

KDJ11-B

EEPROM USENG LANG LDR
COEEHA0

AH-FF31A-MC
1 OF 1 JUL 1985
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digital
MADE IN USA

Address	Hex	ASCII
0000	00 00 00 00	
0004	00 00 00 00	
0008	00 00 00 00	
000C	00 00 00 00	
0010	00 00 00 00	
0014	00 00 00 00	
0018	00 00 00 00	
001C	00 00 00 00	
0020	00 00 00 00	
0024	00 00 00 00	
0028	00 00 00 00	
002C	00 00 00 00	
0030	00 00 00 00	
0034	00 00 00 00	
0038	00 00 00 00	
003C	00 00 00 00	
0040	00 00 00 00	
0044	00 00 00 00	
0048	00 00 00 00	
004C	00 00 00 00	
0050	00 00 00 00	
0054	00 00 00 00	
0058	00 00 00 00	
005C	00 00 00 00	
0060	00 00 00 00	
0064	00 00 00 00	
0068	00 00 00 00	
006C	00 00 00 00	
0070	00 00 00 00	
0074	00 00 00 00	
0078	00 00 00 00	
007C	00 00 00 00	
0080	00 00 00 00	
0084	00 00 00 00	
0088	00 00 00 00	
008C	00 00 00 00	
0090	00 00 00 00	
0094	00 00 00 00	
0098	00 00 00 00	
009C	00 00 00 00	
00A0	00 00 00 00	
00A4	00 00 00 00	
00A8	00 00 00 00	
00AC	00 00 00 00	
00B0	00 00 00 00	
00B4	00 00 00 00	
00B8	00 00 00 00	
00BC	00 00 00 00	
00C0	00 00 00 00	
00C4	00 00 00 00	
00C8	00 00 00 00	
00CC	00 00 00 00	
00D0	00 00 00 00	
00D4	00 00 00 00	
00D8	00 00 00 00	
00DC	00 00 00 00	
00E0	00 00 00 00	
00E4	00 00 00 00	
00E8	00 00 00 00	
00EC	00 00 00 00	
00F0	00 00 00 00	
00F4	00 00 00 00	
00F8	00 00 00 00	
00FC	00 00 00 00	

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.REM &

IDENTIFICATION

PRODUCT CODE: AC-FF30A-MC
PRODUCT NAME: COEEHA0 EEPROM USENG LANG LDR
PRODUCT DATE: FEBRUARY, 1985
MAINTAINER: DIAGNOSTIC ENGINEERING

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1. PROGRAM ABSTRACT

The KDJ11-B is a PDP-11 CPU that incorporates the J11 chip set as the heart of the processor. It is a quad height Q22 bus module. The KDJ11-B has two on-board ROM's. One of them, the 16-bit addressable ROM, contains the self-test and the boot codes. The other ROM, the 8-bit addressable one, contains the base area with hardware selection parameters, optional bootstraps, optional UFD (User Friendly Diagnostic) system description area, and optional foreign language text.

On units to be shipped to non-English speaking countries, a dummy or "null" language is loaded into the EEPROM. The purpose of this is to disable English language error messages when the system is first installed. If and when the system passes its internal self tests, the user will be instructed to run a UFD (User Friendly Diagnostics) package which will be part of a "country kit" for each separate language. The UFD package will use the native language for the particular country and, in addition, will load diagnostic and error messages in the native language into the EEPROM, so each subsequent power-up or reboot will have diagnostic and error messages in the user's own language.

The purpose of this program is to select the diagnostic/boot ROM messages rather than any EEPROM language area-based messages. It will delete any language in the EEPROM to free up space but will leave the UFD (user friendly diagnostics) area intact. If the program detects an error while modifying the EEPROM setup area, the program will attempt to restore the setup area to its previous state. If the program detects an error while updating the UFD area in the EEPROM, a warning message will be issued, stating that the UFD area has been corrupted.

2. SYSTEM REQUIREMENTS

Hardware Requirements

To run successfully this utility needs:

1. KDJ11-B CPU module
2. console terminal
3. at least 28K of memory

3. LOADING AND STARTING PROCEDURES

To start-up this program:

1. Boot XXDP+
2. Type "R NAME", where NAME is the name of the BIN or BIC file for this program.

The starting address of the program is 1000.

Note: if trying to restart the program in an arbitrary place after

126	HALT on Break	the following registers should be set up:
127	17777572=0	to disable memmory management
128	17777520=1000	to clear diagnostic mode (bit 8), but still save
129		HALT on Break
130	17777746=400	to flush the cache

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4. SPECIAL ENVIRONMENTS

The program is not APT compatible.

5. PROGRAM OPTIONS

None.

6. EXECUTION TIMES

The program runs in under 10 seconds.

7. ERROR INFORMATION

7.1 DEFECTIVE BYTE IN EEPROM

After each write, the Byte which should have been written is compared to the Byte in the proper location, and if it is not correct, the following error message is displayed:

EEPROM write error, PCR page n, address mmmmm.
Data written qq, data read rrr.

where n is the EEPROM page selected by the Page Control Register (PCR), mmmmm is the physical address of the bad byte in question, qq is the byte value that was written out to the address and rrr what was read back in after the write. (should be identical to qq)

7.2 PROCESSOR NOT KDJ11-B

The program checks the type of CPU it is running on, which must be a KDJ11-B processor (MFPT returns 5 in r0). If not, the following message is printed:

Language area not supported by this processor.

7.3 CHECKSUM ERROR IN SETUP AREA

The checksum in the setup area is checked to see if it contains a valid checksum. Also, bytes 6 and 103 (addresses 17765022 and 17765314, respectively) are checked to see if they contain 0 and 252 octal, respectively. If any of these conditions is not met, the following message is printed:

EEPROM checksum error in setup area.

No attempt is made to correct a checksum error.

7.4 DIFFERENCES BETWEEN UFD "QUIET" MODE AND "STANDALONE" MODE

When this program is run in UFD "Quiet" mode (which will usually be the case) none of the error messages will appear. If no error is detected, no messages whatsoever are printed. If an error is detected when writing the setup area, the program will attempt to restore the setup area to the state it was in when the program was started. If an error was detected when the UFD area is being moved, the following message is printed:

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WARNING: UFD area has been corrupted.

8. EXAMPLES

After booting XXDP+ and running the program, no message should appear, just the XXDP dot prompt (.)

If a problem occurred, one of the messages in section 7 should appear.

9. PROGRAM DESCRIPTION

This program consists of a body of code which checks certain conditions such as correct processor type, clears the EEPROM language bit in the EEPROM, and frees up any language area in the EEPROM. If there was an unsuccessful attempt to write any of the bytes in the EEPROM, one of the message in section 7 appears. If run under UFD "Quiet" mode, no message is printed if the program was successful, otherwise the messages in 7.4 appear. In both cases, the XXDP prompt appears.

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211          .TITLE COEEHA EEPROM USENG LANG LDR
212
213          .SBTTL PROGRAM CONSTANTS
214 000000   .ENABL ABS
215          .NLIST MD,CND
216          .LIST ME
217
218          177520 BCSR = 177520
219          177522 PCR = 177522
220          177522 PCRLB = 177522
221          165000 E2PROM = 165000
222          165316 E2PAR = E2PROM+316 ;E2PROM PARITY BYTE
223          165006 E2LLB = E2PROM+6 ;LOCAL LANGUAGE BIT IN E2PROM
224          166000 ENDE2R = E2PROM+1000 ;LAST ADDRESS OF E2PROM+2
225          173002 RMVTST = 173002 ;WORD TO TEST ROM VERSION NUMBER
226          025370 DELAY = 11000.
227          000140 LNGHDR = 140 ;I.D. OF A LANGUAGE AREA
228          000040 UFDHDR = 040 ;I.D. OF A UFD BLOCK
229          000003 RETRY = 3 ;NUMBER OF ATTEMPTS TO WRITE A
230                                     ;BYTE IN E2PROM BEFORE GIVING UP
231          000004 MAXERR = 4 ;NO. OF ERRORS ALLOWED IN LOCAL
232                                     ;LANGUAGE TEXT BEFORE QUITTING
233          177524 BDR = 177524
234          000015 CR = 15
235          000012 LF = 12
236          000200 BIT7 = 200
237          000100 BIT6 = 100
238          000011 tab = 11
239          000010 backsp = 10
240          000040 space = 40
241          000033 esc = 33
242
243
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CHECK FOR CERTAIN EXCEPTIONS FIRST

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287 .SBTTL CHECK FOR CERTAIN EXCEPTIONS FIRST
288
289 001000 . =1000
290
291 001000 005037 177522 START: CLR @#PCR ;SELECT PAGE 0 OF EEPROM
292 001004 013746 177520 MOV @#BCSR,-(SP) ;SAVE OLD BCSR VALUE
293 001010 112737 000060 177520 MOVB #60,@#BCSR ;WRITE ENABLE THE E2PROM & ENABLE ROM
294
295 001016 000007 MFPT ;GET PROCESSOR TYPE
296 001020 020027 000005 CMP R0,#5 ;CHECK TO SEE IF ORION
297 001024 001404 BEQ 1$ ;YES - CONTINUE
298 001026 .TYPMSG #FMSG2 ;FIELD-SERVICE MESSAGE
.NARG NARGS
.NTYPE NTYPE,#FMSG2
MOV #FMSG2,R0
EMT 3
299 001034 000426 BR 203$
300
301 001036 012700 165000 1$: MOV #E2PROM,R0 ;STARTING ADDRESS TO CHECKSUM
302 001042 005001 CLR R1 ;INITIALIZE CHECKSUM
303 001044 012703 000151 MOV #105.,R3 ;NO. OF BYTES TO CKSUM
304 001050 012005 201$: MOV (R0)+,R5 ;GET A BYTE
305 001052 042705 177400 BIC #177400,R5 ;NO BUS NOISE, THANK YOU.
306 001056 060501 ADD R5,R1 ;ACCUMULATE CHECKSUM
307 001060 077305 SOB R3,201$ ;CONTINUE TILL DONE
308 001062 105701 TSTB R1 ;IS CKSUM 0?
309 001064 001007 BNE 202$ ;NO, ERROR
310 001066 105737 165022 TSTB @#E2PROM+22 ;BYTE TO TEST FOR VALID ROM, SHOULD BE 0
311 001072 001004 BNE 202$ ;NO, ERROR
312 001074 123727 165314 000252 CMPB @#E2PROM+314,#252 ;BYTE TO TEST FOR VALID ROM
313 001102 001404 BEQ USETUP ;GO TO NEXT CHECK IF OK
314 001104 2 2$: .TYPMSG #FMSG4 ;FIELD SERVICE MESSAGE
.NARG NARGS
.NTYPE NTYPE,#FMSG4
MOV #FMSG4,R0
EMT 3
001104 012700 002350
001110 104003
315 001112 000573 203$: BR EXIT ;QUIT
316
317 .SBTTL CLEAR LANGUAGE BIT AND UPDATE CKSUM
318
319 001114 012700 165006 USETUP: MOV #E2LLB,R0 ;ADDRESS OF LANG. BIT
320 001120 111005 MOVB (R0),R5 ;GET BYTE WHERE LANGUAGE BIT EXISTS
321 001122 002032 BGE LANG ;IF ALREADY CLEAR, NO UPDATING IS NECESSARY
322 001124 042705 000200 BIC #BIT7,R5 ;CLEAR LANGUAGE BIT
323 001130 004767 000460 CALL WRBYTE ;WRITE IT BACK
324 001134 001405 BEQ 1$ ;WRITE WENT OK
325 001136 052705 000200 BIS #BIT7,R5 ;PUT THINGS BACK THE WAY WE FOUND THEM
326 001142 004767 000446 CALL WRBYTE ;
327 001146 000555 BR EXIT ;GIVE UP
328 001150 012700 165316 1$: MOV #E2PAR,R0 ;ADDRESS OF PARITY BYTE
329 001154 111005 MOVB (R0),R5 ;GET PARITY BYTE
330 001156 162705 000200 SUB #BIT7,R5 ;UPDATE PARITY
331 001162 004767 000426 CALL WRBYTE ;WRITE IT BACK
332 001166 001410 BEQ LANG ;IF ALL WENT WELL
333 001170 062705 000200 ADD #BIT7,R5 ;TRY TO PUT EVERYTHING BACK
334 001174 004767 000414 CALL WRBYTE ;THE WAY WE FOUND IT
335 001200 152737 000200 165006 BISB #BIT7,@#E2LLB ;RESTORE LANGUAGE BIT

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CLEAR LANGUAGE BIT AND UPDATE CKSUM

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336 001206 000535          BR      EXIT
337
338          .SBTTL  CHECK FOR LANGUAGE
339
340 001210 012700 165776  LANG:  MOV    #ENDE2R-2,R0    ;LAST ADDRESS (CKSUM) OF E2PROM
341 001214 112737 000016 177522  MOVB   #16,#PCRLB    ;SELECT LAST PAGE
342 001222 012701 000005          MOV    #5,R1         ;NO. OF BYTES IN HEADER TO CHECKSUM
343 001226 010005          MOV    R0,R5         ;SAVE ADDRESS
344 001230 005003          CLR    R3            ;
345 001232 111004          4$:  MOVB   (R0),R4       ;GET A BYTE
346 001234 060403          ADD    R4,R3         ;ACCUMULATE CHECKSUM
347 001236 005740          TST   -(R0)         ;CORRECT ADDRESS
348 001240 077104          SOB   R1,4$         ;LOOP FOR 5 BYTES
349 001242 105703          TSTB  R3            ;IF NOT ZERO, NO LANGUAGE LOADED
350 001244 001116          BNE   EXIT          ;NON-EXISTANT OR CORRUPTED LANGUAGE  SKIP
351
352 001246 014504          MOV    -(R5),R4     ;HIGH BYTE OF BYTE COUNT
353 001250 014546          MOV    -(R5),-(SP)  ;LOW BYTE OF BYTE COUNT
354 001252 110466 000001          MOVB   R4,1(SP)     ;SET UPPER BYTES OF SIZE
355 001256 042704 177437          BIC    #177437,R4   ;EXTRACT ID CODE
356 001262 012601          MOV    (SP)+,R1     ;GET SIZE BACK
357 001264 042701 160000          BIC    #160000,R1   ;R1 NOW CONTAINS SIZE OF BLOCK IN BYTES
358 001270 062701 000005          ADD    #5,R1        ;ADD BYTE COUNT FOR HEADER BLOCK
359 001274 120427 000140          CMPB  R4,#LNGHDR   ;IS THIS A LANGUAGE HEADER?
360 001300 001100          BNE   EXIT          ;NO - QUIT
361
362          ;IF LAST BLOCK IS NOT LANGUAGE IT IS EITHER A UFD BLOCK OR UNUSED.  IF IT IS
363          ;UFD, IT IS IN CORRECT POSITION.  IF UNUSED, IT CAN BE IGNORED.  IN EITHER CASE,
364          ;NO ACTION IS NECESSARY.
365
366 001302 010146          MOV    R1,-(SP)     ;SAVE SIZE FOR NOW
367 001304 062701 000005          ADD    #5,R1        ;ADD SIZE OF (POSSIBLE) UFD HEADER
368 001310 004767 000460          CALL  ROMADR        ;SET UP PCR AND R0
369 001314 005003          CLR    R3           ;INITIALIZE CKSUM
370 001316 004767 000424          CALL  REAROM        ;GET A BYTE
371 001322 004767 000420          CALL  REAROM        ;GET A BYTE
372 001326 004767 000414          CALL  REAROM        ;GET A BYTE
373 001332 010546          MOV    R5,-(SP)     ;SAVE LOW BYTE OF SIZE FOR LATER
374 001334 004767 000406          CALL  REAROM        ;GET A BYTE
375 001340 110566 000001          MOVB   R5,1(SP)     ;SAVE HIGH BYTE OF SIZE AND ID
376 001344 004767 000376          CALL  REAROM        ;GET A BYTE
377 001350 116600 000001          MOVB   1(SP),R0     ;GET I.D.
378 001354 012601          MOV    (SP)+,R1     ;GET SIZE
379 001356 105703          TSTB  R3            ;SEE IF VALID CKSUM
380 001360 001005          BNE   1$            ;NO - WE HAVE LANGUAGE ONLY.
381
382 001362 042700 177437          BIC    #177437,R0   ;GET ID ONLY
383 001366 120027 000040          CMPB  R0,#UFDHDR   ;IS THIS A UFD BLOCK?
384 001372 001413          BEQ   2$            ;YES, CONTINUE.
385
386          ;IF WE GET HERE, WE HAVE A LANGUAGE ONLY AND NO UFD.  WE CLOBBER
387          ;THE LANGUAGE TO MAKE ROOM FOR EEPROM BOOTS, ETC.
388
389 001374 005726          1$:  TST   (SP)+         ;CORRECT STACK
390 001376 112737 000016 177522  MOVB   #16,#PCRLB   ;SELECT LAST PAGE
391 001404 012700 165774          MOV    #165774,R0  ;ADDRESS OF LANGUAGE I.D.
392 001410 112705 000377          MOVB   #377,R5     ;BAD I.D.

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CHECK FOR LANGUAGE

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393 001414 004767 000174          CALL  WRBYTE          ;GO CLOBBER LANGUAGE AREA TO FREE SPACE
394 001420 000430          BR      EXIT
395
396          ;WE HAVE BOTH A LANGUAGE AREA AND A UFD BLOCK.  SAVE THE UFD BLOCK.
397
398 001422 042701 160000      2$:   BIC      #160000,R1      ;GET RID OF ID
399 001426 062701 000005      ADD      #5,R1           ;SIZE OF HEADER
400 001432 010104          MOV      R1,R4          ;BYTE COUNT TO MOVE
401 001434 010167 000420      MOV      R1,UFDISZ      ;SAVE UFD SIZE
402 001440 062601          ADD      (SP)+,R1       ;ADD SIZE OF LANGUAGE AREA
403 001442 012702 002417      MOV      #BUFF,R2      ;MEMORY ADDRESS TO SAVE TO
404 001446 004767 000114      CALL    MOVROM         ;SAVE UFD AREA
405 001452 001013          BNE     EXIT           ;IT IS BAD, QUIT.
406
407          ;WRITE UFD BLOCK
408
409 001454 016701 000400      MOV      UFDISZ,R1      ;GET THE LENGTH OF THE UFD
410 001460 001410          BEQ     EXIT           ;NO UFD AREA - SKIP
411 001462 004767 000306      JSR     PC,ROMADR      ;COMPUTE E2PROM PAGE AND ADDR
412 001466 012702 002417      MOV      #BUFF,R2      ;ADDRESS OF BEGINNING OF UFD AREA
413 001472 112205          35$:  MOVB    (R2)+,R5       ;GET SOME DATA
414 001474 004767 000020      CALL    E2WRTT        ;GO WRITE IT
415 001500 077104          SOB     R1,35$        ;FINISHED UFD?
416          ;YES-EXIT
417
418 001502 142716 000060      EXIT:  BICB   #60,(SP)  ;BE SURE ROM IS DISABLED
419 001506 012637 177520      MOV     (SP)+,@#BCSR  ;RESTORE BCSR
420 001512 005037 177522      CLR    @#PCR         ;
421 001516 000207          RTS     PC
422
423 001520 004767 000070      E2WRT: CALL    WRBYTE    ;WRITE THE BYTE TO E2PROM
424 001524 001405          BEQ     3$           ;OK THIS TIME
425 001526          .FRCTYP #FMSG3      ;WARN USER OF CORRUPTED UFD AREA
          .NARG  NARGS
          .NTYPE NTYPE,#FMSG3
          MOV   #FMSG3,RO
          EMT   44
426 001526 012700 002276      TST    (SP)+        ;CORRECT STACK
427 001532 104044          BR     EXIT         ;QUIT
428
429 001540 062700 000002      3$:   ADD     #2,RO      ;INCREMENT LOCATION
430 001544 020027 166000      CMP    RO,#ENDE2R   ;FINISHED THIS PAGE ?
431 001550 001005          BNE    10$         ;NO-RETURN
432 001552 012700 165000      MOV    #E2PROM,RO  ;YES-RESET ADDRESS
433 001556 062737 000002 177522  ADD    #2,@#PCR     ;INCREMENT PCR TO NEXT PAGE
434 001564 000207          10$:  RETURN
435
436          .SBTTL  PROGRAM SUBROUTINES
437
438          ;MOVROM - MOVE BYTES FROM EEPROM TO MEMORY
439          ;ENTRY- R1 = STARTING ADDRESS IN EEPROM (# OF BYTES FROM END)
440          ;      R2 = ADDRESS OF MEMORY BUFFER
441          ;      R4 = # OF BYTES TO MOVE
442          ;EXIT  R1 - UNCHANGED
443          ;      R2 - UPDATED MEMORY ADDRESS
444          ;      R3 = (BYTE) 0 IF VALID CKSUM
445          ;      "Z" FLAG SET IF CKSUM VALID

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PROGRAM SUBROUTINES

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446
447 001566 010403
448 001570 004767 000200      MOVROM: MOV      R4,R3          ;SAVE R4
449 001574 010304              CALL     ROMADR          ;LOAD PCR AND R0 WITH LANGUAGE START AREA
450 001576 005003              MOV      R3,R4          ;RESTORE BYTE COUNT
451 001600 004767 000142      5$:   CLR      R3          ;INIT CHECKSUM
452 001604 110522              CALL     REAROM         ;GET A BYTE
453 001606 077404              MOV     R5,(R2)+        ;SAVE IT
454 001610 105703              SOB     R4,5$          ;LOOP TILL DONE
455 001612 000207              TSTB   R3              ;IS CHECKSUM GOOD?
456                          RETURN
457 001614 120510      WRBYTE: CMPB   R5,(R0)      ;IS THE NEW DATA DIFFERENT ?
458 001616 001452          BEQ     10$            ;NO-DO NOT WRITE OVER
459
460 001620 012703 000003      1$:   MOV      #RETRY,R3
461 001624 010510              MOV     R5,(R0)        ;WRITE A LOCATION
462 001626 012704 025370      MOV     #DELAY,R4      ;11 MS WAIT
463 001632 077401              SOB     R4, .          ;WASTE TIME
464 001634 120510              CMPB   R5,(R0)        ;SEE IF IT TOOK
465 001636 001442          BEQ     10$            ;YES, ALL OKAY
466 001640 077307              SOB     R3,1$         ;IF AT FIRST YOU DON'T SUCCEED...
467 001642 113704 177522      MOV     @#PCRLB,R4     ;PCR PAGE OF BAD BYTE
468 001646 106204          ASRB   R4              ;CONVERT TO PAGE #
469 001650 062704 000060      ADD     #'0,R4         ;CONVERT TO OCTAL
470 001654 110467 000237      MOV     R4,FMSG1A     ;STORE IT FOR PRINTING
471 001660 010046          MOV     R0,-(SP)      ;SAVE ROM ADDRESS
472 001662              .ITOA   ,#FMSG1B     ;CONVERT ROM ADDRESS TO OCTAL
473              .NARG   NARGS
474              .NARG   NARGS
475              .NARG   NARGS
476              .NARG   NARGS
477              .NARG   NARGS
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PROGRAM SUBROUTINES

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000001      .NARG  NARGS
000027      .NTYPE NTYPE,#FMSG1D
001734      MOV   #FMSG1D,R0
001740      EMT   3
481 001742  000244      CLZ           ;COULDN'T DO IT, SET ERROR FLAG
482 001744  000207      10$: RETURN
483
484      ;REAROM - READS A BYTE FROM E2PROM ADDRESS (R0)+ INTO R5. AUTOMATICLY ADJUSTS
485      ;PCRLB. UPDATES CKSUM IN R3
486      ; ENTRY - R0 ADDRESS IN ROM TO READ FROM
487      ; R3 PARTIAL CKSUM
488      ; PCRLB CORRECT VALUE FOR BYTE TO READ
489      ; EXIT R0 ADDRESS OF NEXT BYTE
490      ; R3 UPDATED CKSUM
491      ; R5 BYTE READ
492      ; PCRLB CORRECT VALUE FOR NEXT BYTE
493
494 001746  012005      REAROM: MOV   (R0)+,R5      ;GET A BYTE & UPDATE ADDR. BY 2
495 001750  060503      ADD   R5,R3      ;UPDATE CKSUM
496 001752  020027  166000      CMP   R0,#ENDE2R  ;SEE IF WE SHOULD SWITCH PAGES
497 001756  001005      BNE  10$      ;NO
498 001760  012700  165000      MOV   #E2PROM,R0 ;YES - GO TO START OF PAGE
499 001764  062737  000002  177522      ADD   #2,#PCR      ;ADVANCE A PAGE
500 001772  000207      10$: RETURN
501
502
503      ;ROMADR - CALCULATE PAGE OFFSET FROM END OF ROM GIVEN SIZE IN BYTES
504      ; ENTRY - R1 SIZE IN BYTES
505      ; EXIT - R0 INITIAL ADDRESS FOR FIRST BYTE IN ROM
506      ; R1 SIZE IN BYTES
507      ; PCRLB CORRECT VALUE FOR FIRST BYTE IN ROM
508
509 001774  010100      ROMADR: MOV   R1,R0      ;COPY BYTE COUNT
510 001776  010105      MOV   R1,R5      ;SECOND COPY
511 002000  072527  177770      ASH  #-8.,R5      ;DIVIDE BYTE COUNT BY 256. BYTE PAGES
512 002004  012704  000010      MOV   #7+1,R4      ;LAST PAGE IN 2 K PART + 1
513 002010  160504      SUB   R5,R4      ;STARTING PAGE NUMBER
514
515 002012  042700  177400      BIC  #177400,R0      ;LEAVE ONLY BITS 7:0
516 002016  006300      ASL  R0      ;DOUBLE VALUE
517 002020  001003      BNE  20$
518 002022  012700  165000      MOV   #E2PROM,R0
519 002024  000406      BR   30$      ;IF 0
520
521 002030  005400      20$: NEG   R0      ;MAKE STARTING ADDRESS BITS 8:0
522 002032  042700  177000      BIC  #177000,R0
523 002036  052700  165000      BIS  #E2PROM,R0      ;MAKE A E2PROM ADDRESS
524 002042  005304      DEC  R4      ;DECREMENT PAGE NUMBER BY 1
525
526 002044  006304      30$: ASL  R4      ;MAKE PAGE NUMBER CORRECT FOR PCR
527 002046  110437  177522      MOVB R4,#PCRLB      ;CORRECT PAGE IN PCRLB
528 002052  000207      RTS   PC      ;RETURN
529
530 002054  000000      WERR: 0      ;FLAG FOR BAD BYTE
531 002056  177777      OLDSIZ: -1      ;>0 - SIZE IN BYTES OF OLD LANGUAGE, 0 IF NO
532      ;LANGUAGE, -1 IF E2PROM MAY BE BAD/NONEXISTANT
533 002060  000000      UFDSIZ: 0      ;SIZE IN BYTES OF OLD UFD AREA

```

PROGRAM SUBROUTINES

```

534
535           .SBTTL  "FIELD SERVICE MODE" ERROR MESSAGES
536
537           .ENABL  LC
538 002062      105      105      120  FMSG1:  .ASCII  /EEPROM write error, PCR page /
      002065      122      117      115
      002070      040      167      162
      002073      151      164      145
      002076      040      145      162
      002101      162      157      162
      002104      054      040      120
      002107      103      122      040
      002112      160      141      147
      002115      145      040
539 002117      130      054      040  FMSG1A: .ASCII  /X, address /
      002122      141      144      144
      002125      162      145      163
      002130      163      040
540 002132
541 002140      015      012      104  FMSG1B: .BLKB   6           ;FOR ADDRESS
      002143      141      164      141      .ASCIZ  <CR><LF>/Data written /
      002146      040      167      162
      002151      151      164      164
      002154      145      156      040
      002157      000
542 002160
543 002163
544 002166      054      040      104  DUMMY1: .BLKB   3           ;3 UPPER BYTES NOT TO BE PRINTED
      002171      141      164      141  FMSG1C: .BLKB   3
      002174      040      162      145      .ASCIZ  /, Data read /
      002177      141      144      040
      002202      000
545 002203
546 002206
547 002211      056
548 002212      015      012      000  DUMMY2: .BLKB   3           ;3 UPPER BYTES NOT TO BE PRINTED
549 002215      114      141      156  FMSG1D: .BLKB   3
      002220      147      165      141      .ASCII  ./
      002223      147      145      040  CRLF:  .ASCIZ  <CR><LF>
      002226      101      162      145  FMSG2:  .ASCIZ  /Language Area not supported on this processor./<CR><LF>
      002231      141      040      156
      002234      157      164      040
      002237      163      165      160
      002242      160      157      162
      002245      164      145      144
      002250      040      157      156
      002253      040      164      150
      002256      151      163      040
      002261      160      162      157
      002264      143      145      163
      002267      163      157      162
      002272      056      015      012
      002275      000
550 002276      015      012      127  FMSG3:  .ASCIZ  <CR><LF>/WARNING: UFD area has been corrupted./<CR><LF>
      002301      101      122      116
      002304      111      116      107
      002307      072      040      125

```

'FIELD SERVICE MODE" ERROR MESSAGES

	002312	106	104	040	
	002315	141	162	145	
	002320	141	040	150	
	002323	141	163	040	
	002326	142	145	145	
	002331	156	040	143	
	002334	157	162	162	
	002337	165	160	164	
	002342	145	144	056	
	002345	015	012	000	
551	002350	103	150	145	FMSG4: .ASCIZ /Checksum error in EEPROM setup area./<CR><LF>
	002353	143	153	163	
	002356	165	155	040	
	002361	145	162	162	
	002364	157	162	040	
	002367	151	156	040	
	002372	105	105	120	
	002375	122	117	115	
	002400	040	163	145	
	002403	164	165	160	
	002406	040	141	162	
	002411	145	141	056	
	002414	015	012	000	
552	002417				BUFF: ;TEMPORARY SAVE AREA FOR OLD AREA
553	001000				.END START

Symbol table

BACKSP= 000010	DUMMY2 002203	FMSG1B 002132	MOVROM 001566	ROMADR 001774
BCSR = 177520	ENDE2R= 166000	FMSG1C 002163	NARGS = 000001	SPACE = 000040
BDR = 177524	ESC = 000033	FMSG1D 002206	NTRYE = 000027	START 001000
BIT6 = 000100	EXIT 001502	FMSG2 002215	OLDSIZ 002056	TAB = 000011
BIT7 = 000200	E2LLB = 165006	FMSG3 002276	PCR = 177522	UFDHDR= 000040
BUFF 002417	E2PAR = 165316	FMSG4 002350	PCRLB = 177522	UFDSIZ 002060
CR = 000015	E2PROM= 165000	LANG 001210	REAROM 001746	USETUP 001114
CRLF 002212	E2WRIT 001520	LF = 000012	RETRY = 000003	WERR 002054
DELAY = 025370	FMSG1 002062	LNGHDR= 000140	RMVTST= 173002	WRBYTE 001614
DUMMY1 002160	FMSG1A 002117	MAXERR= 000004		

. ABS. 002417 000 (RW,I,GBL,ABS,OVR)
 000000 001 (RW,I,LCL,REL,CON)

Errors detected: 0

*** Assembler statistics

Work file reads: 0
 Work file writes: 0
 Size of work file: 8503 Words (34 Pages)
 Size of core pool: 19402 Words (74 Pages)
 Operating system: RSX-11M/PLUS (Under VAX/VMS)

Elapsed time: 00:00:35.75
 OEEHAO.BIC,COEHAO/CR=COEHAO

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
BACKSP	= 000010	#5-239
BCSR	= 177520	#5-218 6-292 *6-293 *6-419
BDR	= 177524	#5-233
BIT6	= 000100	#5-237
BIT7	= 000200	#5-236 6-322 6-325 6-330 6-333 6-335
BUFF	002417	6-403 6-412 #6-552
CR	= 000015	#5-234 6-541 6-548 6-549 6-550 6-550 6-551
CRLF	002212	#6-548
DELAY	= 025370	#5-226 6-462
DUMMY1	002160	6-475 6-475 #6-542
DUMMY2	002203	6-479 6-479 #6-545
ENDE2R	= 166000	#5-224 6-340 6-430 6-496
ESC	= 000033	#5-241
EXIT	001502	6-315 6-327 6-336 6-350 6-360 6-394 6-405 6 410 #6 418
E2LLB	= 165006	6-427 #5-223 6-319 *6-335
E2PAR	= 165316	#5-222 6-328
E2PROM	= 165000	#5-221 5-222 5-223 5-224 6-301 6-310 6-312 6 432 6-498
E2WRIT	001520	6-518 6-523 6-414 #6-423
FMSG1	002062	6-473 6-473 #6-538
FMSG1A	002117	*6-470 #6-539
FMSG1B	002132	6-472 6-472 #6-540
FMSG1C	002163	6-476 6-476 #6-543
FMSG1D	002206	6-480 6-480 #6-546
FMSG2	002215	6-298 6-298 #6-549
FMSG3	002276	6-425 6-425 #6-550
FMSG4	002350	6-314 6-314 #6-551
LANG	001210	6-321 6-332 #6-340
LF	= 000012	#5-235 6-541 6-548 6-549 6-550 6-550 6-551
LNGHDR	= 000140	#5-227 6-359
MAXERR	= 000004	#5-231
MOVROM	001566	6-404 #6-447
NARGS	= 000001	#6-298 6-298 #6-314 6-314 #6-425 6-425 #6-472 6-472 6-472
		#6-473 6-473 #6-475 6-475 #6-476 6-476 #6-479 6-479
		6-479 #6-480 6-480
NTYPE	= 000027	#6-298 6-298 #6-314 6-314 #6-425 6-425 #6-472 6-472 #6-473
		6-473 #6-475 6-475 #6-475 6-475 #6-476 6-476 #6-479 6-479
		#6-480 6-480
OLDSIZ	002056	#6-531
PCR	= 177522	#5-219 *6-291 *6-420 *6-433 *6-499
PCRLB	= 177522	#5-220 *6-341 *6-390 6-467 *6-527
REAROM	001746	6-370 6-371 6-372 6-374 6-376 6-451 #6-494
RETRY	= 000003	#5-229 6 460
RMVTST	= 173002	#5-225
ROMADR	001774	6-368 6-411 6-448 #6-509
SPACE	= 000040	#5-240
START	001000	#6-291 6-553
TAB	= 000011	#5-238
UFDHDR	= 000040	#5-228 6-383
UFDSIZ	002060	*6-401 6-409 #6-533
USETUP	001114	6-313 #6-319

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
WERR	002054	#6-530
WRBYTE	001614	6-323 6-326 6-331 6-334 6-393 6-423 #6-457

MACRO CROSS REFERENCE

CREF V02

MACRO NAME	REFERENCES
.FRCTY	05-276 6-425
.ITOA	05-255 6-472 6-475 6-479
.TYPMS	05-244 6-298 6 314 6-473 6-476 6-480