
    016550 004767 001236          JSR   PC,DERR
    000057          =    N+1
39 016554 032777 040000 013716  BIT   #B14,BSR          ;PRINT ALLOWED?
40 016562 001036          BNE   DIAG3S       ;NO, SKIP IT
41 016564          PNTM  REMSG          ;PRINT "REMOTE # "
    
```

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 27-1
 MOST-REMOTE EXERCISE

016564	012700	025255		MOV	#REMSG,RO			;PRINT MESSAGE
016570	004767	001762		JSR	PC,TYPOUT			;POINTED TO BY REMSG
42 016574	005277	013674		INC	BSPAR			
43 016600	017700	013672		MOV	BSPDR,RO			;GET REM. NO.
44 016604	004767	002776		JSR	PC,OCTPNT			;PRINT IT
45 016610				PNTM	STATEM			;PRINT "STATE "
016610	012700	025323		MOV	#STATEM,RO			;PRINT MESSAGE
016614	004767	001736		JSR	PC,TYPOUT			;POINTED TO BY STATEM
46 016620	005277	013650		INC	BSPAR			
47 016624	017700	013646		MOV	BSPDR,RO			;GET STAE OF REMOTE
48 016630	004767	002752		JSR	PC,OCTPNT			
49 016634				PNTM	USORM			;PRINT "USOR = "
016634	012700	025335		MOV	#USORM,RO			;PRINT MESSAGE
016640	004767	001712		JSR	PC,TYPOUT			;POINTED TO BY USORM
50 016644	005277	013624		INC	BSPAR			
51 016650	017700	013622		MOV	BSPDR,RO			
52 016654	004767	002726		JSR	PC,OCTPNT			
53 016660			DIAG3S:	SCOPE	DIAG00			
016660	004567	000610		JSR	R5,SCPRTN			
016664	016350			DIAG00				
54 016666	052777	000020	013536	DIAG4:	BIS	#B04,BCSR		;CLEAR TOP BYTE WHEN DONE
55 016674	000207			RTS	PC			

.SBTTL MAINTENANCE ROUTINE

```

1
2
3
4           ;THIS ROUTINE WORKS LIKE OOT BASICALLY BUT
5           ;ONLY ON THE CMR-11 SCRATCHPAD MEMORY.
6           ;THE REQUEST SCR. PAD MAY BE LOADED/READ
7           ;TYPING "G" CAUSES EXECUTION OF THE FUNCTION
8           ;LOADED. COMPLETION OF THE FUNCTION CAUSES
9           ;THE FIRST LOCATION OF THE RESULT SCR. PAD
10          ; TO BE PRINTED.
11          ;THE CMR-11 CSR MAY BE EXAMINED BY TYPING
12          ; IT'S BUS ADDRESS FOLLOWED BY SLASH (/)
13          ; EXIT IS ACHIEVED BY TYPING CNTRL-C
14          ;OR "P" TO PROCEED TO THE POINT AT WHICH THE
15          ;MAIN PROGRAM WAS INTERRUPTED.
16
17 016676 105767 013471      OOTPR:  TSTB      CLKFLG      ;STOP CLOCK WHILE WE'RE HERE
18 016702 001404              BEQ          $00$        ;BY CLEARING INTR ENAB
19 016704 017746 013622      MOV          BLS, -(SP)  ;IF IT'S SET
20 016710 005077 013616      CLR          BLS
21 016714 112767 177777 013454 $00$:  MOVB       #-1, DBFLG   ;SET DEBUG FLAG
22 016722 017767 013504 013542      MOV          BCSR, SAVEC ;SAVE CSR FOR LOOKING AT
23 016730              PNTM      DBAID          ;PRINT "CMR-11 DEBUG AID"
24          016730 012700 022742      MOV          @DBAID, RO  ;PRINT MESSAGE
25          016734 004767 001616      JSR          PC, TYP0UT ;POINTED TO BY DBAID
26 016740 005067 013452      CLR          ADDR
27 016744 016767 013446 002556 $0$:  MOV          ADDR, KBBUF ;GET ADDRESS
28 016752 004767 001642      JSR          PC, INPKB  ; FROM KEYBOARD
29 016756 016767 002546 013432      MOV          KBBUF, ADDR
30 016764 026727 013426 001777      CMP          ADDR, #1777 ;WITHIN LIMIT?
31 016772 101423              BLOS       $2$        ;YES, O.K.
32 016774 026767 013416 013430      CMP          ADDR, CSR  ;IS IT THE CSR?
33 017002 001012              BNE       $10$       ;NO
34 017004 017700 013422      MOV          BCSR, RO
35 017010 004767 002620      JSR          PC, OCTJSP ;YES, SHOW CONTENTS OF CSR
36 017014 012700 000015      MOV          #15, RO
37 017020 004767 003076      JSR          PC, T10
38 017024 000167 177710      JMP          $0$
39 017030              PNTM      AGAIN
40          017030 012700 022624      MOV          @AGAIN, RO ;PRINT MESSAGE
41          017034 004767 001516      JSR          PC, TYP0UT ;POINTED TO BY AGAIN
42 017040 000741              BR          $1$
43 017042 105767 013344      TSTd       SLFL      ;SLASH HIT?
44 017046 001042              BIF       $11$      ;YES DUMP DATA
45 017050 105767 013324      T51B      GOFLG     ;"G" TYPED?
46 017054 001462              BEQ       $20$      ;NO
47 017056 052777 000020 013346 $2A$:  BIS       #B04, BCSR  ;INSURE TOP BYTE CLEAR
48 017064 005077 013404      CLR          BSPAR    ;ADDRESS FUNC. CODE
49 017070 027727 013402 000151      CMP          BSPDR, #151 ;IS FUNC NOT MAINT?
50 017076 101404              BLOS       $3$        ;IT'S NOT MAINT. DO IT
51 017100 052777 000200 013324      BIS       #B07, BCSR  ;IT IS MAINT, SET "MAIN"
52 017106 000403              BR          $4$
53 017110 052777 000001 013314 $3$:  BIS       #B00, BCSR  ;SET "STFUN"
54 017116 032777 100000 013306 $4$:  BIT       #B15, BCSR  ;IS THERE AN INTR?
55 017124 001003              BNE       $5$        ;YES, SEE WHAT IT IS
56 017126 004767 001020      JSR          PC, MONIT
57 017132 000771              BR          $4$
    
```

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 28-1
 MAINTENANCE ROUTINE

54	017134	012767	001000	013254	\$5\$:	MOV	#1000,ADDR	;ADDRESS RESULT
55	017142	012700	000015			MOV	#15,RO	
56	017146	004767	002750			JSR	PC,TTO	;DO <CR>
57	017152	000430				BR	\$21\$	
58	017154	016777	013236	013312	\$11\$:	MOV	ADDR,BSPAR	;LOAD "ADDRESS"
59	017162	017700	013310			MOV	BSPDR,RO	;GET "CONTENTS"
60	017166	004767	002442			JSR	PC,OCTJSP	;AND PRINT IT
61	017172					PNTM	TWOSP	;SPACE AND PROMPT (:)
	017172	012700	023071			MOV	#TWOSP,RO	;PRINT MESSAGE
	017176	004767	001354			JSR	PC,TYPOUT	;POINTED TO BY TWOSP
62	017202	017767	013270	002320		MOV	BSPDR,KBBUF	
63	017210	004767	001404			JSR	PC,INPKB	;GET KBD INPUT
64	017214	016777	002310	013254		MOV	KBBUF,BSPDR	;LOAD ANY NEW INPUT
65	017222	105767	013154		\$20\$:	TSTB	INCF	;LINE FEED?
66	017226	001421				BEQ	\$13\$	
67	017230	005267	013162			INC	ADDR	;IF YES, INCREMENT ADDRESS
68	017234	016700	013156		\$21\$:	MOV	ADDR,RO	
69	017240	020027	001777			CMP	RO,#1777	;VALID ADDRESS?
70	017244	101402				BLOS	\$22\$;YES, O.K.
71	017246	000167	177556			JMP	\$10\$;NO GOOD. GET A NEW ONE!
72	017252	004767	002330		\$22\$:	JSR	PC,OCTPNT	;PRINT NEW ADDRESS
73	017256	012700	000057			MOV	#',RO	;PRINT A SLASH
74	017262	004767	002634			JSR	PC,TTO	
75	017266	000167	177662			JMP	\$11\$;GO PRINT CONTENTS
76	017272	105767	013114		\$13\$:	TSTB	SLFL	;SLASH TYPED?
77	017276	001402				BEQ	\$23\$;NO, CHECK IF IT'S "P"
78	017300	000167	177650			JMP	\$11\$;YES, SHOW CONTENTS
79	017304	105767	013064		\$23\$:	TSTB	CONFLG	; "P" TYPED?
80	017310	001004				BNE	\$25\$;NO, MUST BE <CR>
81	017312	105767	013062			TSTB	GOFLG	; "G" TYPED?
82	017316	001257				BNE	\$2A\$;YES, START FUNCTION
83	017320	000611				BR	\$1\$	
84	017322	105767	013045		\$25\$:	TSTB	CLKFLG	;CHECK ON CLOCK FLAG
85	017326	001402				BEQ	\$26\$;NO CLOCK, SKIP
86	017330	012677	013176			MOV	(SP)+,BLCS	;RESTORE CLOCK IF GOING
87	017334	105067	013036		\$26\$:	CLRB	DBFLG	;CLEAR DEBUG FLAG
88	017340	005767	013106			TST	PCONT	;ANY PROMPTS PENDING?
89	017344	001402				BEQ	\$24\$;NO, JUST RETURN TO CALLER
90	017346	016716	013100			MOV	PCONT,(SP)	;YES, RETYPE PROMPT.
91	017352	000207			\$24\$:	RTS	PC	;UNOFFICIAL RETURN

CZCMJCO CMR(V) 11 MUST EXERCISE MACRO V04.00 02:24:05 PAGE 29
UTILITY ROUTINES

```

1
2
3
4
5
6
7
8 017354 010446
9 017356 010346
10 017360 010246
11 017362 010146
12 017364 010046
13 017366 000115
14
15 017370 030026
16 017372 012600
17 017374 012601
18 017376 012602
19 017400 012603
20 017402 012604
21 017404 000205
22
23
24
25 017406 112767 177777 012767
26 017414 000002
27
28
29
30 017416 012767 032502 013054
31 017424 012767 177777 013052
32 017432 000002
33
34
35
36 017434 012706 002000
37 017440
   017440 012700 022767
   017444 004767 001106
38 017450 000167 162442
39
40
41
42
43 017454 005767 013024
44 017460 001403
45 017462 004767 000516
46 017466 000207
47 017470 000000
48 017472 000207
49
50
51
52 017474 004767 000452
53 017500 005777 012774
54 017504 100402
55 017506

```

.SBTTL UTILITY ROUTINES

```

;ROUTINES TO SAVE AND RESTORE GENERAL REGISTERS
; CALLED BY JSR R5,REGSAV
; AND JSR R5,REGRES

REGSAV: MOV R4,-(SP)
        MOV R3,-(SP)
        MOV R2,-(SP)
        MOV R1,-(SP)
        MOV R0,-(SP)
        JMP @R5

REGRES: BIT R0,(SP)+
        MOV (SP)+,R0
        MOV (SP)+,R1
        MOV (SP)+,R2
        MOV (SP)+,R3
        MOV (SP)+,R4
        RTS R5
;THROW AWAY OLD R5 VALUE

;ROUTINE TO SET LSI-11 FLAG (SOFTWARE)
LSTST: MOVB @-1,LSIFLG
        RTI
;SET LSI-11 SOFTWARE FLAG
;RETURN

;ROUTINE TO SET SOFTWARE SWITCH REGISTER FLAG
SRTST: MOV @SSWR,SR
        MOV @-1,SWRFLG
        RTI
;NO HARDWARE SWR, USE
; MEMORY LOCATION
; AND SET FLAG

;ROUTINE TO PRINT ILLEGAL DEVICE ADDRESS
DVATST: MOV @ISP,SP
        PNTM INVLAD
        MOV @INVLAD,R0
        JSR PC,TYPOUT
        JMP PROMT
;FIX THE STACK
;PRINT NON-EXST ADDR MSG
;PRINT MESSAGE
;POINTED TO BY INVLAD
;GO GET CORRECT ADDRESS

;ROUTINE TO REPLACE HALT WITH CALL TO SW MONITOR
;ON NON SWR PROCESSORS (CALLED BY MACRO "HLT")
SWHLT: TST SWRFLG
        BEQ 14
        JSR PC,SWDMP
        RTS PC
14: HALT
        RTS PC
;ANY HARDWARE SWR?
;IF YES, GO HALT
;IF NO, DUMP SWITCHES
;CONTINUE
;REAL HALT
;CONTINUE

;ROUTINE USED FOR LOOPING ON ERROR ROUTINE (CALLED BY MACRO "SCOPE")
SCPRTN: JSR PC,MONIT
        TST @SR
        BMI SBAK
        HLT
;CHECK FOR ↑G, OR ↑C
;IS SW 15 SET?
;YES, DON'T HALT
;COMMON ERROR HALT

```

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 29-1
UTILITY ROUTINES

```

017506 004767 177742
56 017512 012500
57 017514 032777 020000 012756
58 017522 001402
59 017524 012605
60 017526 000110
61 017530 005267 012702
62 017534 001003
63 017536 112767 177777 012641
64 017544 000205
65
66
67 ;ROUTINE TO GENERATE CSC DEVICE ADDRESSES FROM "DEVADR"
68
69 017546 016700 012750
70 017552 010067 012654
71 017556 062700 000002
72 017562 010067 012706
73 017566 062700 000002
74 017572 010067 012700
75 017576 016700 012716
76 017602 012760 000340 000002
77 017610 000207
78
79 ;ROUTINE TO PRINT DEFAULT VALUES FOR PROMPTS AT FRONT END.
80 ; ENTER WITH DEFAULT VALUE IN LOC. KBBUF
81
82 017612 012700 000050
83 017616 004767 002300
84 017622 016700 001702
85 017626 004767 001754
86 017632 012700 000051
87 017636 004767 002260
88 017642 012700 000040
89 017646 004767 002250
90 017652 000207
91
92 ;ROUTINE TO CATCH ERROR TRAPS TO LOC 4
93
94 017654 011667 012632
95 017660 012706 002000
96 017664
017664 012700 023033
017670 004767 000662
97 017674 162767 000002 012610
98 017702 016700 012604
99 017706 004767 001674
100 017712 004767 002052
101 017716 012706 002000
102 017722 000167 162572
103
104
105 ;ERROR ROUTINES: REGULAR ERRORS AND DATA ERRORS.
106
107
108 017726 011667 000140
109 017732 162767 000026 000132

```

```

        JSR    PC,SWHLT
SBAK:   MOV    (R5),R0          ;GET DIRECTION FOR SCOPE LOOP
        BIT    #B13,R5R        ;SW 13 SET?
        BEQ    SCONT           ;NO, DON'T LOOP
        MOV    (SP),R5         ;YES, RESTORE R5
        JMP    (R0)            ;AND LOOP
SCONT:  INC    ERRCNT          ;UPDATE ERR CNT IF "FALL THRU"
        BNE    SCORTN         ;WATCH FOR ERRCNT OFLO
        MOVB   #-1,OFLOF       ;SET OVERFLO FLAG.
SCORTN: RTS    R5              ;AND RETURN

```

;ROUTINE TO GENERATE CSC DEVICE ADDRESSES FROM "DEVADR"

```

DEVGEN: MOV    DEVADR,R0       ;GET DEVICE CSR ADDRESS
        MOV    R0,CSR          ;GENERATE CSR
        ADD    #2,R0
        MOV    R0,SPAR        ;GENERATE SPAR
        ADD    #2,R0
        MOV    R0,SPDR        ;GENERATE SPDR
        MOV    VECTOR,R0
        MOV    #340,2(R0)
        RTS    PC              ;RETURN

```

;ROUTINE TO PRINT DEFAULT VALUES FOR PROMPTS AT FRONT END.
; ENTER WITH DEFAULT VALUE IN LOC. KBBUF

```

PRDFLT: MOV    #'(,R0          ;GET OPEN PARENTHESIS
        JSR    PC,ITO          ;PRINT IT
        MOV    KBBUF,R0        ;GET DEFAULT VALUE
        JSR    PC,OCTPNT       ;PRINT IT
        MOV    #' ),R0         ;GET CLOSE PARENTHESIS
        JSR    PC,ITO          ;PRINT IT
        MOV    #' ,R0          ;AND PRINT A SPACE
        JSR    PC,ITO
        RTS    PC

```

;ROUTINE TO CATCH ERROR TRAPS TO LOC 4

```

HDER:   MOV    (SP),TEMP       ;SAVE STACK FOR ADDR OF TRAP
        MOV    #ISP,SP        ;RENEW STACK BEFORE USING
        PNTM   TRP4           ;PRINT "TRAPPED TO 4 FROM LOC "
        MOV    #TRP4,R0       ;PRINT MESSAGE
        JSR    PC,TYPOUT      ;POINTED TO BY TRP4
        SUB    #2,TEMP
        MOV    TEMP,R0
        JSR    PC,OCTPNT       ;PRINT SOURCE OF TRAP
        JSR    PC,MULLS
        MOV    #ISP,SP        ;REFRESH STACK POINTER
        JMP    RESTR

```

;ERROR ROUTINES: REGULAR ERRORS AND DATA ERRORS.

```

ERR:    MOV    (SP),ERRAD      ;GET ADDRESS OF ERROR CALL
        SUB    #26,ERRAD       ;CORRECT IT

```

```

110 017740 010046          ERR1:  MOV    RO,-(SP)      ;STACK ERROR MSG ADDR
111 017742                PNTM   ERRM          ;PRINT "**ERROR '
      017742 012700 020102  MOV    #ERRM,RO      ;PRINT MESSAGE
      017746 004767 000604  JSR    PC,TYPOUT     ;POINTED TO BY ERRM
112 017752 016700 000116  MOV    ERRNUM,RO     ;PRINT ERROR NO. (P)
113 017756 004767 001624  JSR    PC,OCTPNT     ;PRINT " AT LOC. "
114 017762                PNTM   WDAT          ;PRINT MESSAGE
      017762 012700 020115  MOV    #WDAT,RO      ;POINTED TO BY WDAT
      017766 004767 000564  JSR    PC,TYPOUT
115 017772 016700 000074  MOV    ERRAD,RO
116 017776 004767 001604  JSR    PC,OCTPNT     ;PRINT ADDRESS OF ERROR
117 020002 012600        MOV    (SP)+,RO      ;GET ADDR OF ERROR MSG
118 020004 004767 000546  JSR    PC,TYPOUT     ;PRINT ERR MSG
119 020010 000207        RTS     PC              ;RETURN
120
121

```

```

122 020012 011667 000054 000046 DERR:  MOV    (SP),ERRAD  ;GET ADDRESS OF ERROR CALL
123 020016 162767 000026  SUB    #26,ERRAD     ;CORRECT IT
124 020024 004767 177710  JSR    PC,ERR1       ;PRINT REG. ERROR MSG
125 020030                PNTM   WDSDB         ;PRINT "SHOULD BE "
      020030 012700 020127  MOV    #WDSDB,RO     ;PRINT MESSAGE
      020034 004767 000516  JSR    PC,TYPOUT     ;POINTED TO BY WDSDB
126 020040 016700 000032  MOV    GOOD,RO
127 020044 004767 001536  JSR    PC,OCTPNT     ;PRINT GOOD DATA
128 020050                PNTM   WDWAS         ;PRINT ", WAS "
      020050 012700 020143  MOV    #WDWAS,RO     ;PRINT MESSAGE
      020054 004767 000476  JSR    PC,TYPOUT     ;POINTED TO BY WDWAS
129 020060 016700 000014  MOV    BAD,RO
130 020064 004767 001516  JSR    PC,OCTPNT     ;PRINT BAD DATA
131 020070 000207        RTS     PC              ;RETURN
132
133

```

;RELATED STORAGE:

```

134
135
136 020072 000000  ERRAD:  .WORD  0
137 020074 000000  ERRNUM: .WORD  0
138 020076 000000  GOOD:   .WORD  0
139 020100 000000  BAD:    .WORD  0
140

```

;ASSOCIATED ASCII (ONLY SOME OF IT)

```

141
142
143
144 020102 046 046 052 ERRM:  .ASCII  /&&**ERROR @/
      020105 052 105 122
      020110 122 117 122
      020113 040 100
145 020115 040 101 124 WDAT:  .ASCII  / AT LOC. @/
      020120 040 114 117
      020123 103 056 040
      020126 100
146 020127 046 123 110 WDSDB: .ASCII  /&SHOULD BE @/
      020132 117 125 114
      020135 104 040 102
      020140 105 040 100
147 020143 054 040 127 WDWAS: .ASCII  / , WAS @/
      020146 101 123 040
      020151 100

```

K6

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 29 3
UTILITY ROUTINES

SEQ 0075

148

.EVEN


```

1
2
3
4
5
6
7
8
9
10
11 020152 005000
12 020154 105777 012350
13 020160 100402
14 020162 000167 000264
15 020166 017700 012334
16 020172 042700 177600
17 020176 020027 000007
18 020202 001056
19 020204
    020204 012700 023075
    020210 004767 000342
20 020214 017700 012260
21 020220 004767 001362
22 020224
    020224 012700 023071
    020230 004767 000322
23 020234 017767 012240 001266
24 020242 012767 020204 012202
25 020250 004767 000344
26 020254 005067 012172
27 020260 016777 001244 012212
28 020266
    020266 012700 023151
    020272 004767 000260
29 020276 105777 012226
30 020302 100375
31 020304 017700 012216
32 020310 042700 177600
33 020314 020027 000007
34 020320 001731
35 020322 020027 000120
36 020326 001363
37 020330 012700 000015
38 020334 004767 001562
39 020340 020027 000024
40 020344 001004
41 020346 012706 002000
42 020352 000167 162316
43 020356 020027 000017
44 020362 001002
45 020364 000167 176306
46
47 020370 020027 000003
48 020374 001004
49 020376 012706 002000
50 020402 000167 162266
51 020406 020027 000006

        .SBTTL "SWITCH" MONITOR ROUTINE
;ENTER AT MONIT FROM EVERY SUB-TEST TO SEE IF CNTRL-G OR CNTRL-C WAS TYPED
;ENTER AT SWDMP FROM ERROR HALTS IF SW 15 = 0
;ALSO MONITORS THE FOLLOWING CONTROL FUNCTIONS:
;      P CONTINUE (PROCEED)
;      CNTRL-O GO TO CMR-11 DEBUG ROUTINE
;      CNTRL-A DUMP PORT CONFIG TABLES

MONIT:  CLR      RO
        TSTB    BKBS      ;CHECK KEYBOARD FLAG
        BMI     MONIC    ;IF SET, CHECK WHAT CHAR.
        JMP     EX6      ;OTHERWISE, EXIT

MONIC:  MOV     BKBD,RO
MONCH:  BIC     #177600,RO ;TRIM OFF PARITY BIT
        CMP     RO,#07   ;WAS IT ^G?
        BNE     EX1      ;NO, EXIT
        PNTM    SWRMSG   ;PRINT "SWR = "
        MOV     #SWRMSG,RO ;PRINT MESSAGE
        JSR    PC,TYP0UT ;POINTED TO BY SWRMSG
        MOV     BSR,RO   ;GET CONTENTS OF SR
        JSR    PC,OCTPNT ;PRINT IT
        PNTM    TWOSP    ;SPACE AND PROMPT (:)
        MOV     #TWOSP,RO ;PRINT MESSAGE
        JSR    PC,TYP0UT ;POINTED TO BY TWOSP
        MOV     BSR,KBBUF ;LOAD OLD SWITCHES
        JSR    PC,INPKB  ;LOAD RETURN ADDRESS
        CLR     PCONT    ;GET KBD INPUT
        MOV     KBBUF,BSR ;LOAD NEW SWITCHES
        PNTM    TYPCTP   ;PRINT "P TO CONTINUE"
        MOV     #TYPCTP,RO ;PRINT MESSAGE
        JSR    PC,TYP0UT ;POINTED TO BY TYPCTP

CONTW1: TSTB    BKBS
        BPL     CONTW1
        MOV     BKBD,RO
        BIC     #177600,RO ;TRIM OFF PARITY BIT
        CMP     RO,#07   ;^G?
        BEQ     SWDMP    ;YES, GET SWR AGAIN
        CMP     RO,#'P   ;"P"?
        BNE     CONTW1  ;NO, KEEP LOOKING
        MOV     #15,RO   ;RETURN LINE
        JSR    PC,TTO
EX1:    CMP     RO,#24
        BNE     EX2
        MOV     #ISP,SP  ;WAS A ^T TYPED?
        JMP     BCONT    ;NO, EXIT
        ;YES, RENEW STACK
        ;BACK TO DISPATCHER

EX2:    CMP     RO,#17
        BNE     EX3
        JMP     ODTPR    ;WAS CNTRL-O TYPED?
        ;NO
        ;AND GO TO DEBUG ROUTINE

EX3:    CMP     RO,#3
        BNE     EX4
        MOV     #ISP,SP  ;WAS CNTRL-C TYPED?
        JMP     BCONT    ;NO.
        ;YES, REFRESH STACK
        ;AND RESTART

EX4:    CMP     RO,#6
        ;WAS IT ^F?
    
```

CZCMJCO CHR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 30 1
 "SWITCH" MONITOR ROUTINE

52	020412	001012		BNE	EX5		;NO, EXIT
53	020414	105767	011756	TSTB	DBFLG		;IS DEBUG FLAG SET?
54	020420	001007		BNE	EX5		;YES, JUST RETURN
55	020422	105767	011762	TSTB	SAFE		;ALREADY IN FILL RTN?
56	020426	001004		BNE	EX5		;YES, JUST RETURN
57	020430	005067	012016	CLR	PCONT		;CLEAR PROMPT CARRIER
58	020434	004767	000432	JSR	PC,KBRET		;SNEAK INTO FILL COUNT ROUTINE
59	020440	020027	000001	EX5: CMP	RO,#1		;WAS ↑A TYPED?
60	020444	001002		BNE	EX6		;NOPE, BYE!
61	020446	004767	001104	JSR	PC,PNTCNF		;YES, PRINT PORT CONFIG
62	020452	000207		EX6: RTS	PC		
63							
64							
65							;ROUTINE TO PRINT ELAPSED TIME SINCE START-UP OR CNTRL-C
66							
67	020454			PRNTIM: PNTM	ELTIM		;PRINT "EL. TIM. "
	020454	012700	024651	MOV	#ELTIM,RO		;PRINT MESSAGE
	020460	004767	000072	JSR	PC,TYPOUT		;POINTED TO BY ELTIM
68	020464	116700	011711	MOVB	HOURS,RO		;GET HOURS
69	020470	004767	001216	JSR	PC,DECPNT		;PRINT IN DECIMAL
70	020474	012700	000072	MOV	#':,RO		
71	020500	004767	001416	JSR	PC,TTO		;PRINT ":"
72	020504	116700	011674	MOVB	MINS,RO		;GET MINUTES
73	020510	004767	001176	JSR	PC,DECPNT		;PRINT IN DECIMAL
74	020514	012700	000072	MOV	#':,RO		
75	020520	004767	001376	JSR	PC,TTO		;ANOTHER ":"
76	020524	116700	011661	MOVB	SECS,RO		;GET SECS
77	020530	004767	001156	JSR	PC,DECPNT		;PRINT IN DECIMAL
78	020534	012700	000072	MOV	#':,RO		
79	020540	004767	001356	JSR	PC,TTO		;ANOTHER ":"
80	020544	116700	011644	MOVB	TICKS,RO		;GET TICKS (1/60 SEC)
81	020550	004767	001136	JSR	PC,DECPNT		;PRINT IN DECIMAL
82	020554	000207		RTS	PC		;RETURN

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 31
 MESSAGE PRINT ROUTINE

```

1          .SBTTL MESSAGE PRINT ROUTINE
2
3          ;MESSAGE TYP OUT ROUTINE (CALLED BY MACRO PNTM A)
4          ;MESSAGES ARE IN THE FORMAT:
5          ;   MSG:      .ASCII      /&MESSAGE&&/
6          ;
7          ;WHERE: & IS TRANSLATED INTO CR. AND LF.
8          ;
9          ;USES THE SUBROUTINE "TTO"
10         ;WHICH PRINTS CR. & LF. UPON SEEING A CR. CODE.
11         ;AND   @ IS MESSAGE TERMINATOR
12         ;
13         ;ENTER WITH ADDRESS OF MESSAGE IN RO
14
15 020556 010046          TYP OUT: MOV      RO, -(SP)          ;STACK ADDRESS OF MESSAGE
16 020560 117600 000000  TPOFCH: MOVB   @ (SP), RO      ;FETCH ASCII BYTE
17 020564 022700 000100          CMP      @100, RO          ;IS IT @ (TERMINATOR)?
18 020570 001411          BEQ      TPOUTX          ;YES-EXIT
19 020572 022700 000046          CMP      @46, RO          ;IS IT CRLF FLAG?
20 020576 001002          BNE      TPCONT          ;NO-TYPE CHARACTER
21 020600 012700 000015          MOV      @15, RO          ;YES, CHANGE DATA TO CR
22 020604 004767 001312  TPCONT: JSR      PC, TTO          ;TYPE IT
23 020610 005216          INC      (SP)          ;MOVE POINTER TO NEXT BYTE
24 020612 000762          BR       TPOFCH          ;FETCH NEXT CHARACTER
25 020614 005726          TPOUTX: TST   (SP)+        ;POP STACK TO REACH RETURN VECTOR
26 020616 000207          RTS      PC
27

```

CZCMLCO CHR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 32
KEYBOARD INPUT ROUTINE

```

1
2
3
4
5
6
7
8 020620 005067 000702      INPKB:  CLR      NOKEFL      ;CLEAR NO NUMBER FLAG
9 020624 010146              MOV      R1,-(SP)      ;STACK OLD R1
10 020624 016746 000676      MOV      KBBUF,-(SP)   ;STACK "OLD CONTENTS"
11 02063. 005067 000672      CLR      KBBUF        ;CLEAR INPUT BUFFER
12 020636 004767 000216      GETCHR: JSR      PC,KBRD ;FETCH A CHARACTER IN R0
13 020642 004767 001254      JSR      PC,TTO        ;ECHO IT
14 020646 020027 000012      CMP      R0,#12       ;WAS IT A CR OR LF?
15 020652 001002              BNE      11            ;NO
16 020654 000167 000154      JMP      NRTRN        ;YES, RETURN WITH PROPER KBBUF
17 020660 010001      11:      MOV      R0,R1        ;SET UP TO CHECK FOR A NUMBER
18 020662 042701 177407      BIC      #177407,R1   ;MASK ALL BUT # CODE
19 020666 020127 000060      CMP      R1,#60       ;IS IT A # FROM 0-7?
20 020672 001441              REQ      3            ;YES, PACK IT
21 020674 020027 000177      CMP      R0,#177     ;WAS IT A DELETE/RUBOUT?
22 020700 001024              BNE      21            ;NO, MUST BE GARBAGE
23 020702 012700 000057      MOV      #57,R0      ;YES, BUT PRINT "\"
24 020706 004767 001210      JSR      PC,TTO
25 020712 000241              CLC
26 020714 006067 000610      ROR      KBBUF        ;CLEAR THE C-BIT
27 020720 000241              CLC
28 020722 006067 000602      ROR      KBBUF        ;DELETE LAST DIGIT
29 020726 000241              CLC
30 020730 006067 000574      ROR      KBBUF        ; INTO KBBUF
31 020734 005767 000570      TST      KBBUF        ;HAVE WE DELETED EVERYTHING?
32 020740 001002              BNE      111          ;NO
33 020742 005067 000560      CLR      NOKEFL      ;YES, BACK TO NO NUMBER INPUT
34 020746 000167 177664      111:    JMP      GETCHR       ;GO FOR MORE INPUT
35 020752 012700 000207      21:      MOV      #207,R0     ;ECHO "BELL" FOR ERRONEOUS INPUT
36 020756 004767 001140      JSR      PC,TTO
37 020762 012700 000077      MOV      #77,R0
38 020766 004767 001130      JSR      PC,TTO
39 020772 000167 177640      JMP      GETCHR
40 020776 012767 177777 000522 31:      MOV      #-1,NOKEFL  ;AND GET ANOTHER CHARACTER
41 021004 042700 177770      BIC      #177770,R0  ;GOT A DIGIT, SET FLAG
42 021010 006367 000514      ASL      KBBUF        ;GET THE DIGIT PART OF THE CHARACTER
43 021014 006367 000510      ASL      KBBUF        ;SHIFT KBBUF BUFFER
44 021020 006367 000504      ASL      KBBUF        ; TO ACCEPT THE
45 021024 050067 000500      ASL      KBBUF        ; NEW DIGIT.
46 021030 000167 177602      BIS      R0,KBBUF    ;ADD THE NEW DIGIT
47                                JMP      GETCHR       ;GO FOR MORE INPUT
48 021034 005767 000466      NRTRN:  TST      NOKEFL  ;WAS THERE NEW DATA?
49 021040 001004              BNE      NEK          ;YES, GO BACK WITH IT
50 021042 012667 000462      MOV      (SP),KBBUF  ;NO, RETRIEVE OLD DATA
51 021046 012601              MOV      (SP),R1     ;RESTORE R1
52 021050 000207              RTS      PC          ;AND RETURN
53 021052 005726      NEK:    TST      (SP)    ;DUMP OLD DATA
54 021054 012601              MOV      (SP),R1     ;RESTORE R1
55 021056 000207              RTS      PC          ;AND RETURN
56

```

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 33
KEYBOARD INPUT ROUTINE

```

1      ;KEYBOARD READ ROUTINE
2      ;CHECKS FOR THE FOLLOWING SPECIAL CHARACTERS:
3      ;      CNTRL-C      RESTART PROG.
4      ;      CNTRL-F      CHANGE/SHOW FILL COUNT
5      ;      CNTRL-A      PRINT PORT CONFIGURATION
6      ;                      STATUS IF AVAILABLE.
7      ;      CNTRL-O      ENTER "DE-BUG" ROUTINE
8      ;                      UNLESS ALREADY THERE
9      ;                      OR UNLESS IN INITIAL DIALOGUE.
10     ; IF IN "DE-BUG" ROUTINE:
11     ;      <CR>          CLOSE LOCATION
12     ;      <LF>          CLOSE LOC. AND OPEN NEXT
13     ;      "/"          OPEN LOCATION
14     ;      "G"          SET START FUNC OR MAINT
15     ;      "P"          RETURN AND CONTINUE
16
17 021060 105777 011444      KBRD:  TSTB      @KBS      ;WAIT FOR INPUT FROM CONSOLE
18 021064 100375              BPL      KBRD
19 021066 017700 011434      MOV      @KBD,RO      ;PUT THE CHAR INTO RO
20 021072 105067 011304      KBRET:  CLRB      INCF      ;CLEAR FLAGS
21 021076 105067 011276      CLRB      GOFLG
22 021102 105067 011304      CLRB      SLFL
23 021106 105067 011262      CLRB      CONFLG
24 021112 042700 177600      BIC      @177600,RO      ;TRIM PARITY
25 021116 020027 000003      CMP      RO,#3          ;WAS ^C TYPED?
26 021122 001004              BNE      1#            ;YES, RESTART PROGRAM
27 021124 012706 002000      MOV      @ISP,SP
28 021130 000167 161540      JMP      BCONT
29 021134 105767 011236      1#:    TSTB      DBFLG      ;DON'T ALLOW ^F IN "DEBUG"
30 021140 001062              BNE      4#
31 021142 020027 000006      CMP      RO,#6          ;WAS CNTRL-F TYPED?
32 021146 001057              BNE      4#            ;NO
33 021150 105767 011234      2#:    TSTB      SAFE      ;ALREADY IN FILL CNT RTN?
34 021154 001401              BEQ      20#           ;NO, SAFE TO ENTER
35 021156 000562              BR       KRTN          ;YES, IGNORE CHARACTER
36 021160 021160 012700 021536 20#:    PNTM      FILMSG      ;PRINT "FILL COUNT - "
37 021164 004767 177366      MOV      @FILMSG,RO      ;PRINT MESSAGE
38 021170 112767 177777 011212  JSR      PC,TYP0UT      ;POINTED TO BY FILMSG
39 021176 016700 000330      MOVB     #-1,SAFE        ;SET FLAG
40 021202 004767 000400      JSR      PC,OCTPNT      ;SHOW FILL COUNT
41 021216 016767 000310 000304  PNTM      TWOSP         ;SPACE AND PROMPT
42 021224 004767 177370      MOV      @TWOSP,RO      ;PRINT MESSAGE
43 021230 026727 000274 000500  JSR      PC,TYP0UT      ;POINTED TO BY TWOSP
44 021236 101406              MOV      FILL,KBBUF      ;GET NEW COUNT
45 021240 012700 022624      CMP      KBBUF,#500     ;TOO BIG?
46 021244 004767 177306      BLOS     3#            ;NO GOOD. GET IT AGAIN
47 021250 000167 177704      MOV      @AGAIN,RO      ;PRINT MESSAGE
48 021254 016767 000250 000250  JSR      PC,TYP0UT      ;POINTED TO BY AGAIN
49 021262 005767 011164      JMP      20#           ;LOAD NEW COUNT
50 021270 062706 000006      3#:    MOV      KBBUF,FILL ;RETURNING TO A PROMPT?
51 021274 016716 011152      30#:   TST      PCONT      ;NO, CLEAN RETURN
52                      BEQ      34#           ;YES, BREAK UP WITH INPKB
53                      ADD      @6,SP        ;D.W 001
54                      MOV      PCONT,(SP)   ;MODIFY RETURN ADDR

```

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 33 1
KEYBOARD INPUT ROUTINE

```

52 021300 105067 011104      34:  CLR8  SAFE      ;CLEAR SAFETY FLAG      ;D.W 001
53 021304 000507              BR      KRTN
54 021306 020027 000001      4:   CMP      RO,#1      ;A TYPED?
55 021312 001012              BNE     40#          ;NO, SKIP
56 021314 105767 011070      TSTB   SAFE      ;IN FILL COUNT ROUTINE?
57 021320 001101              BNE     KRTN        ;IF YES, JUST EXIT.
58 021322 004767 000230      JSR    PC,PNTCNF   ;YES, GO PRINT TABLES
59 021326 105767 011044      TSTB   DBFLG      ;IN DEBUG??
60 021332 001074              BNE     KRTN        ;IF YES, NORMAL RETURN
61 021334 000167 177722      JMP    30#         ;RE-PRINT ANY PROMPTS
62 021340 105767 011032      40:  TSTB   DBFLG      ;IS "DEBUG" FLAG SET?
63 021344 001021              BNE     6#         ;YES, CHECK FOR OTHER FLAGS
64 021346 020027 000017      CMP    RO,#17     ;CNTRL-Q TYPED?
65 021352 001064              BNE     KRTN        ;NO, EXIT
66 021354 005767 011072      TST    PCONT      ;TEST IF ODT IS ALLOWED
67 021360 001404              BEQ    5#         ;YES, IF PCONT = 0 OR
68 021362 026727 011064 002376  CMP    PCONT,#PRMT4 ; IF GREATER THAN PRIORITY
69 021370 103407              BLO    6#         ; PROMPT.
70 021372 105767 011012      5:   TSTB   SAFE      ;ALSO, NOT WHILE IN FILL
   1 021376 001052              BNE     KRTN        ; COUNT ROUTINE.
   2 021400 062706 000006      ADD    #6,SP      ;BREAK ALL TIES WITH "INPKB"
73 021404 000167 175266      JMP    OOTPR      ;A-O.K. GO TO DEBUG-AID
74 021410 020027 000012      6:   CMP    RO,#12   ;CHECK FOR L.F.
75 021414 001007              BNE     7#         ;NOT A LINE FEED.
76 021416 012700 000015      MOV    #15,RO    ;CHANGE L.F. TO C.R.
77 021422 112767 177777 010752  MOVB  #-1,INCF   ;IT WAS, SET INCR FLAG
78 021430 000167 000070      JMP    KRTN       ;AND LEAVE
79 021434 020027 000057      7:   CMP    RO,#' /   ;WAS IT A SLASH?
80 021440 001007              BNE     8#         ;NO.
81 021442 112767 177777 010742  MOVB  #-1,SLFL   ;YES, SET SLASH FLAG
82 021450 004767 000446      JSR    PC,TTO     ;ECHO THE SLASH
83 021454 012716 021034      MOV    #NRTRN,(SP);AND EXIT.
84 021460 020027 000107      8:   CMP    RO,#'G   ;WAS "G" TYPED?
85 021464 001007              BNE     9#         ;NO.
86 021466 112767 177777 010704  MOVB  #-1,GOFLG  ;YES, SET "GO" FLAG
87 021474 004767 000422      JSR    PC,TTO     ;ECHO THE "G"
88 021500 012716 021034      MOV    #NRTRN,(SP);
89 021504 020027 000120      9:   CMP    RO,#'P   ;WAS "P" TYPED?
90 021510 001005              BNE     KRTN        ;NO, EXIT
91 021512 112767 177777 010654  MOVB  #-1,CONFLG ;YES, SET "CONTINUE" FLAG
92 021520 012716 021034      MOV    #NRTRN,(SP);
93 021524 000207      KRTN:  RTS      PC

```

;ASSOCIATED VARIABLE STORAGE:

```

98 021526 000000      NOKEFL: .WORD 0
99 021530 000000      KBBUF:  .WORD 0
100 021532 000010      FILL:   .WORD 10
101 021534 000000      FLCNT:  .WORD 0
102 021536 046      106      111      FILMSG: .ASCII /&FILL COUNT = 8/
   021541 114      114      040
   021544 103      117      125
   021547 116      124      040
   021552 075      040      100

```

103 .EVEN

CZCMLCO CHR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 34
 KEYBOARD INPUT ROUTINE

```

1          ;ROUTINE WHICH CHECKS AVAILABILITY OF THE PORT CONFIGURATION
2          ;STATUS THEN PRINTS THE STATUS, OR PRINTS
3          ;" ** STATUS NOT AVAILABLE **"
4
5 021556   105767   010613   PNTCNF: TSTB   CNFGFL       ;CHECK IF CONFIG IS AVAILABLE
6 021562   001404                   BEQ     PNTCO         ;IF NOT, SAY SO.
7 021564   004767   174070   JSR     PC,REPORT    ;IF SO, DUMP IT.
8 021570   000167   000010   JMP     PNTCX       ;AND LEAVE
9 021574                   PNTCO: PNTM   NOCNF         ;PRINT " ** STATUS NOT AVAILABLE **"
   021574   012700   023105   MOV     @NOCNF,RO   ;PRINT MESSAGE
   021600   004767   176752   JSR     PC,TYPOUT  ;POINTED TO BY NOCNF
10 021604   000207                   PNTCX: RTS     PC     ;RETURN
11

```

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 35
 BINARY TO ASCII CONVERSION ROUTINES

.SBTTL BINARY TO ASCII CONVERSION ROUTINES

```

1
2
3
4
5
6
7
8
9
10
11
12 021606
13 021606 004567 175542
14 021612 005067 000370
15 021616 012701 000010
16 021622 004767 000166
17 021626 004567 175536
18 021632 000207
19
20
21 021634
22 021634 004567 175514
23 021640 012767 177777 000340
24 021646 012701 000010
25 021652 004767 000136
26 021656 004567 175506
27 021662 000207
28
29
30 021664
31 021664 004567 175464
32 021670 005067 000312
33 021674 012701 000002
34 021700 004767 000110
35 021704 004567 175460
36 021710 000207
37
38
39 021712
40 021712 004567 175436
41 021716 005067 000264
42 021722 012701 000012
43 021726 004767 000062
44 021732 004567 175432
45 021736 000207
46
47
48 021740
   021740 004567 175410

```

```

;CONVERTS BINARY TO BINARY, BINARY TO
;OCTAL, AND BINARY TO DECIMAL, EITHER
;UNJUSTIFIED WITH LEADING ZERO'S SUPPRESSED
;OR RIGHT JUSTIFIED WITH LEADING 0'S
;SUPPRESSED

;REGILAR BIN-OCTAL UNJUSTIFIED:

OCTPNT: REGSAV
      JSR      R5,REGSAV
      CLR      RJFLG          ;CLEAR RIGHT JUSTIFY FLAG
      MOV      #10,R1        ;SET RADIX FOR OCTAL
      JSR      PC,NUMPNT     ;CONVERT & PRINT
      REGRES
      JSR      R5,REGRES
      RTS      PC            ;RETURN

;BIN-OCTAL JUSTIFIED:

OCTJSP: REGSAV
      JSR      R5,REGSAV
      MOV      #-1,RJFLG     ;SET RIGHT JUSTIFY FLAG
      MOV      #10,R1        ;SET RADIX FOR OCTAL
      JSR      PC,NUMPNT     ;CONVERT & PRINT
      REGRES
      JSR      R5,REGRES
      RTS      PC

;BIN-BIN

BINPNT: REGSAV
      JSR      R5,REGSAV
      CLR      RJFLG          ;CLEAR RIGHT JUSTIFY FLAG
      MOV      #2,R1         ;SET RADIX FOR BINARY
      JSR      PC,NUMPNT     ;CONVERT & PRINT
      REGRES
      JSR      R5,REGRES
      RTS      PC

;BIN-DECIMAL UNJUSTIFIED:

DECPNT: REGSAV
      JSR      R5,REGSAV
      CLR      RJFLG          ;CLEAR RIGHT JUSTIFY FLAG
      MOV      #12,R1        ;SET RADIX FOR DECIMAL
      JSR      PC,NUMPNT     ;CONVERT & PRINT
      REGRES
      JSR      R5,REGRES
      RTS      PC

;BIN-DECIMAL JUSTIFIED (6 PLACES)

DECJSP: REGSAV
      JSR      R5,REGSAV

```


CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 35-1
 BINARY TO ASCII CONVERSION ROUTINES

49	021744	012767	177777	000234		MOV	#-1,RJFLG		;SET RIGHT JUSTIFY FLAG	
50	021752	012701	000012			MOV	#12,R1		;SET RADIX FOR DECIMAL	
51	021756	004767	000032			JSR	PC,NUMPNT		;CONVERT & PRINT	
52	021762					REGRES				
		004567	175402			JSR	RS,REGRES			
53	021766	000207				RTS	PC			
54										
55										
56	021770	016767	177536	177536	NULLS:	MOV	FILL,FLCNT		;GET NO. OF FILL CHARS	;D.W 001
57	021776	005000				CLR	R0			
58	022000	004767	000116		1#:	JSR	PC,TTO			;D.W 001
59	022004	005367	177524			DEC	FLCNT		;DO # AS ORDERED	;D.W 001
60	022010	003373				BGT	1#			;D.W 001
61	022012	000207			NULOUT:	RTS	PC			

```

1          ;UNSIGNED CONVERT-PRINT ROUTINE (BIN - ASCII)
2
3 022014 010167 000170  NUMPNT: MOV    R1,RADIX      ;SAVE RADIX
4 022020 005002          CLR    R2          ;CLEAR TAB COUNTER
5 022022 005001          DIVSET: CLR   R1          ;CLEAR WORK REGISTER
6 022024 020067 000160  DIVID:  CMP    RO,RADIX      ;IS NUMBER BELOW RADIX?
7 022030 103404          BLO    GETDG          ;IF YES, STORE DIGIT
8 022032 166700 000152  SUB    RADIX,RO      ;ELSE, KEEP SUBTRACTING
9 022036 005201          INC    R1          ;AND KEEP COUNT
10 022040 000771          BR     DIVID
11 022042 010046          GETDG: MOV   RO,-(SP)      ;STACK REMAINDER
12 022044 010100          MOV    R1,RO
13 022046 001403          BEQ    PNTEXT        ;PRINT IF HIGHEST ORDER STACKED
14 022050 005202          INC    R2          ;ELSE COUNT DIGITS FOR R. JUSTIFY
15 022052 004767 177744  JSR    PC,DIVSET
16
17 022056 012703 000006  PNTEXT: MOV   #6,R3      ;GET DIGIT COUNT CONSTANT
18 022062 160203          SUB   R2,R3          ;HAVE WE PRODUCED 6 DIGITS?
19 022064 003413          BLE   PNT            ;YES, JUSTIFICATION UNNECESSARY
20 022066 005767 000114  TST   RJFLG          ;IS THE JUSTIFY FLAG SET?
21 022072 001410          BEQ   PNT            ;NO-DON'T JUSTIFY
22 022074 012700 000040  JUST:  MOV   #40,RO     ;YES, PRINT LEADING SPACES
23 022100 004767 000016  JSR   PC,TTO
24 022104 005303          DEC   R3
25 022106 001372          BNE   JUST
26 022110 005067 000072  CLR   RJFLG          ;CLEAR JUSTIFY FLG WHEN DONE
27 022114 012600          PNT:  MOV   (SP)+,RO    ;GET REST OF DIGITS OFF STACK
28 022116 052700 000060  BIS   #'0,RO        ;MAKE THEM ASCII
29
30          ;TYPE OUT ROUTINE
31          ;PRINTS A CHARACTER WHICH IS IN RO
32          ;IF THE CHARACTER IS "CR.", ALSO PRINT A "LF.".
33
34 022122 010077 010406  TTO:   MOV   RO,@TTB    ;PRINT CONTENTS OF RO
35 022126 105777 010404  TTOLP: TSTB  @TTS      ;WAIT TILL PRINT DONE
36 022132 100375          BPL   TTOLP
37 022134 022700 000015  CMP   #15,RO        ;WAS IT A CR?
38 022140 001401          BEQ   TTOLF         ;YES, ECHO A LF AS WELL
39 022142 000207          RTS   PC            ;NO, JUST RETURN
40 022144 012700 000012  TTOLF: MOV   #12,RO
41 022150 004767 177746          JSR   PC,TTO        ;ECHO A LINE FEED
42 022154 016767 177352 177352  MOV   FILL,FLCNT     ;PRINT NULLS FOR FILL
43 022162 012700 000000          MOV   #0,RO
44 022166 004767 177730 1#:   JSR   PC,TTO
45 022172 005367 177336          DEC   FLCNT
46 022176 003373          BGT   1#
47 022200 012700 000012  MOV   #12,RO        ;THEN RESTORE RO
48 022204 000207          RTS   PC            ;AND LEAVE
49
50
51          ;ASSOCIATED VARIABLE STORAGE:
52
53 022206 000000          RJFLG: .WORD 0
54 022210 000000          RADIX: .WORD 0
    
```

.SBTTL CONSTANTS, VARIABLES & ACSII

1
2
3
4
5
6

;ASCII MESSAGES:

022212	046	103	132	TSTHDR: .ASCII /&CZCMJCO CMR(V)-11 MOST EXERCISER 30-OCT-84/
022215	103	115	112	
022220	103	060	040	
022223	103	115	122	
022226	050	126	051	
022231	055	061	061	
022234	040	110	117	
022237	123	124	040	
022242	105	130	105	
022245	122	103	111	
022250	123	105	122	
022253	040	040	040	
022256	063	060	055	
022261	117	103	124	
022264	055	070	064	
7 022267	046	046	040	.ASCII /&& *** CAUTION ***/
022272	040	040	040	
022275	040	040	052	
022300	052	052	040	
022303	103	101	125	
022306	124	111	117	
022311	116	040	052	
022314	052	052		
8 022316	046	124	110	.ASCII /&THIS PROGRAM IS CAPABLE OF ALTERING THE STATE/
022321	111	123	040	
022324	120	122	117	
022327	107	122	101	
022332	115	040	111	
022335	123	040	103	
022340	101	120	101	
022343	102	114	105	
022346	040	117	106	
022351	040	101	114	
022354	124	105	122	
022357	111	116	107	
022362	040	124	110	
022365	105	040	123	
022370	124	101	124	
022373	105			
9 022374	046	117	106	.ASCII /&OF ANY FIELD EQUIPMENT ATTACHED TO ANY OF THE/
022377	040	101	116	
022402	131	040	106	
022405	111	105	114	
022410	104	040	105	
022413	121	125	111	
022416	120	115	105	
022421	116	124	040	
022424	101	124	124	
022427	101	103	110	
022432	105	104	040	
022435	124	117	040	
022440	101	116	131	

	022443	040	117	106	
	022446	040	124	110	
	022451	105			
10	022452	046	122	105	.ASCII /&REMOTES ON THIS CMR-11./
	022455	115	117	124	
	022460	105	123	040	
	022463	117	116	040	
	022466	124	110	111	
	022471	123	040	103	
	022474	115	122	055	
	022477	061	061	056	
11	022502	046	046	120	.ASCII /&&PROCEED WITH CAUTION IF FIELD HARDWARE IS STILL ON-LINE!&&@/
	022505	122	117	103	
	022510	105	105	104	
	022513	040	127	111	
	022516	124	110	040	
	022521	103	101	125	
	022524	124	111	117	
	022527	116	040	111	
	022532	106	040	106	
	022535	111	105	114	
	022540	104	040	110	
	022543	101	122	104	
	022546	127	101	122	
	022551	105	040	111	
	022554	123	040	123	
	022557	124	111	114	
	022562	114	040	117	
	022565	116	055	114	
	022570	111	116	105	
	022573	041	046	046	
	022576	100			
12	022577	046	111	116	FRAD: .ASCII /&INTERFACE ADDRESS: @/
	022602	124	105	122	
	022605	106	101	103	
	022610	105	040	101	
	022613	104	104	122	
	022616	105	123	123	
	022621	072	040	100	
13	022624	046	124	110	AGAIN: .ASCII /&THAT WON'T DO. TRY AGAIN&@/
	022627	101	124	040	
	022632	127	117	116	
	022635	047	124	040	
	022640	104	117	056	
	022643	040	124	122	
	022646	131	040	101	
	022651	107	101	111	
	022654	116	046	100	
14	022657	046	111	116	DVECT: .ASCII /&INTERFACE VECTOR: @/
	022662	124	105	122	
	022665	106	101	103	
	022670	105	040	126	
	022673	105	103	124	
	022676	117	122	072	
	022701	040	100		
15	022703	046	111	116	DVPRI: .ASCII /&INTERFACE PRIORITY (4 TO 7): @/
	022706	124	105	122	

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-2
 CONSTANTS, VARIABLES & ACSII

	022711	106	101	103	
	022714	105	040	120	
	022717	122	111	117	
	022722	122	111	124	
	022725	131	040	050	
	022730	064	040	124	
	022733	117	040	067	
	022736	051	072	040	
	022741	100			
16	022742	046	103	115	DBAID: .ASCII /&CMR-11 DE-BUG AID&&@/
	022745	122	055	061	
	022750	061	040	104	
	022753	105	055	102	
	022756	125	107	040	
	022761	101	111	104	
	022764	046	046	100	
17	022767	046	111	116	INVLAD: .ASCII /&INVALID ADDRESS...(IT'S NOT THERE)@/
	022772	126	101	114	
	022775	111	104	040	
	023000	101	104	104	
	023003	122	105	123	
	023006	123	056	056	
	023011	056	050	111	
	023014	124	047	123	
	023017	040	116	117	
	023022	124	040	124	
	023025	110	105	122	
	023030	105	051	100	
18	023033	046	046	124	TRP4: .ASCII /&&TRAPPED TO 4 FROM LOCATION @/
	023036	122	101	120	
	023041	120	105	104	
	023044	040	124	117	
	023047	040	064	040	
	023052	106	122	117	
	023055	115	040	114	
	023060	117	103	101	
	023063	124	111	117	
	023066	116	040	100	
19	023071	040	040	072	TWOSP: .ASCII / :@/
	023074	100			
20	023075	046	123	127	SWRMSG: .ASCII /&SWR = @/
	023100	122	040	075	
	023103	040	100		
21	023105	046	052	052	NOCNF: .ASCII /&** CONFIGURATION NOT AVAILABLE **&@/
	023110	040	103	117	
	023113	116	106	111	
	023116	107	125	122	
	023121	101	124	111	
	023124	117	116	040	
	023127	116	117	124	
	023132	040	101	126	
	023135	101	111	114	
	023140	101	102	114	
	023143	105	040	052	
	023146	052	046	100	
22	023151	046	124	131	TYPCTP: .ASCII /&TYPE "P" TO CONTINUE@/
	023154	120	105	040	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-3
 CONSTANTS, VARIABLES & ACSII

	023157	042	120	042	
	023162	040	124	117	
	023165	040	103	117	
	023170	116	124	111	
	023173	116	125	105	
	023176	100			
23	023177	046	123	105	TSTSEL: .ASCII /ESELECT TEST (4=HELP) @/
	023202	114	105	103	
	023205	124	040	124	
	023210	105	123	124	
	023213	040	050	064	
	023216	075	110	105	
	023221	114	120	051	
	023224	040	100		
24	023226	046	123	105	HELPM: .ASCII /ESELECT ONE OF THE FOLLOWING: &/
	023231	114	105	103	
	023234	124	040	117	
	023237	116	105	040	
	023242	117	106	040	
	023245	124	110	105	
	023250	040	106	117	
	023253	114	114	117	
	023256	127	111	116	
	023261	107	072	046	
25	023264	046	074	103	.ASCII /E<CR> OR 1 = LOGIC TEST/
	023267	122	076	040	
	023272	117	122	040	
	023275	061	040	075	
	023300	040	114	117	
	023303	107	111	103	
	023306	040	124	105	
	023311	123	124		
26	023313	046	040	040	.ASCII /E 2 = PORT LOOP-BACK TEST/
	023316	040	040	040	
	023321	040	040	040	
	023324	062	040	075	
	023327	040	120	117	
	023332	122	124	040	
	023335	114	117	117	
	023340	120	055	102	
	023343	101	103	113	
	023346	040	124	105	
	023351	123	124		
27	023353	046	040	040	.ASCII /E 3 = CMR-11 EXERCISER/
	023356	040	040	040	
	023361	040	040	040	
	023364	063	040	075	
	023367	040	103	115	
	023372	122	055	061	
	023375	061	040	105	
	023400	130	105	122	
	023403	103	111	123	
	023406	105	122		
28	023410	046	040	040	.ASCII /E 4 = THIS HELP INFO./
	023413	040	040	040	
	023416	040	040	040	
	023421	064	040	075	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-4
 CONSTANTS, VARIABLES & ACSII

	023424	040	124	110	
	023427	111	123	040	
	023432	110	105	114	
	023435	120	040	111	
	023440	116	106	117	
	023443	056			
29	023444	046	040	040	.ASCII /E CNTRL-C = TEST SELECT/
	023447	103	116	124	
	023452	122	114	055	
	023455	103	040	075	
	023460	040	124	105	
	023463	123	124	040	
	023466	123	105	114	
	023471	105	103	124	
30	023474	046	040	040	.ASCII /E CNTRL-G = SWITCH OPTION SELECT/
	023477	103	116	124	
	023502	122	114	055	
	023505	107	040	075	
	023510	040	123	127	
	023513	111	124	103	
	023516	110	040	117	
	023521	120	124	111	
	023524	117	116	040	
	023527	123	105	114	
	023532	105	103	124	
31	023535	046	040	040	.ASCII /E CNTRL-F = CONSOLE FILL COUNT SELECT/
	023540	103	116	124	
	023543	122	114	055	
	023546	106	040	075	
	023551	040	103	117	
	023554	116	123	117	
	023557	114	105	040	
	023562	106	111	114	
	023565	114	040	103	
	023570	117	125	116	
	023573	124	040	123	
	023576	105	114	105	
	023601	103	124		
32	023603	046	040	040	.ASCII /E CNTRL-A = SHOW PORT CONFIG. STATUS/
	023606	103	116	124	
	023611	122	114	055	
	023614	101	040	075	
	023617	040	123	110	
	023622	117	127	040	
	023625	120	117	122	
	023630	124	040	103	
	023633	117	116	106	
	023636	111	107	056	
	023641	040	123	124	
	023644	101	124	125	
	023647	123			
33	023650	046	040	040	.ASCII /E (ONLY WORKS IF TABLE ALREADY/
	023653	040	040	040	
	023656	040	040	040	
	023661	040	040	040	
	023664	040	050	117	
	023667	116	114	131	

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-5
 CONSTANTS, VARIABLES & ACSII

	023672	040	127	117		
	023675	122	113	123		
	023700	040	111	106		
	023703	040	124	101		
	023706	102	114	105		
	023711	040	101	114		
	023714	122	105	101		
	023717	104	131			
34	023721	046	040	040	.ASCII /E	PRINTED AUTOMATICALLY)./
	023724	040	040	040		
	023727	040	040	040		
	023732	040	040	040		
	023735	040	120	122		
	023740	111	116	124		
	023743	105	104	040		
	023746	101	125	124		
	023751	117	115	101		
	023754	124	111	103		
	023757	101	114	114		
	023762	131	051	056		
35	023765	046	040	040	.ASCII /E	CNTRL-O = DEBUG ROUTINE WHICH ALLOWS/
	023770	103	116	124		
	023773	122	114	055		
	023776	117	040	075		
	024001	040	104	105		
	024004	102	125	107		
	024007	040	122	117		
	024012	125	124	111		
	024015	116	105	040		
	024020	127	110	111		
	024023	103	110	040		
	024026	101	114	114		
	024031	117	127	123		
36	024034	046	040	040	.ASCII /E	LOADING SCR. PAD AND STARTING/
	024037	040	040	040		
	024042	040	040	040		
	024045	040	040	040		
	024050	040	114	117		
	024053	101	104	111		
	024056	116	107	040		
	024061	123	103	122		
	024064	056	040	120		
	024067	101	104	040		
	024072	101	116	104		
	024075	040	123	124		
	024100	101	122	124		
	024103	111	116	107		
37	024106	046	040	040	.ASCII /E	FUNCTIONS AND EXAMINING THE/
	024111	040	040	040		
	024114	040	040	040		
	024117	040	040	040		
	024122	040	106	125		
	024125	116	103	124		
	024130	111	117	116		
	024133	123	040	101		
	024136	116	104	040		
	024141	105	130	101		

CZCMLCO CMB(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-6
 CONSTANTS, VARIABLES & ASCII

	024144	115	111	116		
	024147	111	116	107		
	024152	040	124	110		
	024155	105				
38	024156	046	040	040	.ASCII /E	RESULTS/
	024161	040	040	040		
	024164	040	040	040		
	024167	040	040	040		
	024172	040	122	105		
	024175	123	125	114		
	024200	124	123			
39	024202	046	040	040	.ASCII /E	"P" = PROCEED FROM SW. MONITOR B/
	024205	040	040	040		
	024210	040	042	120		
	024213	042	040	075		
	024216	040	120	122		
	024221	117	103	105		
	024224	105	104	040		
	024227	106	122	117		
	024232	115	040	123		
	024235	127	056	040		
	024240	115	117	116		
	024243	111	124	117		
	024246	122	040	040		
	024251	040	100			
40	024253	046	111	106	MLPDSR: .ASCII /E	IF HELP IS REQUIRED, ENTER A "4" B/
	024256	040	110	105		
	024261	114	120	040		
	024264	111	123	040		
	024267	122	105	121		
	024272	125	111	122		
	024275	105	104	054		
	024300	040	105	116		
	024303	124	105	122		
	024306	040	101	040		
	024311	042	064	042		
	024314	040	040	040		
	024317	100				
41	024320	046	114	117	LGKTSR: .ASCII /E	LOGIC TEST&B/
	024323	107	111	103		
	024326	040	124	105		
	024331	123	124	046		
	024334	100				
42	024335	046	104	111	BRKCOM: .ASCII /E	DISCONNECT COMMUNICATIONS TO ALL REMOTES..&B/
	024340	123	103	117		
	024343	116	116	105		
	024346	103	124	040		
	024351	103	117	115		
	024354	115	125	116		
	024357	111	103	101		
	024362	124	111	117		
	024365	116	123	040		
	024370	124	117	040		
	024373	101	114	114		
	024376	040	122	105		
	024401	115	117	124		
	024404	105	123	056		

	024407	056	046	100	
43	024412	046	122	105	RECON: .ASCII /ERE-CONNECT COMMUNICATIONS TO REMOTES..&/
	024415	055	103	117	
	024420	116	116	105	
	024423	103	124	040	
	024426	103	117	115	
	024431	115	125	116	
	024434	111	103	101	
	024437	124	111	117	
	024442	116	123	040	
	024445	124	117	040	
	024450	122	105	115	
	024453	117	124	105	
	024456	123	056	056	
	024461	046	100		
44	024463	046	123	103	SCPAD: .ASCII /ESCR.PAD ADDR = &/
	024466	122	056	120	
	024471	101	104	040	
	024474	101	104	104	
	024477	122	040	075	
	024502	040	100		
45	024504	046	046	110	VERSM: .ASCII /&HOST FIRMWARE VERSION : &/
	024507	117	123	124	
	024512	040	106	111	
	024515	122	115	127	
	024520	101	122	105	
	024523	040	126	105	
	024526	122	123	111	
	024531	117	116	040	
	024534	072	040	100	
46	024537	046	046	102	BAUDM: .ASCII /&BAUD RATES:&/
	024542	101	125	104	
	024545	040	122	101	
	024550	124	105	123	
	024553	072	100		
47	024555	046	120	117	PORT0M: .ASCII /&PORT #0 = &/
	024560	122	124	040	
	024563	043	060	040	
	024566	075	040	100	
48	024571	046	120	117	PORT1M: .ASCII /&PORT #1 = &/
	024574	122	124	040	
	024577	043	061	040	
	024602	075	040	100	
49	024605	046	120	117	PORT2M: .ASCII /&PORT #2 = &/
	024610	122	124	040	
	024613	043	062	040	
	024616	075	040	100	
50	024621	046	120	117	PORT3M: .ASCII /&PORT #3 = &/
	024624	122	124	040	
	024627	043	063	040	
	024632	075	040	100	
51	024635	046	105	116	ENDPS: .ASCII /&END PASS #&/
	024640	104	040	120	
	024643	101	123	123	
	024646	040	043	100	
52	024651	040	105	114	ELTIM: .ASCII / EL. TIM.=&/
	024654	056	040	124	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-8
 CONSTANTS, VARIABLES & ASCII

	024657	111	115	056	
	024662	075	100		
53	024664	040	040	105	ERCTM: .ASCII / ERR. CNT = 8/
	024667	122	122	056	
	024672	040	103	116	
	024675	124	040	075	
	024700	040	100		
54	024702	052	052	117	OVFLM: .ASCII /**OVERFLOW**8/
	024705	126	105	122	
	024710	106	114	117	
	024713	127	052	052	
	024716	100			
55	024717	046	120	117	PLTM: .ASCII /EPORT LOOP-BACK TEST&8/
	024722	122	124	040	
	024725	114	117	117	
	024730	120	055	102	
	024733	101	103	113	
	024736	040	124	105	
	024741	123	124	046	
	024744	100			
56	024745	046	124	131	PORTN: .ASCII /EYPE PORT # (<CR>=ALL): 8/
	024750	120	105	040	
	024753	120	117	122	
	024756	124	040	043	
	024761	040	050	074	
	024764	103	122	076	
	024767	075	101	114	
	024772	114	051	072	
	024775	040	100		
57	024777	046	124	131	TYPGR: .ASCII /EYPE <CR> WHEN READY: 8/
	025002	120	105	040	
	025005	074	103	122	
	025010	076	040	127	
	025013	110	105	116	
	025016	040	122	105	
	025021	101	104	131	
	025024	072	040	100	
58	025027	046	103	115	EXCM: .ASCII /&CMR EXERCISE ROUTINE&8/
	025032	122	040	105	
	025035	130	105	122	
	025040	103	111	123	
	025043	105	040	122	
	025046	117	125	124	
	025051	111	116	105	
	025054	046	100		
59	025056	046	050	107	SLOW: .ASCII /&(GIVE ME A FEW MINUTES ALONE WITH THE REMOTES)&8/
	025061	111	126	105	
	025064	040	115	105	
	025067	040	101	040	
	025072	106	105	127	
	025075	040	115	111	
	025100	116	125	124	
	025103	105	123	040	
	025106	101	114	117	
	025111	116	105	040	
	025114	127	111	124	
	025117	110	040	124	

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-9
 CONSTANTS, VARIABLES & ACSII

	025122	110	105	040	
	025125	122	105	115	
	025130	117	124	105	
	025133	123	051	046	
	025136	100			
60	025137	046	052	052	NOREM: .ASCII /&*** NO REMOTES ON MOST ***&/
	025142	052	040	116	
	025145	117	040	122	
	025150	105	115	117	
	025153	124	105	123	
	025156	040	117	116	
	025161	040	110	117	
	025164	123	124	040	
	025167	052	052	052	
	025172	046			
61	025173	046	050	040	.ASCII /&(I WILL KEEP LOOKING FOR ANY CHANGES)&/
	025176	111	040	127	
	025201	111	114	114	
	025204	040	113	105	
	025207	105	120	040	
	025212	114	117	117	
	025215	113	111	116	
	025220	107	040	106	
	025223	117	122	040	
	025226	101	116	131	
	025231	040	103	110	
	025234	101	116	107	
	025237	105	123	040	
	025242	051	046	100	
62	025245	046	120	117	PORTMS: .ASCII /&PORT #&/
	025250	122	124	040	
	025253	043	100		
63	025255	046	122	105	REMSG: .ASCII /&REMOTE #&/
	025260	115	117	124	
	025263	105	040	043	
	025266	100			
64	025267	046	040	052	CONFMS: .ASCII /& ** PORT CONFIGURATION **&/
	025272	052	040	120	
	025275	117	122	124	
	025300	040	103	117	
	025303	116	106	111	
	025306	107	125	122	
	025311	101	124	111	
	025314	117	116	040	
	025317	052	052	046	
	025322	100			
65	025323	046	123	124	STATEM: .ASCII /&STATE = #&/
	025326	101	124	105	
	025331	040	075	040	
	025334	100			
66	025335	046	125	123	USORM: .ASCII /&USOR = #&/
	025340	117	122	040	
	025343	075	040	100	
67	025346	046	103	117	COMST: .ASCII /&COMM STATUS = #&/
	025351	115	115	040	
	025354	123	124	101	
	025357	124	125	123	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-10
 CONSTANTS, VARIABLES & ACSII

	025362	040	075	040	
	025365	100			
68	025366	046	052	052	REMCHG: .ASCII /&*** REMOTE STATUS CHANGE ***&/
	025371	052	040	122	
	025374	105	115	117	
	025377	124	105	040	
	025402	123	124	101	
	025405	124	125	123	
	025410	040	103	110	
	025413	101	116	107	
	025416	105	040	052	
	025421	052	052	100	
69	025424	046	122	105	REMSTM: .ASCII /&REMOTE STATUS NOW &/
	025427	115	117	124	
	025432	105	040	123	
	025435	124	101	124	
	025440	125	123	040	
	025443	116	117	127	
	025446	040	100		
70	025450	040	122	105	REGMG: .ASCII / REGULAR&/
	025453	107	125	114	
	025456	101	122	100	
71	025461	040	111	122	IRRGMG: .ASCII / IRREGULAR&/
	025464	122	105	107	
	025467	125	114	101	
	025472	122	100		
72	025474	046	052	052	ALROFF: .ASCII /&*** NO REGULAR REMOTES FOUND ***&/
	025477	052	040	116	
	025502	117	040	122	
	025505	105	107	125	
	025510	114	101	122	
	025513	040	122	105	
	025516	115	117	124	
	025521	105	123	040	
	025524	106	117	125	
	025527	116	104	040	
	025532	052	052	052	
	025535	046	100		
73	025537	046	046	104	DTLGN: .ASCII /&&DETAILED(1) OR GENERAL(0)...(0) &/
	025542	105	124	101	
	025545	111	114	105	
	025550	104	050	061	
	025553	051	040	117	
	025556	122	040	107	
	025561	105	116	105	
	025564	122	101	114	
	025567	050	060	051	
	025572	056	056	056	
	025575	133	060	135	
	025600	040	100		
74	025602	046	124	131	GTREM: .ASCII "&TYPE PORT/REMOTE #'S (400=HELP, <CR>=END)&&"
	025605	120	105	040	
	025610	120	117	122	
	025613	124	057	122	
	025616	105	115	117	
	025621	124	105	040	
	025624	043	047	123	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-11
 CONSTANTS, VARIABLES & ACSII

	025627	040	050	064	
	025632	060	060	075	
	025635	110	105	114	
	025640	120	054	040	
	025643	074	103	122	
	025646	076	075	105	
	025651	116	104	051	
	025654	046	046	100	
75	025657	040	040	122	RMNB: .ASCII / REM # 8/
	025662	105	115	040	
	025665	043	040	100	
76	025670	046	046	040	GRMLP: .ASCII /&& PORT # AND REMOTE # ARE COMBINED INTO /
	025673	040	120	117	
	025676	122	124	040	
	025701	043	040	101	
	025704	116	104	040	
	025707	122	105	115	
	025712	117	124	105	
	025715	040	043	040	
	025720	101	122	105	
	025723	040	103	117	
	025726	115	102	111	
	025731	116	105	104	
	025734	040	111	116	
	025737	124	117	040	
77	025742	117	116	105	.ASCII /ONE OCTAL NUMBER./
	025745	040	117	103	
	025750	124	101	114	
	025753	040	116	125	
	025756	115	102	105	
78	025761	122	056		
	025763	046	046	040	.ASCII /&& HUNDREDS DIGIT = PORT NUMBER (0 TO 3)&/
	025766	040	040	040	
	025771	040	110	125	
	025774	116	104	122	
	025777	105	104	123	
	026002	040	104	111	
	026005	107	111	124	
	026010	040	075	040	
	026013	120	117	122	
	026016	124	040	116	
	026021	125	115	102	
	026024	105	122	040	
	026027	050	060	040	
	026032	124	117	040	
	026035	063	051	046	
79	026040	040	040	040	.ASCII / TENS AND ONES = REMOTE NUMBER (0 TO 76)/
	026043	040	040	124	
	026046	105	116	123	
	026051	040	101	116	
	026054	104	040	117	
	026057	116	105	123	
	026062	040	040	040	
	026065	075	040	122	
	026070	105	115	117	
	026073	124	105	040	
	026076	116	125	115	

	026101	102	105	122	
	026104	040	050	060	
	026107	040	124	117	
	026112	040	067	066	
	026115	051			
80	026116	046	124	131	.ASCII /&TYPE <CR> ALONE TO END INPUT/
	026121	120	105	040	
	026124	074	103	122	
	026127	076	040	101	
	026132	114	117	116	
	026135	105	040	124	
	026140	117	040	105	
	026143	116	104	040	
	026146	111	116	120	
	026151	125	124		
81	026153	046	046	105	.ASCII /&&EXAMPLES:/
	026156	130	101	115	
	026161	120	114	105	
	026164	123	072		
82	026166	046	106	117	.ASCII /&FOR PORT# AND REMOTE# YOU TYPE/
	026171	122	040	120	
	026174	117	122	124	
	026177	043	040	040	
	026202	101	116	104	
	026205	040	122	105	
	026210	115	117	124	
	026213	105	043	040	
	026216	040	131	117	
	026221	125	040	124	
	026224	131	120	105	
83	026227	046	046	040	.ASCII /&& 0 0 0<CR>/
	026232	040	040	040	
	026235	060	040	040	
	026240	040	040	040	
	026243	040	040	040	
	026246	040	040	040	
	026251	060	040	040	
	026254	040	040	040	
	026257	040	040	040	
	026262	040	040	060	
	026265	074	103	122	
	026270	076			
84	026271	046	040	040	.ASCII /& 0 3 3<CR>/
	026274	040	040	060	
	026277	040	040	040	
	026302	040	040	040	
	026305	040	040	040	
	026310	040	040	063	
	026313	040	040	040	
	026316	040	040	040	
	026321	040	040	040	
	026324	040	063	074	
	026327	103	122	076	
85	026332	046	040	040	.ASCII /& 1 36 136<CR>/
	026335	040	040	061	
	026340	040	040	040	
	026343	040	040	040	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 37-13
 CONSTANTS, VARIABLES & ACSII

	026346	040	040	040				
	026351	040	063	066				
	026354	040	040	040				
	026357	040	040	040				
	026362	040	040	061				
	026365	063	066	074				
	026370	103	122	076				
86	026373	046	040	040	.ASCII	/E	3	3 303<CR>/
	026376	040	040	063				
	026401	040	040	040				
	026404	040	040	040				
	026407	040	040	040				
	026412	040	040	063				
	026415	040	040	040				
	026420	040	040	040				
	026423	040	040	063				
	026426	060	063	074				
	026431	103	122	076				
87	026434	046	040	040	.ASCII	/E	TO BEGIN TESTING	<CR>E8/
	026437	040	124	117				
	026442	040	102	105				
	026445	107	111	116				
	026450	040	124	105				
	026453	123	124	111				
	026456	116	107	040				
	026461	040	040	040				
	026464	040	040	040				
	026467	040	040	074				
	026472	103	122	076				
88	026475	046	100					

				;	ERROR MESSAGES
1					
2					
3	026477	040	110	117	NOGO: .ASCII / HOST MICRO FAILED TO START.0/
	026502	123	124	040	
	026505	115	111	103	
	026510	122	117	040	
	026513	106	101	111	
	026516	114	105	104	
	026521	040	124	117	
	026524	040	123	124	
	026527	101	122	124	
	026532	056	100		
4	026534	040	120	127	NOTUP: .ASCII / PWR-UP SEQUENCE NOT COMPLETE.(BAD CSR).0/
	026537	122	055	125	
	026542	120	040	123	
	026545	105	121	125	
	026550	105	116	103	
	026553	105	040	116	
	026556	117	124	040	
	026561	103	117	115	
	026564	120	114	105	
	026567	124	105	056	
	026572	050	102	101	
	026575	104	040	103	
	026600	123	122	051	
	026603	056	100		
5	026605	040	103	123	CSRRST: .ASCII / CSR REG. NOT RESET.0/
	026610	122	040	122	
	026613	105	107	056	
	026616	040	116	117	
	026621	124	040	122	
	026624	105	123	105	
	026627	124	056	100	
6	026632	040	103	101	SPRCLR: .ASCII / CAN'T CLR SPAR REG.0/
	026635	116	047	124	
	026640	040	103	114	
	026643	122	040	123	
	026646	120	101	122	
	026651	040	122	105	
	026654	107	056	100	
7	026657	040	102	101	SPRDAT: .ASCII / BAD DATA IN SPAR REG.0/
	026662	104	040	104	
	026665	101	124	101	
	026670	040	111	116	
	026673	040	123	120	
	026676	101	122	040	
	026701	122	105	107	
	026704	056	100		
8	026706	040	122	105	ISATE: .ASCII / REQ SCPD ADR TST ERROR.0/
	026711	121	040	123	
	026714	103	120	104	
	026717	040	101	104	
	026722	122	040	124	
	026725	123	124	040	
	026730	105	122	122	
	026733	117	122	056	
	026736	100			

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 38-1
 CONSTANTS, VARIABLES & ACSII

9	026737	040	122	105	OSDTE: .ASCII / RESULT SCPD DATA TST ERROR.0/
	026742	123	125	114	
	026745	124	040	123	
	026750	103	120	104	
	026753	040	104	101	
	026756	124	101	040	
	026761	124	123	124	
	026764	040	105	122	
	026767	122	117	122	
	026772	056	100		
10	026774	040	122	105	OSATE: .ASCII / RESULT SCPD ADR TST ERROR.0/
	026777	123	125	114	
	027002	124	040	123	
	027005	103	120	104	
	027010	040	101	104	
	027013	122	040	124	
	027016	123	124	040	
	027021	105	122	122	
	027024	117	122	056	
	027027	100			
11	027030	040	122	105	ISDTE: .ASCII / REQ SCPD DATA TST ERROR.0/
	027033	121	040	123	
	027036	103	120	104	
	027041	040	104	101	
	027044	124	101	040	
	027047	124	123	124	
	027052	040	105	122	
	027055	122	117	122	
	027060	056	100		
12	027062	040	122	105	RQSPCL: .ASCII / REQ. SCPD NOT ALL 0'S.0/
	027065	121	056	040	
	027070	123	103	120	
	027073	104	040	116	
	027076	117	124	040	
	027101	101	114	114	
	027104	040	060	047	
	027107	123	056	100	
13	027112	040	122	105	RSSPCL: .ASCII / RES. SCPD NOT ALL 0'S.0/
	027115	123	056	040	
	027120	123	103	120	
	027123	104	040	116	
	027126	117	124	040	
	027131	101	114	114	
	027134	040	060	047	
	027137	123	056	100	
14	027142	040	042	103	CLTBER: .ASCII / "CLRTPB" FAILED TO CLR TOP BYTE.0/
	027145	114	122	124	
	027150	120	102	042	
	027153	040	106	101	
	027156	111	114	105	
	027161	104	040	124	
	027164	117	040	103	
	027167	114	122	040	
	027172	124	117	120	
	027175	040	102	131	
	027200	124	105	056	
	027203	100			

CZCMJCO CHR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 38-2
 CONSTANTS, VARIABLES & ACSII

15	027204	040	127	122	DIERR: .ASCII / WRONG CSR FOR "DIE" FUNC.0/
	027207	117	116	107	
	027212	040	103	123	
	027215	122	040	106	
	027220	117	122	040	
	027223	042	104	111	
	027226	105	042	040	
	027231	106	125	116	
	027234	103	056	100	
16	027237	040	102	101	CSRWE: .ASCII / BAD CSR BITS WHILE HUNG.0/
	027242	104	040	103	
	027245	123	122	040	
	027250	102	111	124	
	027253	123	040	127	
	027256	110	111	114	
	027261	105	040	110	
	027264	125	116	107	
	027267	056	100		
17	027271	040	103	101	CSRCE: .ASCII / CAN'T CLR LOW CSR WHILE HUNG.0/
	027274	116	047	124	
	027277	040	103	114	
	027302	122	040	114	
	027305	117	127	040	
	027310	103	123	122	
	027313	040	127	110	
	027316	111	114	105	
	027321	040	110	125	
	027324	116	107	056	
	027327	100			
18	027330	040	101	103	SPAVME: .ASCII / ACCESSED REQ SCPD WITH "MAIN" SET.0/
	027333	103	105	123	
	027336	123	105	104	
	027341	040	122	105	
	027344	121	040	123	
	027347	103	120	104	
	027352	040	127	111	
	027355	124	110	040	
	027360	042	115	101	
	027363	111	116	042	
	027366	040	123	105	
	027371	124	056	100	
19	027374	040	101	103	SPAVFE: .ASCII / ACCESSED REQ SCPD WITH "STFUN" SET.0/
	027377	103	105	123	
	027402	123	105	104	
	027405	040	122	105	
	027410	121	040	123	
	027413	103	120	104	
	027416	040	127	111	
	027421	124	110	040	
	027424	042	123	124	
	027427	106	125	116	
	027432	042	040	123	
	027435	105	124	056	
	027440	100			
20	027441	040	110	117	NOINTR: .ASCII / HOST CAN'T INTERRUPT UNIBUS.0/
	027444	123	124	040	
	027447	103	101	116	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 38-3
 CONSTANTS, VARIABLES & ACSII

	027452	047	124	040	
	027455	111	116	124	
	027460	105	122	122	
	027463	125	120	124	
	027466	040	125	116	
	027471	111	102	125	
	027474	123	056	100	
21	027477	040	105	122	ERINTR: .ASCII / ERRONEOUS MOST INTERRUPT.0/
	027502	122	117	116	
	027505	105	117	125	
	027510	123	040	110	
	027513	117	123	124	
	027516	040	111	116	
	027521	124	105	122	
	027524	122	125	120	
	027527	124	056	100	
22	027532	040	127	122	WPODI: .ASCII / WRONG PRIORITY. DEV. IS HIGHER.0/
	027535	117	116	107	
	027540	040	120	122	
	027543	111	117	122	
	027546	111	124	131	
	027551	056	040	104	
	027554	105	126	056	
	027557	040	111	123	
	027562	040	110	111	
	027565	107	110	105	
	027570	122	056	100	
23	027573	040	120	122	HITER: .ASCII / PROG INIT. FAILED TO INIT CSR.0/
	027576	117	107	040	
	027601	111	116	111	
	027604	124	056	040	
	027607	106	101	111	
	027612	114	105	104	
	027615	040	124	117	
	027620	040	111	116	
	027623	111	124	040	
	027626	103	123	122	
	027631	056	100		
24	027633	040	115	111	VISF: .ASCII / MICRO DIDN'T STORE VERSION NO.0/
	027636	103	122	117	
	027641	040	104	111	
	027644	104	116	047	
	027647	124	040	123	
	027652	124	117	122	
	027655	105	040	126	
	027660	105	122	123	
	027663	111	117	116	
	027666	040	116	117	
	027671	056	100		
25	027673	040	062	116	VIDER: .ASCII / 2ND VERSION INFO DIFFERS FROM PWR-UP.0/
	027676	104	040	126	
	027701	105	122	123	
	027704	111	117	116	
	027707	040	111	116	
	027712	106	117	040	
	027715	104	111	106	
	027720	106	105	122	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 38-4
 CONSTANTS, VARIABLES & ACSII

	027723	123	040	106	
	027726	122	117	115	
	027731	040	120	127	
	027734	122	055	125	
	027737	120	056	100	
26	027742	040	101	103	SPAVIC: .ASCII / ACCESSED RES. SCPD WITH INTR CLR. @/
	027745	103	105	123	
	027750	123	105	104	
	027753	040	122	105	
	027756	123	056	040	
	027761	123	103	120	
	027764	104	040	127	
	027767	111	124	110	
	027772	040	111	116	
	027775	124	122	040	
	030000	103	114	122	
	030003	056	100		
27	030005	040	127	122	STESTF: .ASCII / WRONG CSR WITH "STFUN" .@/
	030010	117	116	107	
	030013	040	103	123	
	030016	122	040	127	
	030021	111	124	110	
	030024	040	042	123	
	030027	124	106	125	
	030032	116	042	056	
	030035	100			
28	030036	040	042	115	RSPEF: .ASCII / "MAIN" RESULT FUNC. CODE WRONG. @/
	030041	101	111	116	
	030044	042	040	122	
	030047	105	123	125	
	030052	114	124	040	
	030055	106	125	116	
	030060	103	056	040	
	030063	103	117	104	
	030066	105	040	127	
	030071	122	117	116	
	030074	107	056	100	
29	030077	040	102	101	USOFE1: .ASCII / BAD USOF FROM "STFUN" ON MAINT. @/
	030102	104	040	125	
	030105	123	117	106	
	030110	040	106	122	
	030113	117	115	040	
	030116	042	123	124	
	030121	106	125	116	
	030124	042	040	117	
	030127	116	040	115	
	030132	101	111	116	
	030135	124	056	100	
30	030140	040	127	122	STEMF: .ASCII / WRONG CSR WITH "MAINT" .@/
	030143	117	116	107	
	030146	040	103	123	
	030151	122	040	127	
	030154	111	124	110	
	030157	040	042	115	
	030162	101	111	116	
	030165	124	042	056	
	030170	100			

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 38 5
 CONSTANTS, VARIABLES & ACSII

31	030171	040	102	101	USOFE2: .ASCII / BAD USOF FROM "MAINT" FUNC.0/
	030174	104	040	125	
	030177	123	117	106	
	030202	040	106	122	
	030205	117	115	040	
	030210	042	115	101	
	030213	111	116	124	
	030216	042	040	106	
	030221	125	116	103	
	030224	056	100		
32	030226	040	042	115	DATLER: .ASCII / "MAIN" FUNC GAVE BAD DATA LEN.0/
	030231	101	111	116	
	030234	042	040	106	
	030237	125	116	103	
	030242	040	107	101	
	030245	126	105	040	
	030250	102	101	104	
	030253	040	104	101	
	030256	124	101	040	
	030261	114	105	116	
	030264	056	100		
33	030266	040	122	105	RSPENF: .ASCII / RES. FUNC CODE WRONG FOR "MAIN".0/
	030271	123	056	040	
	030274	106	125	116	
	030277	103	040	103	
	030302	117	104	105	
	030305	040	127	122	
	030310	117	116	107	
	030313	040	106	117	
	030316	122	040	042	
	030321	115	101	111	
	030324	116	042	056	
	030327	100			
34	030330	040	102	101	USOFE3: .ASCII / BAD USOF FROM "MAIN" ON REG FUNC.0/
	030333	104	040	125	
	030336	123	117	106	
	030341	040	106	122	
	030344	117	115	040	
	030347	042	115	101	
	030352	111	116	042	
	030355	040	117	116	
	030360	040	122	105	
	030363	107	040	106	
	030366	125	116	103	
	030371	056	100		
35	030373	040	127	122	USOFE4: .ASCII / WRONG USOF ON REGULAR FUNC.0/
	030376	117	116	107	
	030401	040	125	123	
	030404	117	106	040	
	030407	117	116	040	
	030412	122	105	107	
	030415	125	114	101	
	030420	122	040	106	
	030423	125	116	103	
	030426	056	100		
36	030430	040	124	117	PLFFE: .ASCII / TOTAL FAILURE ON "MAIN" FUNCTION.0/
	030433	124	101	114	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 38 6
 CONSTANTS, VARIABLES & ASCII

	030436	040	106	101	
	030441	111	114	125	
	030444	122	105	040	
	030447	117	116	040	
	030452	042	115	101	
	030455	111	116	042	
	030460	040	106	125	
	030463	116	103	124	
	030466	111	117	116	
	030471	056	100		
37	030473	040	120	117	PLTXTO: .ASCII / PORT XMTR TIMED OUT.®/
	030476	122	124	040	
	030501	130	115	124	
	030504	122	040	124	
	030507	111	115	105	
	030512	104	040	117	
	030515	125	124	056	
	030520	100			
38	030521	040	120	117	PLRCTO: .ASCII / PORT RCVR TIMED OUT.®/
	030524	122	124	040	
	030527	122	103	126	
	030532	122	040	124	
	030535	111	115	105	
	030540	104	040	117	
	030543	125	124	056	
	030546	100			
39	030547	040	120	117	PLDERR: .ASCII / PORT-LOOP DETECTED DATA ERROR.®/
	030552	122	124	055	
	030555	114	117	117	
	030560	120	040	104	
	030563	105	124	105	
	030566	103	124	105	
	030571	104	040	104	
	030574	101	124	101	
	030577	040	105	122	
	030602	122	117	124	
	030605	056	100		
40	030607	040	110	117	SYSER: .ASCII / HOST SYS ERROR. RUN LOGIC TEST.®/
	030612	123	124	040	
	030615	123	131	123	
	030620	040	105	122	
	030623	122	117	122	
	030626	056	040	122	
	030631	125	116	040	
	030634	114	117	107	
	030637	111	103	040	
	030642	124	105	123	
	030645	124	056	100	
41	030650	040	042	104	DIAGF: .ASCII / "DIAG" FUNC GAVE WRONG FUNC CODE.®/
	030653	111	101	107	
	030656	042	040	106	
	030661	125	116	103	
	030664	040	107	101	
	030667	126	105	040	
	030672	127	122	117	
	030675	116	107	040	
	030700	106	125	116	

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 38 7
 CONSTANTS, VARIABLES & ACSII

	030703	103	040	103	
	030706	117	104	105	
	030711	056	100		
42	030713	040	125	123	DIAGUF: .ASCII / USOF WRONG ON "DIAG" FUNC.8/
	030716	117	106	040	
	030721	127	122	117	
	030724	116	107	040	
	030727	117	116	040	
	030732	042	104	111	
	030735	101	107	042	
	030740	040	106	125	
	030743	116	103	056	
	030746	100			
43	030747	040	106	117	FIFUN: .ASCII / FORCE INTERROGATE FUNC GAVE WRONG FUNC CODE8/
	030752	122	103	105	
	030755	040	111	116	
	030760	124	105	122	
	030763	122	117	107	
	030766	101	124	105	
	030771	040	106	125	
	030774	116	103	040	
	030777	107	101	126	
	031002	105	040	127	
	031005	122	117	116	
	031010	107	040	106	
	031013	125	116	103	
	031016	040	103	117	
	031021	104	105	100	
44	031024	040	125	123	FIFUF: .ASCII / USOF WRONG ON FORCE INTERROGATED8/
	031027	117	106	040	
	031032	127	122	117	
	031035	116	107	040	
	031040	117	116	040	
	031043	106	117	122	
	031046	103	105	040	
	031051	111	116	124	
	031054	105	122	122	
	031057	117	107	101	
	031062	124	105	100	
45	031065	040	103	117	FICME: .ASCII / COMMUNICATION ERROR DURING FORCE INTERROGATED8/
	031070	115	115	125	
	031073	116	111	103	
	031076	101	124	111	
	031101	117	116	040	
	031104	105	122	122	
	031107	117	122	040	
	031112	104	125	122	
	031115	111	116	107	
	031120	040	106	117	
	031123	122	103	105	
	031126	040	111	116	
	031131	124	105	122	
	031134	122	117	107	
	031137	101	124	105	
	031142	100			

46

.EVEN

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 39
 CONSTANTS, VARIABLES & ASCII

```

1          ;TABLE STORAGE
2
3
4          ;TABLE OF BAUD RATE MESSAGE POINTERS
5
6 031144   031164   BDRTBL: .WORD   BD1
7 031146   031171   .WORD   BD2
8 031150   031176   .WORD   BD3
9 031152   031204   .WORD   BD4
10 031154   031212   .WORD   BD5
11 031156   031220   .WORD   BD6
12 031160   031226   .WORD   BD7
13 031162   031244   .WORD   BD8
14
15          ;TABLE OF ASCII STORAGE FOR BAUD RATES
16
17 031164   04C     063   060  BD1:   .ASCII / 300B/
    031167   060     100
18 031171   040     066   060  BD2:   .ASCII / 600B/
    031174   060     100
19 031176   040     061   062  BD3:   .ASCII / 1200B/
    031201   060     060   100
20 031204   040     062   064  BD4:   .ASCII / 2400B/
    031207   060     060   100
21 031212   040     064   070  BD5:   .ASCII / 4800B/
    031215   060     060   100
22 031220   040     071   066  BD6:   .ASCII / 9600B/
    031223   060     060   100
23 031226   040     042   110  BD7:   .ASCII / "HIGH" SPEEDB/
    031231   111     107   110
    031234   042     040   123
    031237   120     105   105
    031242   104     100
24 031244   040     042   123  BD8:   .ASCII / "SPECIAL" SPEEDB/
    031247   120     105   103
    031252   111     101   114
    031255   042     040   123
    031260   120     105   105
    031263   104     100
25          .EVEN
26
27          ;DATA TABLE FOR MAINTENANCE AND DIAGNOSTIC FUNCTION
28
29 031266   000001   DATBL: .WORD   001
30 031270   000003   .WORD   003
31 031272   000007   .WORD   007
32 031274   000017   .WORD   017
33 031276   000037   .WORD   037
34 031300   000077   .WORD   077
35 031302   000177   .WORD   177
36 031304   000377   .WORD   377
37 031306   000376   .WORD   376
38 031310   000374   .WORD   374
39 031312   000370   .WORD   370
40 031314   000360   .WORD   360
41 031316   000340   .WORD   340
42 031320   000300   .WORD   300

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CZCMJCO CMB(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 39-1
CONSTANTS, VARIABLES & ACSII

43 031322 000200
44 031324 000000
45

.WORD 200
.WORD 000

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 40
 CONSTANTS, VARIABLES & ACSII

```

1          ;PORT CONFIGURATION STATUS TABLES.
2
3 031326   EXTBL1: .BLKW 64.
4 031526   EXTBL2: .BLKW 64.
5 031726   EXTBL3: .BLKW 64.
6 032126   EXTBL4: .BLKW 64.
7
8          ;TABLE FOR ORIGINAL (PWR-UP) VERSION DATA
9
10 032326  VERSP: .BLKW 9.
11
12         ;TABLE FOR 2ND VERSION DATA
13
14 032350  VERSUN: .BLKW 9.
15
16         ;SOFTWARE FLAG BYTES
17
18 032372   000      CLKFL1: .BYTE 0          ;CLOCK TICKING
19 032373   000      CLKFLG: .BYTE 0         ;CLOCK PRESENT
20 032374   000      CONFLG: .BYTE 0         ;CONTINUE FLAG
21 032375   000      CNFGFL: .BYTE 0        ;CONFIGURATION AVAILABLE
22 032376   000      DBFLG: .BYTE 0         ;DEBUG FLAG
23 032377   000      FAST: .BYTE 0          ;"FAST" EXERCISE RUN FLAG
24 032400   000      GOFLG: .BYTE 0         ;"GO" FLAG
25 032401   000      HOURS: .BYTE 0         ;HOURS STORAGE
26 032402   000      INCF: .BYTE 0          ;LINE FEED FLAG
27 032403   000      LSIFLG: .BYTE 0        ;THIS IS AN 11/03
28 032404   000      MINS: .BYTE 0          ;MINUTES STORAGE
29 032405   000      OFLOF: .BYTE 0         ;ERROR COUNT OVERFLOW
30 032406   000      ONCE: .BYTE 0          ;INDICATOR THAT CONFIG HAS BEEN PRINTED
31 032407   000      PNCFLG: .BYTE 0        ;PRINTED ANY REMOTE INFO?
32 032410   000      SAFE: .BYTE 0          ;DON'T ALLOW *F IN FILL COUNT RTN.
33 032411   000      SECS: .BYTE 0          ;SECONDS STORAGE
34 032412   000      SLFL: .BYTE 0          ;"SLASH" FLAG
35 032413   000      THRUF: .BYTE 0         ;"THRU" FLAG
36 032414   000      TICKS: .BYTE 0         ;1/60 SEC. TICKS STORAGE
37         .EVEN

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CZCMLJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 41
 CONSTANTS, VARIABLES & ACSII

```

1          ;VARIABLES:
2
3 032416 000000 ADDR: .WORD 0
4 032420 000000 ALLFLG: .WORD 0
5 032422 000000 BAUD: .WORD 0
6 032424 000000 CHNGFL: .WORD 0
7 032426 000000 CLK: .WORD 0
8 032430 000000 CNTR: .WORD 0
9 032432 000000 CSR: .WORD 0
10 032434 000000 DEVER: .WORD 0
11 032436 000000 ERRCNT: .WORD 0
12 032440 000000 ITER: .WORD 0
13 032442 000000 LINLEN: .WORD 0
14 032444 000000 MASK: .WORD 0
15 032446 000000 PASCNT: .WORD 0
16 032450 000000 PAT: .WORD 0
17 032452 000000 PCONT: .WORD 0
18 032454 000000 PORN: .WORD 0
19 032456 000000 PORT: .WORD 0
20 032460 000000 PRIO: .WORD 0
21 032462 000000 REMFLG: .WORD 0
22 032464 000000 REMNO: .WORD 0
23 032466 000000 REMTN: .WORD 0
24 032470 000000 REMST: .WORD 0
25 032472 000000 SAVEC: .WORD 0
26 032474 000000 SPAR: .WORD 0
27 032476 000000 SPDR: .WORD 0
28 032500 000000 SR: .WORD 0
29 032502 000000 SWREG: .WORD 0
30 032504 000000 SWRFLG: .WORD 0
31 032506 000000 TALLY: .WORD 0
32 032510 000000 TBLAD: .WORD 0
33 032512 000000 TEMP: .WORD 0
34 032514 000000 VERFLG: .WORD 0
35 032516 000000 WORD: .WORD 0
36
37
38          ;CONSTANTS:
39
40 032520 000170 VECTOR: .WORD 170
41 032522 164070 DEVADR: .WORD 164070
42 032524 000004 FKPRIO: .WORD 4
43 032526 177562 KPD: .WORD 177562
44 032530 177560 KBS: .WORD 177560
45 032532 177546 LCS: .WORD 177546
46 032534 177566 TT8: .WORD 177566
47 032536 177564 TTS: .WORD 177564
48
49          .END
000001

```

SYMBOL TABLE

ADDR	032416	CONTW1	020276	EXSOB	012774	INTCMR	006456	PLRCTO	030521
AGAIN	022624	CRPRM	003226	EXSOC	013012	INTCNT	006416	PLTM	024717
ALLFLG	032420	CRTST	003236	EXS0D	013136	INVLAD	022767	PLTXTO	030473
ALROFF	025474	CSR	032432	EXSONA	012764	IRRGHG	025461	PNCFLG	032407
BAD	020100	CSRCE	027271	EXS00	012654	ISATE	026706	PNT	022114
BAUD	032422	CSRRST	026605	EXS01	013214	ISDTE	027030	PNTCNF	021556
BAUDM	024537	CSRWE	027237	EXS01A	013256	ISP	002000	PNTCX	021604
BCNTO	003034	DATBL	031266	EXS2	013312	ITER	032440	PNTCO	021574
BCNT1	003040	DATLER	030226	EXS2B	013352	JUST	022074	PNTEND	012440
BCNT2	003070	DBAID	022742	EXS2C	013402	KBBUF	021530	PNTXT	022056
BCNT3	003064	DBFLG	032376	EXS3	013412	KBD	032526	PNTRTN	012522
BCNT4	003114	DECJSP	021740	EXS3A	013460	KBRD	021060	PNT0	012456
BCONT	002674	DECPNT	021712	EXS3B	013502	KBRET	021072	PNT1	012464
BDRTBL	031144	DERR	020012	EXTBL1	031326	KBS	032530	POK	011232
BD1	031164	DEVADR	032522	EXTBL2	031526	KRTN	021524	PORCN	015602
BD2	031171	DEVER	032434	EXTBL3	031726	LCS	032532	PORCNF	015356
BD3	031176	DEVGEN	017546	EXTBL4	032126	LDQFC	014312	PORLD	015570
BD4	031204	DIAGF	030650	EX1	020340	LDQLP	014266	PORN	032454
BD5	031212	DIAGFU	013730	EX2	020356	LDQRT	014330	PORT	032456
BD6	031220	DIAGNF	016250	EX3	020370	LDQUE	014172	PORTLP	011154
BD7	031226	DIAGUF	030713	EX4	020406	LGKTM	024320	PORTMS	025245
BD8	031244	DIAGO	016332	EX5	020440	LINLEN	032442	PORTN	024745
BEGIN	002000	DIAG00	016350	EX6	020452	LOGTST	003160	PORTOM	024555
BINPNT	021664	DIAG1	016370	FAST	032377	LSIFLG	032403	PORT1M	024571
BRKCOM	024335	DIAG10	016406	FICME	031065	LSTST	017406	PORT2M	024605
B00	= 000001	DIAG2	016474	FIFUF	031024	MASK	032444	PORT3M	024621
B01	= 000002	DIAG3S	016660	FIFUN	030747	MINS	032404	PORXT	015632
B02	= 000004	DIAG4	016666	FILL	021532	MONCH	020172	PORO	015452
B03	= 000010	DIERR	027204	FILMSG	021536	MONIC	020166	POROO	015470
B04	= 000020	DIVID	022024	FKPRIO	032524	MONIT	020152	POR1	015544
B05	= 000040	DIVSET	022022	FLCNT	021534	MOV	005544	PRDFLT	017612
B06	= 000100	DPCSTA	000000	FRAD	022577	MOV8	003302	PREML	016230
B07	= 000200	DTLGN	025537	GDINT	006404	N	= 000057	PREMO	016102
B08	= 000400	DVATS1	017434	GETCHR	020636	NEK	021052	PREM1	016212
B09	= 001000	DVECT	022657	GETDG	022042	NOCNF	023105	PRI0	032460
B10	= 002000	DVPRI0	022703	GOFLG	032400	NOGO	026477	PRLC	011162
B11	= 004000	ELTIM	024651	GOOD	020076	NOINTR	027441	PRMT1	002176
B12	= 010000	ENDCHK	012322	GRMLP	025670	NOKEFL	021526	PRMT2	002222
B13	= 020000	ENDPS	024635	GTREM	025602	NOREM	025137	PRMT3	002310
B14	= 040000	ENDO	012402	HDER	017654	NOTUP	026534	PRMT4	002376
B15	= 100000	ENPRTN	011072	HELPM	023226	NRTN	021034	PRMT5	002422
CCRTN	020266	ENRET	011152	HITER	027573	NULLS	021770	PRNREM	016062
CELP	012604	ENO1	011142	MLPASK	003144	NULOUT	022012	PRNTIM	020454
CHNGFL	032424	ERCTM	024664	MLPDSR	024253	NUPNT	022014	PROMT	002116
CLK	032426	ERINT	006342	HOURS	032401	OCTJSP	021634	PRTCNF	013610
CLKEXT	002672	ERINTR	027477	HMSWR	= 177570	OCTPNT	021606	PS	= 177776
CLKFLG	032373	ERINT1	006462	IFORCE	014332	ODTPR	016676	PSTE	011374
CLKFL1	032372	ERR	017726	IFRCN	014440	OFLOF	032405	PSTS	011536
CLKINT	002600	ERRAD	020072	IFRCNS	014642	ONCE	032406	PST0	011300
CLKTRP	002572	ERRCNT	032436	IFRCN1	014526	OSPTE	026774	PST1	011362
CLTBER	027142	ERRM	020102	IFRCN2	014650	OSDTE	026737	PST2	011410
CMREXC	012532	ERRNUM	020074	IFRCN3	014756	OVFLM	024702	PST2A	011416
CNFGFL	032375	ERR1	017740	IFRC2S	014750	PASCNT	032446	PST3	011520
CNTR	032430	EXCM	025027	IFRW0	014422	PAT	032450	PST4	011546
COMST	025346	EXRCS	012542	IFRWTO	014402	PCONT	032452	PST5	011602
CONFLG	032374	EXSGO	013174	INCF	032402	PLDERR	030547	PST6	011630
CONFMS	025267	EXSOA	012674	INPKB	020620	PLFFE	030430	PST60	011644

CZCMJCO CHR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 41 2
 SYMBOL TABLE

PST7	011672	SCA2A	015212	ST1	003354	ST205	007556	TSTHDR	022212
PST7S	011760	SCA2B	015234	ST1A	003362	ST206	007636	TSTRSK	003120
PST8	011772	SCA2C	015246	ST10	004422	ST207	007724	TSTSEL	023177
PST8S	012060	SCA2D	015254	ST100	004434	ST21	010012	TTB	032534
PST80	012072	SCA2E	015266	ST101	004506	ST22	010040	TTO	022122
PST80S	012160	SCA2F	015310	ST110	004520	ST220	010120	TTOLF	022144
PST9	012172	SCA3	015330	ST110S	004622	ST221	010126	TTOLP	022126
PST9S	012314	SCONT	017530	ST111	004630	ST222	010224	TTS	032536
P0	000000	SCORTN	017544	ST112	004652	ST223	010312	TWOSP	023071
P1	000040	SCPAD	024463	ST120	004664	ST224	010326	TYPCR	024777
P2	000100	SCPRTN	017474	ST120S	004760	ST23	010424	TYPCTP	023151
P3	000140	SECS	032411	ST121	004766	ST23A	010436	TYPOT	020556
P4	000200	SKPD2	013516	ST13	005004	ST230	010472	USOFE1	030077
P5	000240	SKPX0	013534	ST130	005010	ST24	011006	USOFE2	030171
P6	000300	SKPX1	013600	ST131	005066	ST25	011024	USOFE3	030330
P7	000340	SKP1	013746	ST131A	005034	ST26	011062	USOFE4	030373
RADIX	022210	SKP1A	013766	ST131B	005042	ST3	003542	USORM	025335
RECON	024412	SKP1B	013772	ST132	005100	ST4	003562	VECTOR	032520
REGMG	025450	SKP2	014000	ST132S	005174	ST6	003602	VERFLG	032514
REGRES	017370	SKP3	014016	ST133	005202	ST60	003656	VERSH	024504
REGSAV	017354	SKP3A	014036	ST134	005222	ST61	003672	VERSP	032326
REMG	025366	SKP3B	014042	ST135	005236	ST62	004002	VERSUN	032350
REMLG	032462	SKP4	014050	ST135S	005332	ST7	004042	VIDER	027673
REMO	032464	SKP5	014066	ST136	005340	ST70	004052	VISF	027633
REMSG	025255	SKP5A	014106	ST14	005356	ST71	004124	WDAT	020115
REMST	032470	SKP5B	014112	ST15	005442	ST80	004134	WDSOB	020127
REMSTM	025424	SKP6	014120	ST150	005616	ST80S	004236	WDWAS	020143
REMTN	032466	SKP7	014136	ST16	005640	ST81	004244	WORD	032516
REPORT	015660	SKP7A	014156	ST160	005726	ST82	004266	WPODT	027532
REPO	015732	SKP7B	014162	ST161	006014	ST90	004302	\$0\$	016740
REP1	015762	SKP8	014170	ST162	006122	ST90S	004376	\$00\$	016714
REP2	016012	SLFL	032412	ST17	006230	ST91	004404	\$1\$	016744
REP20	016042	SLOW	025056	ST170	006254	SWDHP	020204	\$10\$	017030
REP3	016060	SPAR	032474	ST170R	006336	SWMLT	017454	\$11\$	017154
RESTR	002520	SPAVFE	027374	ST18	006530	SWREG	032502	\$13\$	017272
RJFLG	022206	SPAVIC	027742	ST180	006640	SWRFLG	032504	\$2A\$	017056
RMB	025657	SPAVME	027330	ST181	006666	SWRMSG	023075	\$2\$	017042
RQSPCL	027062	SPDR	032476	ST182	006730	SYSER	030607	\$20\$	017222
RSPMF	030266	SPRCLR	026632	ST183	007020	TALLY	032506	\$21\$	017234
RSPEF	030036	SPRDAT	026657	ST19	007040	TBLAD	032510	\$22\$	017252
RSSPCL	027112	SR	032500	ST2	003456	TEMP	032512	\$23\$	017304
SAFE	032410	SRTST	017416	ST20	007146	THRUF	032413	\$24\$	017352
SAVEC	032472	SSWR	032502	ST200	007256	TICKS	032414	\$25\$	017322
SBAK	017512	STATEM	025323	ST201	007272	TPCONT	020604	\$26\$	017334
SCALM	014766	STEMF	030140	ST202	007352	TPOFCH	020560	\$3\$	017110
SCART	015354	STESTF	030005	ST203	007440	TPOUTX	020614	\$4\$	017116
SCA1	015030	STRMN	013150	ST204	007526	TRP4	023033	\$5\$	017134
SCA2	015116	STO	003272						

. ABS. 032540 000
 ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 8704 WORDS (34 PAGES)
 DYNAMIC MEMORY AVAILABLE FOR 64 PAGES
 CZCMJC/E:ABS,CZCMJC/C:E:M:S:R=CZCMJB.MAC

\$0\$	28-24#	28-36													
\$00\$	28-18	28-21#													
\$1\$	28-25#	28-38	28-83												
\$10\$	28-31	28-37#	28-71												
\$11\$	28-40	28-58#	28-75	28-78											
\$13\$	28-66	28-76#													
\$2\$	28-29	28-39#													
\$20\$	28-42	28-65#													
\$21\$	28-57	28-68#													
\$22\$	28-70	28-72#													
\$23\$	28-77	28-79#													
\$24\$	28-89	28-91#													
\$25\$	28-80	28-84#													
\$26\$	28-85	28-87#													
\$2A\$	28-43#	28-82													
\$3\$	28-46	28-49#													
\$4\$	28-48	28-50#	28-53												
\$5\$	28-51	28-54#													
ADDR	28-24*	28-25	28-27*	28-28	28-30	28-54*	28-58	28-67*	28-68	41-3#					
AGAIN	3-33	3-47	3-57	3-61	17-35	18-59	28-37	33-45	37-13#						
ALLFLG	17-15*	17-28*	17-33*	17-123	41-4#										
ALROFF	23-50	25-33	37-72#												
B00	1-51#	7-12	21-28	22-17	24-23	27-21	28-49								
B01	1-50#														
B02	1-49#														
B03	1-48#														
B04	1-47#	10-5	10-39	17-122	21-10	22-16	22-58	23-13	24-13	24-53	27-20	27-54	28-43		
B05	1-46#	23-31													
B06	1-45#	23-35													
B07	1-44#	28-47													
B08	1-43#	7-17	7-18												
B09	1-42#	7-23	8-8	8-10	8-51	8-54	8-56	8-62	9-11	17-110					
B10	1-41#	6-27	16-66	17-146	18-167										
B11	1-40#	16-62	17-142	18-163	23-54										
B12	1-39#	23-6													
B13	1-38#	23-17	29-57												
B14	1-37#	6-31	6-41	6-48	7-9	7-21	8-22	8-23	8-39	8-40	8-68	8-69	8-85	8-86	
	9-22	9-23	9-38	9-39	10-10	10-35	11-8	11-15	11-25	11-35	12-11	12-16	12-31	13-13	
	13-22	13-30	13-50	14-23	14-29	14-36	14-43	14-48	14-54	14-61	14-68	15-15	15-22	15-29	
	15-33	15-40	17-12	17-79	17-80	17-89	17-90	17-99	17-100	17-113	17-114	18-46	18-127	21-29	
	22-19	22-29	22-37	22-38	22-49	22-50	23-22	24-24	24-32	27-22	27-31	27-38	27-39		
B15	1-36#	13-10	13-15	14-23	14-48	28-50									
BAD	6-35*	6-36*	6-37	6-43*	6-44*	6-46	7-7*	7-16*	7-17*	7-19	8-19*	8-20	8-36*	8-37	
	8-65*	8-66	8-82*	8-83	9-19*	9-20	9-35*	9-36	10-7*	10-8	10-31*	10-32	11-5*	11-6	
	11-12*	11-13	13-9*	13-10*	13-11	13-25*	13-27*	13-28	14-24*	14-25	14-33*	14-34	14-40*	14-41	
	14-49*	14-50	14-58*	14-59	14-65*	14-66	15-18*	15-20	15-26*	15-27	15-37*	15-38	17-109*	22-26*	
	22-27	22-34*	22-35	27-28*	27-29	27-35*	27-36	29-129	29-139#						
BAUD	14-70	16-9	41-5#												
BAUDH	16-16	37-46#													
BCNT0	5-23	5-25#													
BCNT1	5-21	5-26#													
BCNT2	5-27	5-32#													
BCNT3	5-29	5-31#													
BCNT4	5-35	5-37#													
BCONT	3-94	5-4#	5-17	5-42	5-44	30-42	.0-50	33-28							
BD1	39-6	39-17#													

BD2	39-7	39-18#												
BD3	39-8	39-19#												
BD4	39-9	39-20#												
BD5	39-10	39-21#												
BD6	39-11	39-22#												
BD7	39-12	39-23#												
BD8	39-13	39-24#												
BDRtbl	16-24	16-32	16-44	16-52	39-6#									
BEGIN	1-52	3-3	3-10#											
BINPNT	35-30#													
BRKCOM	6-13	37-42#												
CCRTN	30-28#													
CELP	18-42#	18-45												
CHNGFL	18-108#	18-130	18-139	18-144#	19-5#	19-19	23-51#	41-6#						
CLK	6-50#	6-54#	26-27#	26-30#	27-5#	27-17#	41-7#							
CLKEXT	4-7	4-11	4-15	4-18#										
CLKFL1	4-4#	5-7#	17-149	18-170	40-18#									
CLKFLG	3-74#	3-96#	5-22	5-28	5-34	28-17	28-84	40-19#						
CLKINT	3-87	4-4#												
CLKTRP	3-75	3-96#												
CLTBER	10-10	38-14#												
CNREXC	5-37	18-34#												
CNFGFL	5-6#	18-151#	34-5	40-21#										
CNTR	6-26#	6-29#	6-33#	6-39#	10-25#	10-28#	10-34#	10-37#	13-5#	13-6#	14-8#	14-27#	14-45#	14-52#
	16-11#	16-14#	17-7#	17-10#	17-49#	17-53#	18-41#	18-44#	20-5#	20-14#	20-18#	20-27#	20-30#	20-39#
	20-42#	20-51#	21-12#	21-14	21-25#	24-41#	24-47#	25-8#	25-14#	25-20#	25-26#	26-20#	41-8#	
CONST	22-52	37-67#												
CONFLG	28-79	33-23#	33-91#	40-20#										
CONFMS	25-4	37-64#												
CONTW1	30-29#	30-30	30-36											
CRPM	6-14#	6-15	6-20											
CRTST	6-15#													
CSR	6-27	6-35	6-43	10-5#	10-7	10-24#	10-26	10-31	10-36#	10-39#	11-4#	11-5	11-11#	11-12
	11-17#	11-27#	12-8#	12-12#	12-20#	12-23#	12-25#	12-30#	13-4#	13-9	13-15	13-42#	14-9#	14-22#
	14-24	14-46#	14-47#	14-49	15-5#	15-14#	15-15	15-31#	15-32#	15-33	17-8	17-38#	17-66#	17-67#
	17-68	17-122#	18-42	18-109#	18-110#	18-111#	18-127	18-129#	18-145#	21-10#	21-28#	21-29	22-16#	22-17#
	22-19	22-58#	23-6	23-13#	23-17	23-52#	23-54	23-57#	24-13#	24-23#	24-24	24-53#	27-20#	27-21#
	27-22	27-54#	28-22	28-30	28-32	28-43#	28-47#	28-49#	28-50	29-70#	41-9#			
CSRCE	11-15	38-17#												
CSRST	6-48	38-5#												
CSRVE	11-8	38-16#												
DATBL	17-50	27-6	39-29#											
DATLER	14-68	38-32#												
DBAID	28-23	37-16#												
DBFLG	5-13#	28-21#	28-87#	30-53	33-29	33-59	33-62	40-22#						
DECJSP	18-70	35-48#												
DECPNT	16-77	16-84	30-69	30-73	30-77	30-81	35-39#							
DERR	6-41	6-48	7-9	7-21	8-22	8-39	8-68	8-85	9-22	9-38	10-10	10-35	11-8	11-15
	13-13	13-30	14-29	14-36	14-43	14-54	14-61	14-68	15-22	15-29	15-40	17-113	22-29	22-37
	27-31	27-38	29-122#											
DEVAOR	3-26	3-36	3-39#	29-69	41-41#									
DEVER	3-13#	41-10#												
DEVGEM	3-69	29-69#												
DIAGO	27-15#	27-18												
DIAG00	27-19#	27-32	27-53											
DIAG1	27-22#	27-25												

DIAG10	27-23	27-26#												
DIAG2	27-30	27-33#												
DIAG3S	27-40	27-53#												
DIAG4	27-37	27-54#												
DIAGF	27-31	38-41#												
DIAGFU	18-141	20-4#												
DIAGNF	20-13	20-26	20-38	20-50	27-5#									
DIAGUF	27-38	38-42#												
DIERR	10-35	38-15#												
DIVID	36-6#	36-10												
DIVSET	36-5#	36-15												
DPCSTA	2-4#													
DTLGN	18-50	37-73#												
DVATST	2-6	3 35	29-36#											
DVECT	3-40	37-14#												
DVPRIO	3-50	37-15#												
ELTIM	30-67	37-52#												
ENO1	16-80	16-83#												
ENDO	17-126	17-133#												
ENDCHK	17-76	17-86	17-96	17-106	17-122#									
ENDPS	16-75	37-51#												
ENPRM	16-69	16-75#	17-148	18-169										
ENRET	16-82	16-85#												
ERCTM	16-78	37-53#												
ERINT	12-3	12-15#												
ERINT1	12-22	12-29#												
ERINTR	12-16	38-21#												
ERR	6-31	11-25	11-35	12-11	12-16	12-31	13-22	13-50	17-12	17-79	17-89	17-99	18-46	22-49
	23-22	24-32	29-108#											
ERR1	29-110#	29-124												
ERRAD	29-108#	29-109#	29-115	29-122#	29-123#	29-136#								
ERRCNT	6-11#	16-83	17-17#	18-40#	29-61#	41-11#								
ERRM	29-111	29-144#												
ERRNUM	6-31#	6-41#	6-48#	7-9#	7-21#	8-22#	8-39#	8-68#	8-85#	9-22#	9-38#	10-10#	10-35#	11-8#
	11-15#	11-25#	11-35#	12-11#	12-16#	12-31#	13-13#	13-22#	13-30#	13-50#	14-29#	14-36#	14-43#	14-54#
	14-61#	14-68#	15-22#	15-29#	15-40#	17-12#	17-79#	17-89#	17-99#	17-113#	18-46#	22-29#	22-37#	22-49#
	23-22#	24-32#	27-31#	27-38#	29-112	29-137#								
EX1	30-18	30-39#												
EX2	30-40	30-43#												
EX3	30-44	30-47#												
EX4	30-48	30-51#												
EX5	30-52	30-54	30-56	30-59#										
EX6	30-14	30-60	30-62#											
EXCM	18-48	37-58#												
EXRCS	18-36#													
EXS00	18-43	18-48#												
EXS01	18-63	18-108#												
EXS01A	18-113	18-115#												
EXS0A	18-50#	18-52	18-60											
EXS0B	18-56	18-65#	18-86	18-90										
EXS0C	18-68#	18-74	18-85	18-97										
EXS0D	18-80	18-88#												
EXS0NA	18-58	18-62#												
EXS2	18-125#	18-136	18-138	18-156	18-159	18-175								
EXS2B	18-128	18-133#												
EXS2C	18-141#													

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24.05 PAGE S-4
 CROSS REFERENCE TABLE (CREF V04.00)

EXS3	18-131	18-134	18-140	18-143#										
EXS3A	18-147	18-153#												
EXS3B	18-149	18-152	18-157#											
EXSGO	18-89	18-96	18-103#											
EXTBL1	3-81*	18-65	18-103*	18-118*	19-7	20-4	21-9	25-7	40-3#					
EXTBL2	3-82*	18-119*	19-10	20-17	25-13	40-4#								
EXTBL3	3-83*	18-120*	19-13	20-29	25-19	40-5#								
EXTBL4	3-84*	18-121*	19-16	20-41	25-25	40-6#								
FAST	18-34*	18-62*	18-105*	18-112	20-9	20-22	20-34	20-46	40-23#					
FICME	22-49	38-45#												
FIFUF	22-37	38-44#												
FIFUN	22-29	38-43#												
FILL	33-38	33-41	33-47*	33-100#	35-56	36-42								
FILMSG	33-36	33-102#												
FKPRIO	3-51	41-42#												
FLCNT	33-101#	35-56*	35-59*	36-42*	36-45*									
FRAD	3-25	37-12#												
GDINT	12-7	12-19#												
GETCHR	32-12#	32-34	32-39	32-46										
GETDG	36-7	36-11#												
GOFLG	28-41	28-81	33-21*	33-86*	40-24#									
GOOD	6-34*	6-37	6-45*	6-46	7-6*	7-13*	7-14*	7-15	7-18*	7-19	8-18*	8-20	8-35*	8-37
	8-64*	8-66	8-80*	8-83	9-18*	9-20	9-34*	9-36	10-6*	10-8	10-30*	10-32	11-3*	11-6
	11-10*	11-13	13-8*	13-11	13-24*	13-26*	13-28	14-23*	14-25	14-32*	14-34	14-39*	14-41	14-48*
	14-50	14-57*	14-59	14-64*	14-66	15-19*	15-20	15-25*	15-27	15-36*	15-38	17-112*	22-25*	22-27
	22-33*	22-35	27-27*	27-29	27-34*	27-36	29-126	29-138#						
GRMLP	18-83	37-76#												
GTREM	18-67	37-74#												
HDER	3-37	3-85	29-94#											
HELPM	5-41	37-24#												
HITER	13-13	38-23#												
HLPASK	5-40	5-43#												
HLPSR	5-43	37-40#												
HOURS	4-17*	5-11*	30-68	40-25#										
HWSMR	1-9#	3-21												
IFORCE	20-11	20-24	20-36	20-48	22-7#									
IFRC2S	22-51	22-56#												
IFRON	22-20	22-24#												
IFRON1	22-28	22-32#												
IFRON2	22-36	22-46#												
IFRON3	22-48	22-58#												
IFRONS	22-39	22-44#												
IFRWT	22-19#	22-22												
IFRWT0	22-15#	22-30	22-44	22-56										
INCF	28-65	33-20*	33-77*	40-26#										
INPKB	3-29	3-44	3-54	5-18	6-17	17-24	17-58	18-53	18-75	28-26	28-63	30-25	32-8#	33-42
INTCNR	12-28#													
INTCNT	12-14	12-22#	12-32											
INVLAD	29-37	37-17#												
IRRGMG	23-37	37-71#												
ISATE	8-22	38-8#												
ISOTE	8-85	38-11#												
ISP	1-52#	3-4	3-10	29-36	29-95	29-101	30-41	30-49	33-27					
ITER	6-8*	16-60*	16-64*	17-14*	17-140*	17-144*	18-38*	18-161*	18-165*	41-12#				
JUST	36-22#	36-25												
KBBUF	3-26*	3-31	3-39	3-41*	3-45	3-49	3-51*	3-55	3-59	3-63*	3-64*	3-65*	3-66*	3-67*

	3-68	5 16*	5-20	5-26	5-32	5-39	6-16*	6 19	17-22*	17 26	17 37	17 57*	17-60	18-51*
	18 55	18 57	18-73*	18 77	18-81	18-93	28-25*	28-27	28-62*	28 64	29-84	30-23*	30 27	32-10
	32-11*	32-26*	32-28*	32-30*	32 31	32-42*	32-43*	32-44*	32-45*	32 50*	33 41*	33 43	33 47	33 99*
KBO	30-15	30 31	33-19	41-43*										
KBRD	32-12	33 17*	33-18											
KBRET	30-58	33-20*												
KBS	30 12	30-29	33-17	41-44*										
KRTN	33-35	33-53	33 57	33-60	33-65	33 71	33 78	33 90	33 93*					
LCS	3-76	5-24*	5-30*	5-36*	28-19	28 20*	28-86*	41 45*						
LDQFC	21-29*	21-32												
LDQLP	21-23*	21-26												
LDQRT	21-30	21-33*												
LDQUE	18-104	21 9*												
LKTSM	6-12	37-41*												
LINLEN	25-6*	26-22*	26-24*	26-35*	41-13*									
LOGTST	5-25	6-7*												
LSIFLG	3-14*	29-25*	40-27*											
LSTST	3-15	29-25*												
MASK	7-12*	7-26	7-27*	41-14*										
MINS	4-13*	4-14	4-16*	5-10*	30-72	40-28*								
MONCH	30-16*													
MONIC	30-13	30-15*												
MONIT	7-28	16-71	17-70	17-75	17-153	18-126	18-132	18-174	21-31	24-28	28-52	29-52	30-11*	
MOV	13-6*	13-7												
MOV8	6-27*	6-30												
N	1-58*	6-31	6-31	6-31*	6-41	6-41	6-41*	6-48	6-48	6-48*	7-9	7-9	7-9*	7-21
	7-21	7-21*	8-22	8-22	8-22*	8-39	8-39	8-39*	8-68	8-68	8-68*	8-85	8-85	8-85*
	9-22	9-22	9-22*	9-38	9-38	9-38*	10-10	10-10	10-10*	10-35	10-35	10-35*	11-8	11-8
	11-8*	11-15	11-15	11-15*	11-25	11-25	11-25*	11-35	11-35	11-35*	12-11	12-11	12-11*	12-16
	12-16	12-16*	12-31	12-31	12-31*	13-13	13-13	13-13*	13-22	13-22	13-22*	13-30	13-30	13-30*
	13-50	13-50	13-50*	14-29	14-29	14-29*	14-36	14-36	14-36*	14-43	14-43	14-43*	14-54	14-54
	14-54*	14-61	14-61	14-61*	14-68	14-68	14-68*	15-22	15-22	15-22*	15-29	15-29	15-29*	15-40
	15-40	15-40*	17-12	17-12	17-12*	17-79	17-79	17-79*	17-89	17-89	17-89*	17-99	17-99	17-99*
	17-113	17-113	17-113*	18-46	18-46	18-46*	22-29	22-29	22-29*	22-37	22-37	22-37*	22-49	22-49
	22-49*	23-22	23-22	23-22*	24-32	24-32	24-32*	27-31	27-31	27-31*	27-38	27-38	27-38*	
NEK	32-49	32-53*												
NOCHF	34-9	37-21*												
NOGO	6-31	17-12	18-46	38-3*										
NOINTR	12-11	38-20*												
NOKEFL	32-8*	32-33*	32-40*	32-48	33-98*									
NOREM	18-154	37-60*												
NOTUP	6-41	38-4*												
NRTRN	32-16	32-48*	33-83	33-88	33-92									
NULS	3-23	5-14	16-57	16-68	16-70	17-152	18-173	29-100	35-56*					
NULOUT	35-61*													
NURPNT	35-15	35-24	35-33	35-42	35-51	36-3*								
OCTJSP	26-12	28-33	28-60	35-21*										
OCTPNT	8-27	8-44	8-73	8-90	9-27	9-43	17-84	17-94	17-104	17-118	22-43	22-55	23-28	23-40
	26-9	26-17	27-44	27-48	27-52	28-72	29-85	29-99	29-113	29-116	29-127	29-130	30-21	33-39
	35-12*													
ODTPR	28-17*	30-45	33-73											
OFLOF	6-10*	16-79	17-18*	18-39*	29-63*	40-29*								
ONCE	18-115*	18-135	18-148	18-153*	18-158*	23-49*	40-30*							
OSATE	8-68	38-10*												
OSOTE	8-39	38-9*												
OVFLM	16-81	37-54*												

P0	1-320	17 65												
P1	1-310													
P2	1 300													
P3	1-290													
P4	1-280													
P5	1-270													
P6	1-260													
P7	1-250	3-12	3-16	3-20	3-89	5-5								
PASCNT	6-9*	16-65*	16-76	17-16*	17-145*	18-37*	18-166*	41-150						
PAT	7-11*	7-13	7-23	7-25*	7-26*	41-160								
PCONT	3-28*	3-43*	3-53*	5-17*	5-19*	6-15*	6-18*	17-23*	17-25*	17-56*	17-59*	18-52*	18-54*	18-74*
	18-76*	28-88	28-90	30-24*	30-26*	30-57*	33-48	33-51	33-66	33-68	41-170			
PLDERR	17-113	38-390												
PLFFE	17-79	38-360												
PLRCTO	17-99	38-380												
PLTM	17-19	37-550												
PLTXTO	17-89	38-370												
PNCFLG	25-5*	25-10*	25-16*	25-22*	25-28*	25-31	40-310							
PNT	36-19	36-21	36-270											
PNT0	17-141	17-1440												
PNT1	17-1450													
PNTCO	34-6	34-90												
PNTCNF	30-61	33-58	34-50											
PNTCX	34-8	34-100												
PNTEND	17-124	17-132	17-1400											
PNTXT	36-13	36-170												
PNTRTN	17-143	17-147	17-1530											
POK	17-9	17-140												
PORO	24-240	24-27												
PORCO	24-25	24-280												
POR1	24-31	24-340												
PORCN	24-430	24-48												
PORCNF	19-9	19-12	19-15	19-18	24-120									
PORLD	24-39	24-410												
PORN	19-8*	19-11*	19-14*	19-17*	24-21	24-49	25-11*	25-17*	25-23*	25-29*	26-8	41-180		
PORT	17-29*	17-37*	17-46	17-48	17-83	17-93	17-103	17-117	17-125	17-127*	17-129	17-131	17-133*	17-135
	17-137	41-190												
PORTOM	16-17	37-470												
PORT1M	16-29	37-480												
PORT2M	16-37	37-490												
PORT3M	16-49	37-500												
PORTLP	5-31	17-70												
PORTMS	17-82	17-92	17-102	17-116	26-7	37-620								
PORTN	17-21	37-560												
FORXT	24-40	24-490												
PROFLT	3-27	3-42	3-52	29-820										
PREMO	26-100	26-23	26-32											
PREM1	26-290	26-31												
PREML	26-21	26-330												
PRI0	3-68*	12-24	41-200											
PRLC	17-80	17-11												
PRMT1	3-32	3-350												
PRMT2	3-390	3-43	3-48											
PRMT3	3-46	3-490	3-53	3-58	3-62									
PRMT4	3-56	3-590	33-68											
PRMT5	3-60	3-630												

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 5 7
 CROSS REFERENCE TABLE (CREF V04.00)

PRNREM	25-12	25-18	25-24	25-30	26-70			
PRINTM	17-151	18-172	30-670					
PROMT	3-250	3-28	3-34	29-38				
PRTCF	18-143	19-50	19-20					
PS	1-80							
PST0	17-210	17-23	17-36					
PST1	17-27	17-320						
PST2	17-34	17-370						
PST2A	17-30	17-380						
PST3	17-510	17-54						
PST4	17-560							
PST5	17-650	17-85	17-95	17-105	17-119	17-138	17-154	
PST6	17-680	17-71						
PST60	17-69	17-720						
PST7	17-74	17-770						
PST7S	17-81	17-850						
PST8	17-78	17-870						
PST80	17-88	17-970						
PST80S	17-101	17-1050						
PST8S	17-91	17-950						
PST9	17-98	17-1070						
PST9S	17-115	17-1190						
PSTE	17-32	17-350						
PSTS	17-550	17-56	17-61					
RADIX	36-3*	36-6	36-8	36-540				
RECON	17-20	18-49	37-430					
REGMG	23-33	37-700						
REGRES	29-150	35-16	35-25	35-34	35-43	35-52		
REGSAV	29-80	35-12	35-21	35-30	35-39	35-48		
REMG	23-24	37-680						
REMG	41-210							
REMG	20-8*	20-21*	20-33*	20-45*	22-14	27-14	41-220	
REMSG	22-40	23-25	27-41	37-630				
REMSG	41-240							
REMSG	23-29	37-690						
REMSG	41-230							
REPO	25-9	25-130						
REP1	25-15	25-190						
REP2	25-21	25-250						
REP20	25-27	25-310						
REP3	25-32	25-340						
REPORT	18-150	25-40	34-7					
RESTR	3-6	3-850	29-102					
RJFLG	35-13*	35-22*	35-31*	35-40*	35-49*	36-20	36-26*	36-530
RMB	18-71	37-750						
RQSPCL	9-22	38-120						
RSPENF	15-22	38-330						
RSPESF	14-36	38-280						
RSSPCL	9-38	38-130						
SAFE	5-12*	30-55	33-33	33-37*	33-52*	33-56	33-70	40-320
SAVEC	28-22*	41-250						
SBAK	29-54	29-560						
SCA1	23-7	23-140	23-53					
SCA2	23-21	23-240						
SCA2A	23-32	23-350						
SCA2B	23-36	23-390						

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 5 8
 CROSS REFERENCE TABLE (CREF V04.00)

SCA2C	23-34	23-42*												
SCA2D	23-38	23-44*												
SCA2E	23-41	23-43	23-45	23-47*										
SCA2F	23-48	23-51*												
SCA3	23-18	23-54*												
SCALM	18-125	22-15	22-21	23-6*	24-22	24-26	27-19	27-24						
SCART	23-55	23-58*												
SCONT	29-58	29-61*												
SCORTM	29-62	29-64*												
SCPAD	8-25	8-42	8-71	8-88	9-25	9-41	37-44*							
SCPRTN	6-32	6-42	6-49	7-10	7-22	8-28	8-45	8-74	8-91	9-28	9-44	10-11	10-40	11-9
	11-16	11-26	11-36	12-13	12-17	12-32	13-14	13-23	13-31	13-51	14-30	14-37	14-44	14-55
	14-62	14-69	15-23	15-30	15-41	17-85	17-95	17-105	17-119	22-30	22-44	22-56	27-32	27-53
	29-52*													
SECS	4-9*	4-10	4-12*	5-9*	30-76	40-33*								
SKP1	20-6	20-8*	20-15											
SKP1A	20-10	20-13*												
SKP1B	20-12	20-14*												
SKP2	20-7	20-17*												
SKP3	20-19	20-21*	20-28											
SKP3A	20-23	20-26*												
SKP3B	20-25	20-27*												
SKP4	20-20	20-29*												
SKP5	20-31	20-33*	20-40											
SKP5A	20-35	20-38*												
SKP5B	20-37	20-39*												
SKP6	20-32	20-41*												
SKP7	20-43	20-45*	20-52											
SKP7A	20-47	20-50*												
SKP7B	20-49	20-51*												
SKP8	20-44	20-53*												
SKP02	18-142	18-161*												
SKPX0	18-162	18-165*												
SKPX1	18-164	18-168	18-174*											
SLFL	28-39	28-76	33-22*	33-81*	40-34*									
SLOW	18-114	37-59*												
SPAR	6-51*	6-56*	7-5*	7-7	7-15*	7-16	8-5*	8-8*	8-10*	8-11	8-13*	8-16*	8-26	8-29
	8-31*	8-34*	8-43	8-46	8-48*	8-51*	8-54*	8-56*	8-57	8-59*	8-62*	8-72	8-75	8-77*
	8-81*	8-89	8-92	8-94*	9-5*	9-7	9-9*	9-11*	9-13	9-15*	9-17*	9-26	9-29	9-31*
	9-33*	9-42	9-45	9-47*	10-18*	10-20*	10-22*	11-18*	11-28*	13-17*	13-33	13-35*	13-43*	14-10*
	14-12*	14-14*	14-16*	14-18*	14-20*	14-31*	14-38*	14-56*	14-63*	14-71*	14-73*	15-6*	15-8*	15-10*
	15-12*	15-17*	15-24*	15-35*	17-39*	17-41*	17-43*	17-45*	17-47*	17-51*	17-72*	17-107*	17-108*	17-110*
	17-111*	17-128*	17-130*	17-134*	17-136*	21-11*	21-16*	21-18*	21-20*	21-23*	22-7*	22-9*	22-11*	22-13*
	22-24*	22-32*	22-41*	22-46*	22-53*	23-19*	23-26*	23-30*	24-14*	24-16*	24-18*	24-20*	24-29*	24-34*
	24-42*	24-44*	24-46*	27-7*	27-9*	27-11*	27-13*	27-15*	27-26*	27-33*	27-42*	27-46*	27-50*	28-44*
	28-58*	29-72*	41-26*											
SPAVFE	11-35	38-19*												
SPAVIC	13-50	38-26*												
SPAVME	11-25	38-18*												
SPDR	6-53	8-7*	8-9*	8-19	8-36	8-53*	8-55*	8-65	8-82	9-6*	9-12*	9-19	9-35	10-19*
	10-21*	10-23*	11-19	11-22*	11-23	11-29	11-32*	11-33	13-20	13-44	13-47*	13-48	14-11*	14-13*
	14-15*	14-17*	14-19*	14-21*	14-33	14-40	14-58	14-65	14-72	14-74	15-7*	15-9*	15-11*	15-13*
	15-18	15-26	15-37	17-40*	17-42*	17-44*	17-46*	17-48*	17-52*	17-73	17-77	17-87	17-97	17-108
	17-109	17-112	17-129*	17-131*	17-135*	17-137*	21-13*	21-17*	21-19*	21-21*	21-24*	22-8*	22-10*	22-12*
	22-14*	22-26	22-34	22-42	22-47	22-54	23-20	23-27	23-31	23-35	23-39	24-15*	24-17*	24-19*
	24-21*	24-30	24-35	24-43	24-45	27-8*	27-10*	27-12*	27-14*	27-16*	27-28	27-35	27-43	27-47

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE S-9
 CROSS REFERENCE TABLE (CREF V04.00)

	27-51	28-45	28-59	28-62	28-64*	29-74*	41-27#							
SPRCLR	7-9	38-6#												
SPROAT	7-21	38-7#												
SR	3-21*	3-22	6-31	6-41	6-48	7-9	7-21	8-22	8-23	8-39	8-40	8-68	8-69	8-85
	8-86	9-22	9-23	9-38	9-39	10-10	10-35	11-8	11-15	11-25	11-35	12-11	12-16	12-31
	13-13	13-22	13-30	13-50	14-29	14-36	14-43	14-54	14-61	14-68	15-22	15-29	15-40	16-62
	16-66	17-12	17-79	17-80	17-89	17-90	17-99	17-100	17-113	17-114	17-142	17-146	18-46	18-163
	18-167	22-29	22-37	22-38	22-49	22-50	23-22	24-32	27-31	27-38	27-39	29-30*	29-53	29-57
	30-20	30-23	30-27*	41-28#										
SRTST	3-19	29-30#												
SSWR	1-10#	29-30												
ST0	6-25#	6-32	6-42	6-49	16-72									
ST1	6-28	6-33#												
ST10	8-47	8-51#												
ST100	8-53#	8-61												
ST101	8-58	8-62#												
ST110	8-64#	8-74	8-79											
ST110S	8-70	8-74#												
ST111	8-67	8-75#												
ST112	8-76	8-80#												
ST120	8-82#	8-91	8-95											
ST120S	8-87	8-91#												
ST121	8-84	8-92#												
ST13	8-93	9-5#	9-28	9-44										
ST130	9-6#	9-10												
ST131	9-14	9-17#												
ST131A	9-8	9-11#												
ST131B	9-12#	9-16												
ST132	9-19#	9-32												
ST132S	9-24	9-28#												
ST133	9-21	9-29#												
ST134	9-30	9-33#												
ST135	9-35#	9-48												
ST135S	9-40	9-44#												
ST136	9-37	9-45#												
ST14	9-46	10-5#	10-11											
ST15	10-9	10-18#	10 40											
ST150	10-37#	10-38												
ST16	10-33	11-3#	11-9											
ST160	11-7	11-10#	11-16											
ST161	11-14	11-17#	11-26											
ST162	11-24	11-27#	11-36											
ST17	11-34	12-3#	12-17											
ST170	12-7#	12-13	12-18											
ST170R	12-14#	12-19												
ST18	12-28	12-33	13-4#	13-14										
ST180	13-12	13-15#	13-16	13-23										
ST181	13-20#	13-36												
ST182	13-21	13-24#	13-31											
ST183	13-29	13-32#												
ST19	13-34	13-42#	13-51											
ST1A	6-34#	6-40												
ST2	6-38	6-43#												
ST20	13-49	14-8#	14-30	14-37	14-44									
ST200	14-22#													
ST201	14-24#	14-28												

CZCMJCO CMR(V) 11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE 5 11
 CROSS REFERENCE TABLE (CREF V04.00)

TSTRSK	5-33	5 39#												
TSTSEL	5-15	37-23#												
TTB	36-34*	41-46#												
TTO	16-13	23-9	23-10	23-11	23-12	26-14	26-19	26-26	26-29	26-34	28-35	28-56	28-74	29-83
	29-87	29-89	30-38	30-71	30-75	30-79	31-22	32-13	32-24	32-36	32-38	33-82	33-87	35-58
	36-23	36-34#	36-41	36-44										
TTOLF	36-38	36-40#												
TTOLP	36-35#	36-36												
TTS	36-35	41-47#												
TWOSP	18-72	28-61	30-22	33-40	37-19#									
TYPCR	6-14	17-55	37-57#											
TYPCTP	30-28	37-22#												
TYPOUT	3-24	3-25	3-33	3-40	3-47	3-50	3-57	3-61	5-15	5-41	5-43	6-12	6-13	6-14
	8-25	8-42	8-71	8-88	9-25	9-41	16-10	16-16	16-17	16-28	16-29	16-36	16-37	16-48
	16-49	16-56	16-75	16-78	16-81	17-19	17-20	17-21	17-35	17-55	17-82	17-92	17-102	17-116
	18-48	18-49	18-50	18-59	18-67	18-71	18-72	18-83	18-114	18-154	22-40	22-52	23-24	23-25
	23-29	23-33	23-37	23-50	25-4	25-33	26-7	27-41	27-45	27-49	28-23	28-37	28-61	29-37
	29-96	29-111	29-114	29-118	29-125	29-128	30-19	30-22	30-28	30-67	31-15#	33-36	33-40	33-45
	34-9													
USOFE1	14-43	38-29#												
USOFE2	14-61	38-31#												
USOFE3	15-29	38-34#												
USOFE4	15-40	38-35#												
USORM	27-49	37-66#												
VECTOR	3-41	3-49*	12-3*	12-7*	12-22*	29-75	41-40#							
VERFLG	6-7*	16-4	16-7*	41-34#										
VERSM	16-10	37-45#												
VERSP	6-52	13-18	40-10#											
VERSUN	13-19	16-8	40-14#											
VIDER	13-30	38-25#												
VISF	13-22	38-24#												
WDAT	29-114	29-145#												
WDSDB	29-125	29-146#												
WDMAS	29-128	29-147#												
WORD	8-6*	8-7	8-14*	8-17*	8-18	8-32*	8-52*	8-53	8-60*	8-63*	8-64	8-78*	11-19*	11-20*
	11-21*	11-22	11-23	11-29*	11-30*	11-31*	11-32	11-33	13-44*	13-45*	13-46*	13-47	13-48	16-18*
	16-19*	16-20*	16-21*	16-22*	16-23*	16-25*	16-26	16-30*	16-31*	16-33*	16-34	16-38*	16-39*	16-40*
	16-41*	16-42*	16-43*	16-45*	16-46	16-50*	16-51*	16-53*	16-54	41-35#				
WPODI	12-31	38-22#												

PC	1-21*	3-23*	3-24*	3-25*	3-27*	3-29*	3-33*	3-40*	3-42*	3-44*	3-47*	3-50*	3-52*	3-54*
	3-57*	3-61*	3-69*	3-93*	5-14*	5-15*	5-18*	5-41*	5-43*	6-12*	6-13*	6-14*	6-17*	6-31*
	6-41*	6-48*	7-9*	7-21*	7-28*	8-22*	8-25*	8-27*	8-39*	8-42*	8-44*	8-68*	8-71*	8-73*
	8-85*	8-88*	8-90*	9-22*	9-25*	9-27*	9-38*	9-41*	9-43*	10-10*	10-35*	11-8*	11-15*	11-25*
	11-35*	12-11*	12-16*	12-31*	13-13*	13-22*	13-30*	13-50*	14-29*	14-36*	14-43*	14-54*	14-61*	14-68*
	15-22*	15-29*	15-40*	16-10*	16-13*	16-16*	16-17*	16-28*	16-29*	16-36*	16-37*	16-48*	16-49*	16-56*
	16-57*	16-68*	16-69*	16-70*	16-71*	16-75*	16-77*	16-78*	16-81*	16-84*	16-85*	17-12*	17-13*	17-19*
	17-20*	17-21*	17-24*	17-35*	17-55*	17-58*	17-70*	17-75*	17-79*	17-82*	17-84*	17-89*	17-92*	17-94*
	17-99*	17-102*	17-104*	17-113*	17-116*	17-118*	17-148*	17-151*	17-152*	17-153*	18-46*	18-47*	18-48*	18-49*
	18-50*	18-53*	18-59*	18-67*	18-70*	18-71*	18-72*	18-75*	18-83*	18-104*	18-114*	18-125*	18-126*	18-132*
	18-141*	18-143*	18-150*	18-154*	18-169*	18-172*	18-173*	18-174*	19-9*	19-12*	19-15*	19-18*	19-21*	20-11*
	20-13*	20-24*	20-26*	20-36*	20-38*	20-48*	20-50*	20-53*	21-31*	21-33*	22-15*	22-21*	22-29*	22-37*
	22-40*	22-43*	22-49*	22-52*	22-55*	22-59*	23-9*	23-10*	23-11*	23-12*	23-22*	23-23*	23-24*	23-25*
	23-28*	23-29*	23-33*	23-37*	23-40*	23-50*	23-58*	24-22*	24-26*	24-28*	24-32*	24-33*	24-54*	25-4*
	25-12*	25-18*	25-24*	25-30*	25-33*	25-34*	26-7*	26-9*	26-12*	26-14*	26-17*	26-19*	26-26*	26-29*
	26-34*	26-36*	27-19*	27-24*	27-31*	27-38*	27-41*	27-44*	27-45*	27-48*	27-49*	27-52*	27-55*	28-23*
	28-26*	28-33*	28-35*	28-37*	28-52*	28-56*	28-60*	28-61*	28-63*	28-72*	28-74*	28-91*	29-37*	29-45*
	29-46*	29-48*	29-52*	29-55*	29-77*	29-83*	29-85*	29-87*	29-89*	29-90*	29-96*	29-99*	29-100*	29-111*
	29-113*	29-114*	29-116*	29-118*	29-119*	29-124*	29-125*	29-127*	29-128*	29-130*	29-131*	30-19*	30-21*	30-22*
	30-25*	30-28*	30-38*	30-58*	30-61*	30-62*	30-67*	30-69*	30-71*	30-73*	30-75*	30-77*	30-79*	30-81*
	30-82*	31-22*	31-26*	32-12*	32-13*	32-24*	32-36*	32-38*	32-52*	32-55*	33-36*	33-39*	33-40*	33-42*
	33-45*	33-58*	33-82*	33-87*	33-93*	34-7*	34-9*	34-10*	35-15*	35-17*	35-24*	35-26*	35-33*	35-35*
	35-42*	35-44*	35-51*	35-53*	35-58*	35-61*	36-15*	36-23*	36-39*	36-41*	36-44*	36-48*		
RO	1-14*	3-24*	3-25*	3-33*	3-40*	3-47*	3-50*	3-57*	3-61*	5-15*	5-41*	5-43*	6-12*	6-13*
	6-14*	6-31*	6-41*	6-48*	7-9*	7-21*	8-22*	8-25*	8-26*	8-39*	8-42*	8-43*	8-68*	8-71*
	8-72*	8-85*	8-88*	8-89*	9-22*	9-25*	9-26*	9-38*	9-41*	9-42*	10-10*	10-35*	11-8*	11-15*
	11-25*	11-35*	12-11*	12-16*	12-31*	13-13*	13-22*	13-30*	13-50*	14-29*	14-36*	14-43*	14-54*	14-61*
	14-68*	14-70*	14-72*	14-74*	15-22*	15-29*	15-40*	16-10*	16-12*	16-16*	16-17*	16-27*	16-29*	16-35*
	16-37*	16-47*	16-49*	16-55*	16-75*	16-76*	16-78*	16-81*	16-83*	17-12*	17-19*	17-20*	17-21*	17-35*
	17-55*	17-79*	17-82*	17-83*	17-89*	17-92*	17-93*	17-99*	17-102*	17-103*	17-113*	17-116*	17-117*	18-46*
	18-48*	18-49*	18-50*	18-59*	18-67*	18-68*	18-69*	18-71*	18-72*	18-77*	18-78*	18-79*	18-83*	18-114*
	18-154*	21-14*	21-15*	21-17*	22-29*	22-37*	22-40*	22-42*	22-49*	22-52*	22-54*	23-8*	23-22*	23-24*
	23-25*	23-27*	23-29*	23-33*	23-37*	23-39*	23-50*	24-32*	24-35*	24-36*	24-37*	24-38*	24-41*	24-52*
	25-4*	25-33*	26-7*	26-8*	26-10*	26-11*	26-13*	26-15*	26-16*	26-18*	26-25*	26-28*	26-33*	27-31*
	27-38*	27-41*	27-43*	27-45*	27-47*	27-49*	27-51*	28-23*	28-32*	28-34*	28-37*	28-55*	28-59*	28-61*
	28-68*	28-69*	28-73*	29-12*	29-15*	29-16*	29-37*	29-56*	29-60*	29-69*	29-70*	29-71*	29-72*	29-73*
	29-74*	29-75*	29-76*	29-82*	29-84*	29-86*	29-88*	29-96*	29-98*	29-110*	29-111*	29-112*	29-114*	29-115*
	29-117*	29-125*	29-126*	29-128*	29-129*	30-11*	30-15*	30-16*	30-17*	30-19*	30-20*	30-22*	30-28*	30-31*
	30-32*	30-33*	30-35*	30-37*	30-39*	30-43*	30-47*	30-51*	30-59*	30-67*	30-68*	30-70*	30-72*	30-74*
	30-76*	30-78*	30-80*	31-15*	31-16*	31-17*	31-19*	31-21*	32-14*	32-17*	32-21*	32-23*	32-35*	32-37*
	32-41*	32-45*	33-19*	33-24*	33-25*	33-31*	33-36*	33-38*	33-40*	33-45*	33-54*	33-64*	33-74*	33-76*
	33-79*	33-84*	33-89*	34-9*	35-57*	36-6*	36-8*	36-11*	36-12*	36-22*	36-27*	36-28*	36-34*	36-37*
	36-40*	36-43*	36-47*											
R1	1-15*	6-52*	6-53*	13-18*	13-24*	13-32*	16-8*	16-12*	17-50*	17-52*	20-4*	20-5*	20-8*	20-17*
	20-18*	20-21*	20-29*	20-30*	20-33*	20-41*	20-42*	20-45*	21-9*	21-12*	21-24*	24-12*	24-38*	24-43*
	24-45*	25-7*	25-8*	25-13*	25-14*	25-19*	25-20*	25-25*	25-26*	26-10*	26-15*	29-11*	29-17*	32-9*
	32-17*	32-18*	32-19*	32-51*	32-54*	35-14*	35-23*	35-32*	35-41*	35-50*	36-3*	36-5*	36-9*	36-12*
R2	1-16*	13-19*	13-20*	13-25*	13-32*	16-9*	16-18*	16-30*	16-38*	16-50*	18-65*	18-66*	18-93*	27-6*
	27-16*	29-10*	29-18*	36-4*	36-14*	36-18*								
R3	1-17*	16-24*	16-26*	16-27*	16-32*	16-34*	16-35*	16-44*	16-46*	16-47*	16-52*	16-54*	16-55*	29-9*
	29-19*	36-17*	36-18*	36-24*										
R4	1-18*	29-8*	29-20*											
R5	1-19*	6-32*	6-42*	6-49*	7-10*	7-22*	8-28*	8-45*	8-74*	8-91*	9-28*	9-44*	10-11*	10-40*
	11-9*	11-16*	11-26*	11-36*	12-13*	12-17*	12-32*	13-14*	13-23*	13-31*	13-51*	14-30*	14-37*	14-44*
	14-55*	14-62*	14-69*	15-23*	15-30*	15-41*	17-85*	17-95*	17-105*	17-119*	22-30*	22-44*	22-56*	27-32*
	27-53*	29-13*	29-21*	29-56*	29-59*	29-64*	35-12*	35-16*	35-21*	35-25*	35-30*	35-34*	35-39*	35-43*

CZCMJCO CMR(V)-11 MOST EXERCISE MACRO V04.00 02:24:05 PAGE R-2
 CROSS REFERENCE TABLE (CREF V04.00)

SP	35-48*	35-52*												
	1-20*	3-4*	3-10*	3-12*	3-12*	3-89*	3-89*	5-5*	5-5*	12-4*	12-4*	12-15	12-15	12-19*
	12-24*	12-24*	12-29	12-29	17-65*	17-65*	18-36*	18-36*	28-19*	28-86	28-90*	29-8*	29-9*	29-10*
	29-11*	29-12*	29-15	29-16	29-17	29-18	29-19	29-20	29-36*	29-59	29-94	29-95*	29-101*	29-108
	29-110*	29-117	29-122	30-41*	30-49*	31-15*	31-16	31-23*	31-25	32-9*	32-10*	32-50	32-51	32-53
	32-54	33-27*	33-50*	33-51*	33-72*	33-83*	33-88*	33-92*	36-11*	36-27				

