KDJ11-B

EEPROM GER LANG LDR
COEEDA0

AH-FF23A-MC
1 OF 1 JUL 1985
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                                        .TITLE  COEEDA EEPROM GER LANG LDR


                                                                           .REM &

                                                    IDENTIFICATION
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                                        PRODUCT CODE:   AC-FF22A-MC

                                        PRODUCT NAME:   COEEDAO EEPROM GER LANG LDR

                                        PRODUCT DATE:   FEBRUARY, 1985

                                        MAINTAINER:     DIAGNOSTIC ENGINEERING









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TABLE OF CONTENTS

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 desctiption 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 seperate language. The UFD package will use the local language for the particular country and, in addition, will load diagnostic and error messages in the local 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 load the local language into the EEPROM. If it detects an error, the program will attempt to restore the "old" language, if any and will print a message informing the user of that fact.

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 HALT on Break the following registers should be set up:

```
17777572=0       to disable memmory management
17777520=1000    to clear diagnostic mode (bit 8), but still save
                 HALT on Break
17777746=400     to flush the cache
```

4. SPECIAL ENVIRONMENTS

The program is not APT compatible.

5. PROGRAM OPTIONS

None.

6. EXECUTION TIMES

The program runs in under 20 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 mmmmmm.
Data written qqq, data read rrr.
```

where n is the EEPROM page selected by the Page Control Register (PCR), mmmmmm is the physical address of the bad byte in question, qqq 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 qqq)

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 "OLD" BOOT ROM CODE, LANGUAGE AREA NOT SUPPORTED

The program checks to see if the ROM code version is 7.0 or later. Earlier versions do not support the language area in the EEPROM and would print garbage if one was loaded. The program prints the following message in that case:

```
Current Boot ROM version does not support language area.
```

In addition, the language bit in the setup area of the EEPROM is cleared, to prevent "garbage" from being printed.

7.4 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.

7.5 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 any error is detected, the program will attempt to restore the UFD and language areas to the state they were in when the program was started. If the restoration was successful, the following message is printed in the user's language:

Unable to load <language>

where <language> is the name of the language. If the restoration was not successful, or there was no local language, the following message is printed.

Unable to load <language> - reverting to U.S. English

where <language> is as above. The program then clears the bit in the EEPROM setup area selecting a local language which means that the ROM English will be used from now on.

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

The program consists of a body of code which loads the language into the local language area of the EEPROM. The routine that performs the write first checks the current value of the byte to be written and if it is the same, no write is performed. This is done to extend the life of the EEPROM. The write routine also checks the value in the EEPROM after the write to insure it was written correctly. After a succesful run, no message appears, after 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 one of the messages in 7.5 appear. In both cases, the XXDP prompt appears.

```
                              .SBTTL  PROGRAM CONSTANTS
000000                        .ENABL  ABS
                              .NLIST  MD,CND
                              .LIST   ME

          177520              BCSR    =       177520
          177522              PCR     =       177522
          177522              PCRLB   =       177522
          165000              E2PROM  =       165000
          165316              E2PAR   =       E2PROM+316      ;E2PROM PARITY BYTE
          165006              E2LLB   =       E2PROM+6        ;LOCAL LANGUAGE BIT IN E2PROM
          166000              ENDE2R  =       E2PROM+1000     ;LAST ADDRESS OF E2PROM+2
          173002              RMVTST  =       173002          ;WORD TO TEST ROM VERSION NUMBER
          025370              DELAY   =       11000.
          000140              LNGHDR  =       140             ;I.D. OF A LANGUAGE AREA
          000040              UFDHDR  =       040             ;I.D. OF A UFD BLOCK
          000002              RETRY   =       2               ;NUMBER OF ATTEMPTS TO WRITE A
                                                              ;BYTE IN E2PROM BEFORE GIVING UP
          000004              MAXERR  =       4               ;NO. OF ERRORS ALLOWED IN LOCAL
                                                              ;LANGUAGE TEXT BEFORE QUITTING
          177524              BDR     =       177524
          000015              CR      =       15
          000012              LF      =       12
          000200              BIT7    =       200
          000100              BIT6    =       100
          000011              tab     =       11
          000010              backsp  =       10
          000040              space   =       40
          000033              esc     =       33

          001764              ROMSZ   =       FLEND-TEXT      ;SIZE IN BYTES OF TEXT TO BE
                                                              ;LOADED INTO EEPROM



```

```
                                      .SBTTL  CHECK FOR CERTAIN EXCEPTIONS FIRST

        001000                .=1000

001000  005037  177522        START:  CLR     @#PCR                   ;SELECT PAGE 0 OF EEPROM
001004  013746  177520                MOV     @#BCSR,-(SP)            ;SAVE OLD BCSR VALUE
001010  112737  000067  177520        MOVB    #67,@#BCSR              ;WRITE ENABLE THE E2PROM & ENABLE ROM

001016  000007                        MFPT                            ;GET PROCESSOR TYPE
001020  020027  000005                CMP     R0,#5                   ;CHECK TO SEE IF ORION
001024  001404                        BEQ     1$                      ;YES - CONTINUE
001026                                .TYPMSG #FMSG2                  ;FIELD-SERVICE MESSAGE
        000001                        .NARG   NARGS
        000027                        .NTYPE  NTYPE,#FMSG2
001026  012700  002563                  MOV   #FMSG2,R0
001032  104003                          EMT   3
001034  000443                        BR      99$

001036  012700  165000        1$:     MOV     #E2PROM,R0              ;STARTING ADDRESS TO CHECKSUM
001042  005001                        CLR     R1                      ;INITIALIZE CHECKSUM
001044  012703  000151                MOV     #105.,R3                ;NO. OF BYTES TO CKSUM
001050  012005                201$:   MOV     (R0)+,R5                ;GET A BYTE
001052  042705  177400                BIC     #177400,R5              ;NO BUS NOISE, THANK YOU.
001056  060501                        ADD     R5,R1                   ;ACCUMULATE CHECKSUM
001060  077305                        SOB     R3,201$                 ;CONTINUE TILL DONE
001062  105701                        TSTB    R1                      ;IS CKSUM 0?
001064  001007                        BNE     202$                    ;NO, ERROR
001066  105737  165022                TSTB    @#E2PROM+22             ;BYTE TO TEST FOR VALID ROM, SHOULD BE 0
001072  001004                        BNE     202$                    ;NO, ERROR
001074  123727  165314  000252        CMPB    @#E2PROM+314,#252               ;BYTE TO TEST FOR VALID ROM
001102  001404                        BEQ     300$                    ;GO TO NEXT CHECK IF OK
001104                        202$:   .TYPMSG #FMSG4                  ;FIELD SERVICE MESSAGE
        000001                        .NARG   NARGS
        000027                        .NTYPE  NTYPE,#FMSG4
001104  012700  002737                  MOV   #FMSG4,R0
001110  104003                          EMT   3
001112  000414                        BR      99$                     ;QUIT
001114  005067  001304        300$:   CLR     OLDSIZ                  ;SET FLAG THAT ROM EXISTS, CURRENTLY NO LANGUAGE
001120  012737  000016  177522        MOV     #7*2,@#PCR              ;SEL. LAST PAGE OF 2K E2PROM, PG0 OF ROM
001126  023727  173002                CMP     @#RMVTST,(PC)+          ;SEE IF ROM VER. 7 OR LATER (CAN SUPPORT LANGUAGE AREA)
001132  000250                        CLN
001134  001405                        BEQ     2$                      ;YES - CONTINUE
001136                                .TYPMSG #FMSG3
        000001                        .NARG   NARGS
        000027                        .NTYPE  NTYPE,#FMSG3
001136  012700  002644                  MOV   #FMSG3,R0
001142  104003                          EMT   3
001144  000167  000636        99$:    JMP     QUIT1


                                      .SBTTL  SAVE OLD LANGUAGE/UFD AREA IN CASE IT MUST BE RESTORED

001150  012700  165776        2$:     MOV     #ENDE2R-2,R0            ;LAST ADDRESS (CKSUM) OF E2PROM
001154  012701  000005                MOV     #5,R1                   ;NO. OF BYTES IN HEADER TO CHECKSUM
001160  010005                        MOV     R0,R5                   ;SAVE ADDRESS
001162  005003                        CLR     R3                      ;
001164  111004                4$:     MOVB    (R0),R4                 ;GET A BYTE
001166  060403                        ADD     R4,R3                   ;ACCUMULATE CHECKSUM
```

SAVE OLD LANGUAGE/UFD AREA IN CASE IT MUST BE RESTORED

```
001170  005740                          TST     -(R0)           ;CORRECT ADDRESS
001172  077104                          SOB     R1,4$           ;LOOP FOR 5 BYTES
001174  105703                          TSTB    R3              ;IF NOT ZERO, NO LANGUAGE LOADED
001176  001131                          BNE     WRLANG          ;NON-EXISTANT OR CORRUPTED LANGUAGE - SKIP

001200  014504                          MOV     -(R5),R4        ;HIGH BYTE OF BYTE COUNT
001202  014546                          MOV     -(R5),-(SP)     ;LOW BYTE OF BYTE COUNT
001204  110466  000001                  MOVB    R4,1(SP)        ;SET UPPER BYTES OF SIZE
001210  042704  177437                  BIC     #177437,R4      ;EXTRACT ID CODE
001214  012601                          MOV     (SP)+,R1        ;GET SIZE BACK
001216  042701  160000                  BIC     #160000,R1      ;R1 NOW CONTAINS SIZE OF BLOCK IN BYTES
001222  062701  000005                  ADD     #5,R1           ;ADD BYTE COUNT FOR HEADER BLOCK
001226  120427  000040                  CMPB    R4,#UFDHDR      ;SEE IF IT IS A UFD BLOCK
001232  001013                          BNE     LANG            ;NO, CHECK FOR A LANGUAGE
001234  010104                          MOV     R1,R4           ;SAVE SIZE
001236  012702  005121                  MOV     #BUFF,R2        ;ADDRESS OF SAVE BUFFER
001242  004767  000666                  CALL    MOVROM          ;MOVE UFD AREA TO MEMORY
001246  001105                          BNE     WRLANG          ;BAD CKSUM, QUIT
                                                                ;NOTE - R3 CONTAINS CHECKSUM OF BLOCK AND HEADER
                                                                ;HOWEVER THE CHECKSUM OF HEADER IS ALREADY KNOWN
                                                                ;TO BE 0 SO R3 IS A VALID CHECK OF UFD BLOCK
001250  010167  001150                  MOV     R1,OLDSIZ       ;SAVE TOTAL SIZE
001254  010167  001146                  MOV     R1,UFDSIZ       ;SAVE SIZE OF UFD AREA
001260  000500                          BR      WRLANG

001262  120427  000140          LANG:   CMPB    R4,#LNGHDR      ;IS THIS A LANGUAGE HEADER?
001266  001075                          BNE     WRLANG          ;NO - QUIT
001270  010167  001130                  MOV     R1,OLDSIZ       ;SAVE SIZE FOR NOW
001274  062701  000005                  ADD     #5,R1           ;ADD SIZE OF (POSSIBLE) UFD HEADER
001300  004767  001036                  CALL    ROMADR          ;SET UP PCR AND R0
001304  005003                          CLR     R3              ;INITIALIZE CKSUM
001306  004767  001002                  CALL    REAROM          ;GET A BYTE
001312  004767  000776                  CALL    REAROM          ;GET A BYTE
001316  004767  000772                  CALL    REAROM          ;GET A BYTE
001322  010546                          MOV     R5,-(SP)        ;SAVE LOW BYTE OF SIZE FOR LATER
001324  004767  000764                  CALL    REAROM          ;GET A BYTE
001330  110566  000001                  MOVB    R5,1(SP)        ;SAVE HIGH BYTE OF SIZE AND ID
001334  004767  000754                  CALL    REAROM          ;GET A BYTE
001340  116600  000001                  MOVB    1(SP),R0        ;GET I.D.
001344  012601                          MOV     (SP)+,R1        ;GET SIZE
001346  105703                          TSTB    R3              ;SEE IF VALID CKSUM
001350  001025                          BNE     1$              ;NO - WE HAVE LANGUAGE ONLY.

001352  042700  177437                  BIC     #177437,R0      ;GET ID ONLY
001356  120027  000040                  CMPB    R0,#UFDHDR      ;IS THIS A UFD BLOCK?
001362  001020                          BNE     1$              ;NO, IGNORE IT.

                                ;WE HAVE BOTH A LANGUAGE AREA AND A UFD BLOCK.  SAVE THE UFD BLOCK.

001364  042701  160000                  BIC     #160000,R1      ;GET RID OF ID
001370  062701  000005                  ADD     #5,R1           ;SIZE OF HEADER
001374  010104                          MOV     R1,R4           ;BYTE COUNT TO MOVE
001376  010167  001024                  MOV     R1,UFDSIZ       ;SAVE UFD SIZE
001402  066701  001016                  ADD     OLDSIZ,R1       ;ADD SIZE OF LANGUAGE AREA
001406  012702  005121                  MOV     #BUFF,R2        ;MEMORY ADDRESS TO SAVE TO
001412  004767  000516                  CALL    MOVROM          ;SAVE UFD AREA
001416  001404                          BEQ     2$              ;YES, IT IS VALID, CONTINUE
```

```
001420  005067  001002                            CLR     UFDSIZ            ;NO UFD AREA
001424  012702  005121                  1$:       MOV     #BUFF,R2          ;RESET R2
001430  016701  000770                  2$:       MOV     OLDSIZ,R1         ;SIZE OF LANGUAGE AREA
001434  010104                                    MOV     R1,R4             ;BYTES TO MOVE
001436  066767  000764  000760                    ADD     UFDSIZ,OLDSIZ     ;OLDSIZ IS THE TOTAL SIZE
001444  004767  000464                            CALL    MOVROM            ;SAVE LANGUAGE AREA
001450  001404                                    BEQ     WRLANG            ;LANGUAGE IS GOOD
001452  005067  000746                            CLR     OLDSIZ            ;NO LANGUAGE
001456  005067  000744                            CLR     UFDSIZ            ;NO UFD AREA

                                        ;GENERATE CHECKSUM FOR FOREIGN LANGUAGE TEST FILE & WRITE TO THE MEMORY IMAGE

001462  012700  003135                  WRLANG:   MOV     #TEXT,R0          ;ADDRESS OF BEGINNING OF TEXT
001466  005001                                    CLR     R1                ;INIT CHECKSUM
001470  112002                          25$:      MOVB    (R0)+,R2          ;READ A BYTE
001472  160201                                    SUB     R2,R1             ;ACCUMULATE CHECKSUM
001474  020027  005113                            CMP     R0,#CKSUM         ;FINISHED ALL TEXT ?
001500  001373                                    BNE     25$               ;NO-CONTINUE
001502  110110                                    MOVB    R1,(R0)           ;WRITE THE CHECKSUM

                                                  .SBTTL  LOAD LOCAL LANGUAGE INTO E2PROM

                                        ;WRITE UFD & LOCAL LANGUAGE BLOCKS

001504  016701  000716                            MOV     UFDSIZ,R1         ;GET THE LENGTH OF THE UFD
001510  062701  001764                            ADD     #ROMSZ,R1         ;... & THE TEXT AREA
001514  004767  000622                            JSR     PC,ROMADR         ;COMPUTE E2PROM PAGE AND ADDR
001520  016701  000702                            MOV     UFDSIZ,R1         ;SIZE OF UFD AREA TO SAVE
001524  001406                                    BEQ     40$               ;NO UFD AREA - SKIP
001526  012702  005121                            MOV     #BUFF,R2          ;ADDRESS OF BEGINNING OF UFD AREA
001532  112205                          35$:      MOVB    (R2)+,R5          ;GET SOME DATA
001534  004767  000126                            CALL    E2WRIT            ;GO WRITE IT
001540  077104                                    SOB     R1,35$            ;FINISHED UFD?
                                                                            ;YES-DO LANGUAGE
001542  012702  003135                  40$:      MOV     #TEXT,R2          ;ADDRESS OF EEPROM LANGUAGE TEXT
001546  012701  001764                            MOV     #ROMSZ,R1         ;BYTES TO MOVE
001552  112205                          50$:      MOVB    (R2)+,R5          ;GET SOME DATA
001554  004767  000106                            CALL    E2WRIT            ;WRITE A BYTE
001560  077104                                    SOB     R1,50$            ;ARE WE DONE?
                                                                            ;YES - EXIT
001562  112705  000200                            MOVB    #BIT7,R5          ;TURN ON LOCAL LANGUAGE BIT IN
                                                                            ;SETUP AREA, THEN EXIT

001566  105037  177522                  EXIT:     CLRB    @#PCRLB           ;SELECT PAGE 0
001572  012700  165006                            MOV     #E2LLB,R0         ;E2PROM WORD CONTAINING LOCAL LANG. BIT
001576  111001                                    MOVB    (R0),R1
001600  142701  177577                            BICB    #↑CBIT7,R1        ;GET CURRENT LOCAL LANGUAGE BIT
001604  120501                                    CMPB    R5,R1             ;SEE IF BIT ALREADY CORRECT
001606  001415                                    BEQ     EXIT1             ;YES, JUST RETURN
001610  112701  000200                            MOVB    #BIT7,R1          ;LOCAL LANGUAGE BIT
001614  111005                                    MOVB    (R0),R5           ;GET OLD WORD AGAIN
001616  074105                                    XOR     R1,R5             ;FLIP THE BIT
001620  004767  000336                            CALL    WRBYTE            ;CHANGE LOCAL LANGUAGE BIT IN E2PROM
001624  001006                                    BNE     EXIT1             ;WOULD NOT WRITE, JUST GIVE UP
001626  012700  165316                            MOV     #E2PAR,R0         ;ADDRESS OF CKSUM BYTE
001632  111005                                    MOVB    (R0),R5           ;GET OLD CKSUM BYTE
001634  074105                                    XOR     R1,R5             ;CORRECT THE CKSUM
```

LOAD LOCAL LANGUAGE INTO E2PROM

```
   469 001636   004767  000320                      CALL    WRBYTE            ;UPDATE E2ROM
   470
   471 001642                             EXIT1:    .FRCTYP #CRLF             ;COMPLETE LINE
                000001                              .NARG   NARGS
                000027                              .NTYPE  NTYPE,#CRLF
       001642   012700  002560                        MOV   #CRLF,R0
       001646   104044                                EMT   44
   472 001650   142716  000060                      BICB    #60,(SP)          ;BE SURE ROM IS DISABLED
   473 001654   012637  177520                      MOV     (SP)+,@#BCSR      ;RESTORE BCSR
   474 001660   005037  177522                      CLR     @#PCR             ;
   475 001664   000207                              RTS     PC
   476
   477 001666   004767  000270            E2WRIT:   CALL    WRBYTE            ;WRITE THE BYTE TO E2PROM
   478 001672   001431                              BEQ     3$                ;OK THIS TIME
   479 001674   005267  000522                      INC     WERR              ;FLAG BAD BYTE
   480
   481 001700   026727  000516  000004              CMP     WERR,#MAXERR      ;CHECK TO SEE IF PAST THE MAXIMUM ERROR
   482 001706   003036                              BGT     QUIT              ;LIMIT OF BAD BYTES ALLOWED
   483
   484 001710   020227  003232                      CMP     R2,#M001          ;CHECK TO SEE IF ERROR IS IN MESSAGE
   485 001714   101433                              BLOS    QUIT              ;BYTE COUNT (MUST BE CORRECT)
   486
   487 001716   020227  005112                      CMP     R2,#MEND1         ;CHECK TO BE SURE DICTIONARY AND UFD
   488 001722   101030                              BHI     QUIT              ;BLOCKS ARE NOT CORRUPTED
   489
   490 001724   132705  000140                      BITB    #140,R5           ;CHECK TO SEE IF IT SHOULD BE A CONTROL
   491 001730   001425                              BEQ     QUIT              ;CODE (POSSIBLY DICTIONARY ENTRY)
   492
   493 001732   132710  000140                      BITB    #140,(R0)         ;IF CONTROL CODE (DICTIONARY REFERENCE
   494 001736   001422                              BEQ     QUIT              ;PERHAPS) CALL IT QUITS
   495
   496 001740   111004                              MOVB    (R0),R4           ;WE WILL LIVE WITH THIS ERROR, CORRECT
   497 001742   116703  003145                      MOVB    CKSUM,R3          ;THE CHECKSUM TO ACCOUNT FOR NEW VALUE
   498 001746   060503                              ADD     R5,R3             ;CANCEL OUT WHAT WAS SUPPOSED TO BE
   499 001750   160403                              SUB     R4,R3             ;CORRECT FOR ERRONEOUS VALUE
   500 001752   110367  003135                      MOVB    R3,CKSUM          ;PUT BACK CORRECTED VALUE
   501
   502 001756   062700  000002            3$:       ADD     #2,R0             ;INCREMENT LOCATION
   503 001762   020027  166000                      CMP     R0,#ENDE2R        ;FINISHED THIS PAGE ?
   504 001766   001005                              BNE     10$               ;NO-RETURN
   505 001770   012700  165000                      MOV     #E2PROM,R0        ;YES-RESET ADDRESS
   506 001774   062737  000002  177522              ADD     #2,@#PCR          ;INCREMENT PCR TO NEXT PAGE
   507 002002   000207                    10$:      RETURN
   508
   509 002004   005726                    QUIT:     TST     (SP)+             ;CORRECT STACK
   510 002006   032737  000100  000052    QUIT1:    BIT     #BIT6,@#52        ;SEE IF UFD QUIET
   511 002014   001403                              BEQ     5$                ;NO
   512 002016                                       .FRCTYP #MSG000           ;MESSAGE FOR USER IN HIS OWN LANGUAGE
                000001                              .NARG   NARGS
                000027                              .NTYPE  NTYPE,#MSG000
       002016   012700  003006                        MOV   #MSG000,R0
       002022   104044                                EMT   44
   513 002024   016701  000374            5$:       MOV     OLDSIZ,R1
   514 002030   100704                              BMI     EXIT1             ;ERROR WAS NOT ORION OR CKSUM ERROR, DO NOT
   515                                                                        ;TRY TO CLEAR LANGUAGE BIT
   516 002032   001427                              BEQ     40$               ;IF NO OLD LANGUAGE TO RESTORE
   517 002034   004767  000302                      JSR     PC,ROMADR         ;COMPUTE STARTING ADDRESS OF OLD LANG IN E2PROM
```

```
002040  012702  005121                   MOV     #BUFF,R2          ;STARTING ADDRESS OF OLD LANGUAGE TEXT
002044  112205                   10$:    MOVB    (R2)+,R5          ;GET A BYTE
002046  004767  000110                   CALL    WRBYTE            ;WRITE IT OUT
002052  001017                           BNE     40$               ;IF ERROR, GIVE UP
002054  062700  000002                   ADD     #2,R0             ;INCREMENT LOCATION
002060  020027  166000                   CMP     R0,#ENDE2R        ;FINISHED THIS PAGE ?
002064  001005                           BNE     20$               ;NO-CONTINUE
002066  012700  165000                   MOV     #E2PROM,R0        ;YES-RESET ADDRESS
002072  062737  000002  177522           ADD     #2,@#PCR          ;INCREMENT PCR TO NEXT PAGE
002100  077117                   20$:    SOB     R1,10$            ;LOOP UNTIL DONE
002102  026767  000320  000314           CMP     UFDSIZ,OLDSIZ     ;IF THE SAME THEN NO LANGUAGE
002110  001254                           BNE     EXIT1             ;IF LANGUAGE, LEAVE E2PROM LANG. BIT AS IT WAS
002112  005005                   40$:    CLR     R5                ;TURN OFF LOCAL LANGUAGE BIT IN E2PROM
002114  036737  175760  000052           BIT     BIT6,@#52         ;SEE IF UFD QUIET
002122  001621                           BEQ     EXIT              ;NO
002124                                   .FRCTYP #MSG001
        000001                           .NARG   NARGS
        000027                           .NTYPE  NTYPE,#MSG001
002124  012700  003070                     MOV   #MSG001,R0
002130  104044                             EMT   44
002132  000615                           BR      EXIT              ;AND CALL IT A DAY


                                         .SBTTL  PROGRAM SUBROUTINES

                                 ;MOVROM - MOVE BYTES FROM EEPROM TO MEMORY
                                 ;ENTRY-  R1 = STARTING ADDRESS IN EEPROM (# OF BYTES FROM END)
                                 ;        R2 = ADDRESS OF MEMORY BUFFER
                                 ;        R4 = # OF BYTES TO MOVE
                                 ;EXIT    R1 - UNCHANGED
                                 ;        R2 - UPDATED MEMORY ADDRESS
                                 ;        R3 = (BYTE) 0 IF VALID CKSUM
                                 ;        "Z" FLAG SET IF CKSUM VALID

002134  010403                   MOVROM: MOV     R4,R3             ;SAVE R4
002136  004767  000200                   CALL    ROMADR            ;LOAD PCR AND R0 WITH LANGUAGE START AREA
002142  010304                           MOV     R3,R4             ;RESTORE BYTE COUNT
002144  005003                           CLR     R3                ;INIT CHECKSUM
002146  004767  000142           5$:     CALL    REAROM            ;GET A BYTE
002152  110522                           MOVB    R5,(R2)+          ;SAVE IT
002154  077404                           SOB     R4,5$             ;LOOP TILL DONE
002156  105703                           TSTB    R3                ;IS CHECKSUM GOOD?
002160  000207                           RETURN

002162  120510                   WRBYTE: CMPB    R5,(R0)           ;IS THE NEW DATA DIFFERENT ?
002164  001452                           BEQ     10$               ;NO-DO NOT WRITE OVER

002166  012703  000002                   MOV     #RETRY,R3
002172  010510                   1$:     MOV     R5,(R0)           ;WRITE A LOCATION
002174  012704  025370                   MOV     #DELAY,R4         ;11 MS WAIT
002200  077401                           SOB     R4,.              ;WASTE TIME
002202  120510                           CMPB    R5,(R0)           ;SEE IF IT TOOK
002204  001442                           BEQ     10$               ;YES, ALL OKAY
002206  077307                           SOB     R3,1$             ;IF AT FIRST YOU DON'T SUCCEED...
002210  113704  177522                   MOVB    @#PCRLB,R4        ;PCR PAGE OF BAD BYTE
002214  106204                           ASRB    R4                ;CONVERT TO PAGE #
002216  062704  000060                   ADD     #'0,R4            ;CONVERT TO OCTAL
002222  110467  000237                   MOVB    R4,FMSG1A         ;STORE IT FOR PRINTING
```

```
 571 002226  010046                                  MOV     R0,-(SP)        ;SAVE ROM ADDRESS
 572 002230                                          .ITOA   ,#FMSG1B        ;CONVERT ROM ADDRESS TO OCTAL
             000002                                  .NARG   NARGS
             000027                                    .NTYPE        NTYPE,#FMSG1B
     002230  012701  002500                             MOV  #FMSG1B,R1
     002234  104030                                     EMT  30
 573 002236                                          .TYPMSG #FMSG1          ;PRINT OUT FIRST PART OF MESSAGE
             000001                                  .NARG   NARGS
             000027                                  .NTYPE  NTYPE,#FMSG1
     002236  012700  002430                            MOV   #FMSG1,R0
     002242  104003                                    EMT   3
 574 002244  042705  177400                          BIC     #177400,R5      ;MAKE SURE R5 IS POSITIVE AND A BYTE
 575 002250                                          .ITOA   R5,#DUMMY1      ;CONVERT TO OCTAL
             000002                                  .NARG   NARGS
             000005                                   .NTYPE         NTYPE,R5
     002250  010500                                     MOV  R5,R0
             000027                                    .NTYPE        NTYPE,#DUMMY1
     002252  012701  002526                             MOV  #DUMMY1,R1
     002256  104030                                     EMT  30
 576 002260                                          .TYPMSG #FMSG1C         ;PRINT OUT LAST 3 DIGITS OF NUMBER & MESSAGE
             000001                                  .NARG   NARGS
             000027                                  .NTYPE  NTYPE,#FMSG1C
     002260  012700  002531                            MOV   #FMSG1C,R0
     002264  104003                                    EMT   3
 577 002266  013600                                  MOV     @(SP)+,R0       ;GET BYTE AT ROM ADDRESS
 578 002270  042700  177400                          BIC     #177400,R0      ;GET RID OF BUS NOISE
 579 002274                                          .ITOA   ,#DUMMY2        ;CONVERT TO OCTAL
             000002                                  .NARG   NARGS
             000027                                    .NTYPE        NTYPE,#DUMMY2
     002274  012701  002551                             MOV  #DUMMY2,R1
     002300  104030                                     EMT  30
 580 002302                                          .TYPMSG #FMSG1D         ;PRINT LOWER 3 BYTES & REST OF MESSAGE
             000001                                  .NARG   NARGS
             000027                                  .NTYPE  NTYPE,#FMSG1D
     002302  012700  002554                            MOV   #FMSG1D,R0
     002306  104003                                    EMT   3
 581 002310  000244                                  CLZ                     ;COULDN'T DO IT, SET ERROR FLAG
 582 002312  000207                          10$:    RETURN
 583
 584                                         ;REAROM - READS A BYTE FROM E2PROM ADDRESS (R0)+ INTO R5. AUTOMATICLY ADJUSTS
 585                                         ;PCRLB.  UPDATES CKSUM IN R3
 586                                         ;       ENTRY - R0      ADDRESS IN ROM TO READ FROM
 587                                         ;               R3      PARTIAL CKSUM
 588                                         ;               PCRLB   CORRECT VALUE FOR BYTE TO READ
 589                                         ;       EXIT    R0      ADDRESS OF NEXT BYTE
 590                                         ;               R3      UPDATED CKSUM
 591                                         ;               R5      BYTE READ
 592                                         ;               PCRLB   CORRECT VALUE FOR NEXT BYTE
 593
 594 002314  012005                          REAROM: MOV     (R0)+,R5        ;GET A BYTE & UPDATE ADDR. BY 2
 595 002316  060503                                  ADD     R5,R3           ;UPDATE CKSUM
 596 002320  020027  166000                          CMP     R0,#ENDE2R      ;SEE IF WE SHOULD SWITCH PAGES
 597 002324  001005                                  BNE     10$             ;NO
 598 002326  012700  165000                          MOV     #E2PROM,R0      ;YES - GO TO START OF PAGE
 599 002332  062737  000002  177522                  ADD     #2,@#PCR                ;ADVANCE A PAGE
 600 002340  000207                          10$:    RETURN
 601
```

```

                                     ;ROMADR - CALCULATE PAGE OFFSET FROM END OF ROM GIVEN SIZE IN BYTES
                                     ;          ENTRY - R1      SIZE IN BYTES
                                     ;          EXIT -  R0      INITIAL ADDRESS FOR FIRST BYTE IN ROM
                                     ;                  R1      SIZE IN BYTES
                                     ;                  PCRLB   CORRECT VALUE FOR FIRST BYTE IN ROM

002342  010100                       ROMADR: MOV    R1,R0           ;COPY BYTE COUNT
002344  010105                               MOV    R1,R5           ;SECOND COPY
002346  072527  177770                       ASH    #-8.,R5         ;DIVIDE BYTE COUNT BY 256. BYTE PAGES
002352  012704  000010                       MOV    #7+1,R4         ;LAST PAGE IN 2 K PART + 1
002356  160504                               SUB    R5,R4           ;STARTING PAGE NUMBER

002360  042700  177400                       BIC    #177400,R0      ;LEAVE ONLY BITS 7:0
002364  006300                               ASL    R0              ;DOUBLE VALUE
002366  001003                               BNE    20$
002370  012700  165000                       MOV    #E2PROM,r0      ;
002374  000406                               BR     30$             ;IF 0

002376  005400                       20$:    NEG    R0              ;MAKE STARTING ADDRESS BITS 8:0
002400  042700  177000                       BIC    #177000,R0      ;
002404  052700  165000                       BIS    #E2PROM,R0      ;MAKE A E2PROM ADDRESS
002410  005304                               DEC    R4              ;DECREMENT PAGE NUMBER BY 1

002412  006304                       30$:    ASL    R4              ;MAKE PAGE NUMBER CORRECT FOR PCR
002414  110437  177522                       MOVB   R4,@#PCRLB      ;CORRECT PAGE IN PCRLB
002420  000207                               RTS    PC              ;RETURN

002422  000000                       WERR:   0                      ;FLAG FOR BAD BYTE
002424  177777                       OLDSIZ: -1                     ;>0 - SIZE IN BYTES OF OLD LANGUAGE, 0 IF NO
                                                                    ;LANGUAGE, -1 IF E2PROM MAY BE BAD/NONEXISTANT
002426  000000                       UFDSIZ: 0                      ;SIZE IN BYTES OF OLD UFD AREA

                                     .SBTTL  "FIELD SERVICE MODE" ERROR MESSAGES

                                     .ENABL LC
002430     105     105     120       FMSG1:  .ASCII  /EEPROM write error, PCR page /
002433     122     117     115
002436     040     167     162
002441     151     164     145
002444     040     145     162
002447     162     157     162
002452     054     040     120
002455     103     122     040
002460     160     141     147
002463     145     040
002465     130     054     040       FMSG1A: .ASCII  /X, address /
002470     141     144     144
002473     162     145     163
002476     163     040
002500                               FMSG1B: .BLKB   6              ;FOR ADDRESS
002506     015     012     104               .ASCIZ  <CR><LF>/Data written /
002511     141     164     141
002514     040     167     162
002517     151     164     164
002522     145     156     040
002525     000
```

```
002526                           DUMMY1: .BLKB   3               ;3 UPPER BYTES NOT TO BE PRINTED
002531                           FMSG1C: .BLKB   3
002534   054     040     104             .ASCIZ  /, Data read /
002537   141     164     141
002542   040     162     145
002545   141     144     040
002550   000
002551                           DUMMY2: .BLKB   3               ;3 UPPER BYTES NOT TO BE PRINTED
002554                           FMSG1D: .BLKB   3
002557   056                             .ASCII  /./
002560   015     012     000     CRLF:   .ASCIZ  <CR><LF>
002563   114     141     156     FMSG2:  .ASCIZ  /Language Area not supported on this processor./<CR><LF>
002566   147     165     141
002571   147     145     040
002574   101     162     145
002577   141     040     156
002602   157     164     040
002605   163     165     160
002610   160     157     162
002613   164     145     144
002616   040     157     156
002621   040     164     150
002624   151     163     040
002627   160     162     157
002632   143     145     163
002635   163     157     162
002640   056     015     012
002643   000
002644   103     165     162     FMSG3:  .ASCIZ  /Current boot ROM version does not support language area./<CR><LF>
002647   162     145     156
002652   164     040     142
002655   157     157     164
002660   040     122     117
002663   115     040     166
002666   145     162     163
002671   151     157     156
002674   040     144     157
002677   145     163     040
002702   156     157     164
002705   040     163     165
002710   160     160     157
002713   162     164     040
002716   154     141     156
002721   147     165     141
002724   147     145     040
002727   141     162     145
002732   141     056     015
002735   012     000
002737   103     150     145     FMSG4:  .ASCIZ  /Checksum error in EEPROM setup area./<CR><LF>
002742   143     153     163
002745   165     155     040
002750   145     162     162
002753   157     162     040
002756   151     156     040
002761   105     105     120
002764   122     117     115
002767   040     163     145
```

```
        002772       164       165       160
        002775       040       141       162
        003000       145       141       056
        003003       015       012       000
    652                                         .SBTTL  TRANSLATED LOADER ERROR MESSAGES
    653 003006       015       104       145    MSG000: .ASCIZ  <CR>!Deutsche Meldungen koennen nicht geladen werden.!
        003011       165       164       163
        003014       143       150       145
        003017       040       115       145
        003022       154       144       165
        003025       156       147       145
        003030       156       040       153
        003033       157       145       156
        003036       156       145       156
        003041       040       156       151
        003044       143       150       164
        003047       040       147       145
        003052       154       141       144
        003055       145       156       040
        003060       167       145       162
        003063       144       145       156
        003066       056       000
    654 003070       040       055       040    MSG001: .ASCIZ  ! - Zurueck zu englischen Meldungen.!<CR>
        003073       132       165       162
        003076       165       145       143
        003101       153       040       172
        003104       165       040       145
        003107       156       147       154
        003112       151       163       143
        003115       150       145       156
        003120       040       115       145
        003123       154       144       165
        003126       156       147       145
        003131       156       056       015
        003134       000
    655                                         .SBTTL  START OF AREA TO BE LOADED INTO E2PROM
    656
    657                                         .SBTTL  Deutsch LANGUAGE TEXT
    658
    659 003135       075                        TEXT:   .BYTE   M001-TEXT
    660 003136       010                                .BYTE   M002-M001
    661 003137       002                                .BYTE   M003-M002
    662 003140       006                                .BYTE   M004-M003
    663 003141       010                                .BYTE   M005-M004
    664 003142       007                                .BYTE   M006-M005
    665 003143       002                                .BYTE   M007-M006
    666 003144       002                                .BYTE   M010-M007
    667 003145       002                                .BYTE   M011-M010
    668 003146       000                                .BYTE   M012-M011
    669 003147       000                                .BYTE   M013-M012
    670 003150       000                                .BYTE   M014-M013
    671 003151       000                                .BYTE   M015-M014
    672 003152       000                                .BYTE   M016-M015
    673 003153       000                                .BYTE   M017-M016
    674 003154       000                                .BYTE   M020-M017
    675 003155       050                                .BYTE   M021-M020
    676 003156       030                                .BYTE   M022-M021
    677 003157      020                                      .BYTE   M023-M022
    678 003160      121                                      .BYTE   M024-M023
    679 003161      021                                      .BYTE   M025-M024
    680 003162      001                                      .BYTE   M026-M025
    681 003163      046                                      .BYTE   M027-M026
    682 003164      007                                      .BYTE   M030-M027
    683 003165      011                                      .BYTE   M031-M030
    684 003166      013                                      .BYTE   M032-M031
    685 003167      002                                      .BYTE   M033-M032
    686 003170      063                                      .BYTE   M034-M033
    687 003171      000                                      .BYTE   M035-M034
    688 003172      001                                      .BYTE   M036-M035
    689 003173      000                                      .BYTE   M037-M036
    690 003174      002                                      .BYTE   M040-M037
    691 003175      033                                      .BYTE   M041-M040
    692 003176      000                                      .BYTE   M042-M041
    693 003177      014                                      .BYTE   M043-M042
    694 003200      035                                      .BYTE   M044-M043
    695 003201      046                                      .BYTE   M045-M044
    696 003202      037                                      .BYTE   M046-M045
    697 003203      023                                      .BYTE   M047-M046
    698 003204      033                                      .BYTE   M050-M047
    699 003205      030                                      .BYTE   M051-M050
    700 003206      031                                      .BYTE   M052-M051
    701 003207      022                                      .BYTE   M053-M052
    702 003210      025                                      .BYTE   M054-M053
    703 003211      016                                      .BYTE   M055-M054
    704 003212      022                                      .BYTE   M056-M055
    705 003213      074                                      .BYTE   M057-M056
    706 003214      012                                      .BYTE   M060-M057
    707 003215      000                                      .BYTE   M061-M060
    708 003216      010                                      .BYTE   M062-M061
    709 003217      002                                      .BYTE   M063-M062
    710 003220      013                                      .BYTE   M064-M063
    711 003221      041                                      .BYTE   M065-M064
    712 003222      003                                      .BYTE   M066-M065
    713 003223      026                                      .BYTE   M067-M066
    714 003224      061                                      .BYTE   M070-M067
    715 003225      010                                      .BYTE   M071-M070
    716 003226      003                                      .BYTE   M072-M071
    717 003227      076                                      .BYTE   M073-M072
    718 003230      002                                      .BYTE   M074-M073
    719 003231      037                                      .BYTE   MEND1-M074
    720 003232      104     145     165     M001:            .ASCIZ  !Deutsch!
        003235      164     163     143
        003240      150     000
    721 003242      077     000             M002:            .ASCIZ  !?!
    722 003244      110     111     114     M003:            .ASCIZ  !HILFE!
        003247      106     105     000
    723 003252      125     122     114     M004:            .ASCIZ  !URLADEN!
        003255      101     104     105
        003260      116     000
    724 003262      114     111     123     M005:            .ASCIZ  !LISTEN!
        003265      124     105     116
        003270      000
    725 003271      177     000             M006:            .ASCIZ  <177>               ;Setup command
    726 003273      177     000             M007:            .ASCIZ  <177>               ;Map command
    727 003275     177      000             M010:    .ASCIZ  <177>           ;Test command
    728 003277                              M011:
    729 003277                              M012:
    730 003277                              M013:
    731 003277                              M014:
    732 003277                              M015:
    733 003277                              M016:
    734 003277                              M017:
    735 003277     107      145      162    M020:    .ASCII  !Geraetename Geraetenummern Beschreibung!<CR>
        003302     141      145      164
        003305     145      156      141
        003310     155      145      040
        003313     107      145      162
        003316     141      145      164
        003321     145      156      165
        003324     155      155      145
        003327     162      156      040
        003332     102      145      163
        003335     143      150      162
        003340     145      151      142
        003343     165      156      147
        003346     015
    736 003347     114      141      144    M021:    .ASCII  !Ladeprogramme auflisten!<CR>
        003352     145      160      162
        003355     157      147      162
        003360     141      155      155
        003363     145      040      141
        003366     165      146      154
        003371     151      163      164
        003374     145      156      015
    737 003377     123      171      163    M022:    .ASCII  !Systemstart von !
        003402     164      145      155
        003405     163      164      141
        003410     162      164      040
        003413     166      157      156
        003416     040
    738 003417     015      113      157    M023:    .ASCII  <CR>!Kommando  Beschreibung!<CR><CR>!URLADEN   System von Ger!
        003422     155      155      141
        003425     156      144      157
        003430     040      040      102
        003433     145      163      143
        003436     150      162      145
        003441     151      142      165
        003444     156      147      015
        003447     015      125      122
        003452     114      101      104
        003455     105      116      040
        003460     040      040      123
        003463     171      163      164
        003466     145      155      040
        003471     166      157      156
        003474     040      107      145
        003477     162
    739 003500     141      145      164             .ASCII  !aet laden und starten!<CR>!LISTEN    !
        003503     040      154      141
        003506     144      145      156
        003511     040      165      156
        003514    144    040    163
        003517    164    141    162
        003522    164    145    156
        003525    015    114    111
        003530    123    124    105
        003533    116    040    040
        003536    040    040
    740 003540    015    114    141   M024:    .ASCII  <CR>!Ladeversuch mit !
        003543    144    145    166
        003546    145    162    163
        003551    165    143    150
        003554    040    155    151
        003557    164    040
    741 003561    057                  M025:    .ASCII  '/'
    742 003562    104    162    165   M026:    .ASCII  !Druecken Sie die Wagenruecklauftaste: !
        003565    145    143    153
        003570    145    156    040
        003573    123    151    145
        003576    040    144    151
        003601    145    040    127
        003604    141    147    145
        003607    156    162    165
        003612    145    143    153
        003615    154    141    165
        003620    146    164    141
        003623    163    164    145
        003626    072    040
    743 003630    106    145    150   M027:    .ASCII  !Fehler !
        003633    154    145    162
        003636    040
    744 003637    040    101    144   M030:    .ASCII  ! Adresse !
        003642    162    145    163
        003645    163    145    040
    745 003650    124    145    163   M031:    .ASCII  !Test laeuft!
        003653    164    040    154
        003656    141    145    165
        003661    146    164
    746 003663    060    055          M032:    .ASCII  /0-/
    747 003665    015    107    145   M033:    .ASCII  <CR>!Geben Sie ein Kommando ein und druecken Sie <WR>: !
        003670    142    145    156
        003673    040    123    151
        003676    145    040    145
        003701    151    156    040
        003704    113    157    155
        003707    155    141    156
        003712    144    157    040
        003715    145    151    156
        003720    040    165    156
        003723    144    040    144
        003726    162    165    145
        003731    143    153    145
        003734    156    040    123
        003737    151    145    040
        003742    074    127    122
        003745    076    072    040
    748 003750                         M034:
    749 003750    011                  M035:    .BYTE   TAB
    750 003751                               M036:
    751 003751      015      040             M037:   .BYTE   CR,SPACE
    752 003753      122      117      115    M040:   .ASCII  !ROM-Urladung wird gestartet!
        003756      055      125      162
        003761      154      141      144
        003764      165      156      147
        003767      040      167      151
        003772      162      144      040
        003775      147      145      163
        004000      164      141      162
        004003      164      145      164
    753 004006                               M041:
    754 004006      015      115      145    M042:   .ASCII  <CR>!Meldung 06!<CR>
        004011      154      144      165
        004014      156      147      040
        004017      060      066      015
    755 004022      114      141      165    M043:   .ASCII  !Laufwerk nicht betriebsbereit!
        004025      146      167      145
        004030      162      153      040
        004033      156      151      143
        004036      150      164      040
        004041      142      145      164
        004044      162      151      145
        004047      142      163      142
        004052      145      162      145
        004055      151      164
    756 004057      104      141      164    M044:   .ASCII  !Datentraeger kann nicht geladen werden!
        004062      145      156      164
        004065      162      141      145
        004070      147      145      162
        004073      040      153      141
        004076      156      156      040
        004101      156      151      143
        004104      150      164      040
        004107      147      145      154
        004112      141      144      145
        004115      156      040      167
        004120      145      162      144
        004123      145      156
    757 004125      113      145      151    M045:   .ASCII  !Keine Platte/Diskette eingelegt!
        004130      156      145      040
        004133      120      154      141
        004136      164      164      145
        004141      057      104      151
        004144      163      153      145
        004147      164      164      145
        004152      040      145      151
        004155      156      147      145
        004160      154      145      147
        004163      164
    758 004164      113      145      151    M046:   .ASCII  !Kein Band eingelegt!
        004167      156      040      102
        004172      141      156      144
        004175      040      145      151
        004200      156      147      145
        004203      154      145      147
        004206      164
    759 004207       123       164       145  M047:    .ASCII  !Steuermodul nicht vorhanden!
        004212       165       145       162
        004215       155       157       144
        004220       165       154       040
        004223       156       151       143
        004226       150       164       040
        004231       166       157       162
        004234       150       141       156
        004237       144       145       156
    760 004242       114       141       165  M050:    .ASCII  !Laufwerk nicht vorhanden!
        004245       146       167       145
        004250       162       153       040
        004253       156       151       143
        004256       150       164       040
        004261       166       157       162
        004264       150       141       156
        004267       144       145       156
    761 004272       125       156       147  M051:    .ASCII  !Ungueltige Geraetenummer !
        004275       165       145       154
        004300       164       151       147
        004303       145       040       107
        004306       145       162       141
        004311       145       164       145
        004314       156       165       155
        004317       155       145       162
        004322       040
    762 004323       125       156       147  M052:    .ASCII  !Ungueltiges Geraet!
        004326       165       145       154
        004331       164       151       147
        004334       145       163       040
        004337       107       145       162
        004342       141       145       164
    763 004345       106       145       150  M053:    .ASCII  !Fehler im Steuermodul!
        004350       154       145       162
        004353       040       151       155
        004356       040       123       164
        004361       145       165       145
        004364       162       155       157
        004367       144       165       154
    764 004372       114       141       165  M054:    .ASCII  !Laufwerkfehler!
        004375       146       167       145
        004400       162       153       146
        004403       145       150       154
        004406       145       162
    765 004410       015       015       125  M055:    .ASCII  <CR><CR>!Urladung laeuft !
        004413       162       154       141
        004416       144       165       156
        004421       147       040       154
        004424       141       145       165
        004427       146       164       040
    766 004432       015       123       151  M056:    .ASCII  <CR>!Siehe Systemhandbuch, Abschnitt Fehlersuche und -behebun!
        004435       145       150       145
        004440       040       123       171
        004443       163       164       145
        004446       155       150       141
        004451       156       144       142
        004454       165       143       150
        004457    054    040    101
        004462    142    163    143
        004465    150    156    151
        004470    164    164    040
        004473    106    145    150
        004476    154    145    162
        004501    163    165    143
        004504    150    145    040
        004507    165    156    144
        004512    040    055    142
        004515    145    150    145
        004520    142    165    156
    767 004523    147    015    015             .ASCII  !g!<CR><CR>
    768 004526    033    133    062    M057:    .ASCII  <ESC>/[2J/        ;Erase screen
        004531    112
    769 004532    033    133    065             .ASCII  <ESC>/[5;0H/      ;Set cursor to line 5 and col 1
        004535    073    060    110
    770 004540                         M060:
    771 004540    115    145    154    M061:    .ASCII  !Meldung !
        004543    144    165    156
        004546    147    040
    772 004550    015    015           M062:    .BYTE   CR,CR
    773 004552    015    015    113    M063:    .ASCII  <CR><CR>/KDJ11-B >/
        004555    104    112    061
        004560    061    055    102
        004563    040    076
    774 004565    015    106    145    M064:    .ASCII  <CR>!Fehler im EEPROM-Urladeprogramm!<CR>
        004570    150    154    145
        004573    162    040    151
        004576    155    040    105
        004601    105    120    122
        004604    117    115    055
        004607    125    162    154
        004612    141    144    145
        004615    160    162    157
        004620    147    162    141
        004623    155    155    015
    775 004626    010    040    010    M065:    .BYTE   BACKSP,SPACE,BACKSP
    776 004631    015    125    156    M066:    .ASCII  <CR>!Ungueltiges Kommando!<CR>
        004634    147    165    145
        004637    154    164    151
        004642    147    145    163
        004645    040    113    157
        004650    155    155    141
        004653    156    144    157
        004656    015
    777 004657    015    015    115    M067:    .ASCII  <CR><CR>!Moegliche Kommandos: HILFE, URLADEN und LISTEN.!
        004662    157    145    147
        004665    154    151    143
        004670    150    145    040
        004673    113    157    155
        004676    155    141    156
        004701    144    157    163
        004704    072    040    110
        004707    111    114    106
        004712    105    054    040
        004715    125    122    114
        004720     101     104     105
        004723     116     040     165
        004726     156     144     040
        004731     114     111     123
        004734     124     105     116
        004737     056
    778 004740     101     144     162  M070:   .ASCII  !Adresse !
        004743     145     163     163
        004746     145     040
    779 004750     040     075     040  M071:   .ASCII  / = /
    780 004753     107     145     142  M072:   .ASCII  !Geben Sie Geraetename und -nummmer ein und druecken Sie <WR>!
        004756     145     156     040
        004761     123     151     145
        004764     040     107     145
        004767     162     141     145
        004772     164     145     156
        004775     141     155     145
        005000     040     165     156
        005003     144     040     055
        005006     156     165     155
        005011     155     155     145
        005014     162     040     145
        005017     151     156     040
        005022     165     156     144
        005025     040     144     162
        005030     165     145     143
        005033     153     145     156
        005036     040     123     151
        005041     145     040     074
        005044     127     122     076
    781 005047     072     040                   .ASCII  !: !
    782 005051     011     011          M073:   .ASCII  <TAB><TAB>
    783 005053     015     101     165  M074:   .ASCII  <CR>!Automatische Urladung beginnt!<CR>
        005056     164     157     155
        005061     141     164     151
        005064     163     143     150
        005067     145     040     125
        005072     162     154     141
        005075     144     165     156
        005100     147     040     142
        005103     145     147     151
        005106     156     156     164
        005111     015
    784 005112                          MEND1:
    785                                 .SBTTL  NULL DICTIONARY BLOCK, CHECKSUM AND LANGUAGE HEADER
    786 005112                          wb:
    787 005112     001                  ENGWRD: .BYTE   ENDBLK-ENGWRD
    788 005113                          ENDBLK:
    789
    790
    791 005113                          WEND:
    792
    793 005113     000                  CKSUM:  .byte   0       ;checksum
    794
    795
    796 005114                          MEND:                           ;END OF NULL TEXT
    797
    798 005114                      ME:
    799 005114                      WE:
    800
    801                             ;FOREIGN LANGUAGE HEADER
    802
    803         000002              B1      =       WE-WB&377                       ;DICTIONARY BYTE COUNT 7:0
    804         000000              B2      =       WE-WB&17400/256.                ;DICTIONARY BYTE COUNT 10:8
    805         000357              B3      =       MEND-text&377                   ;TEXT BYTE COUNT 7:0
    806         000143              B4      =       MEND-text&017400/256.!140       ;TEXT BYTE COUNT 12:8 & ID=011
    807
    808 005114     002                      .BYTE   B1
    809 005115     000                      .BYTE   B2
    810 005116     357                      .BYTE   B3
    811 005117     143                      .BYTE   B4
    812 005120     254                      .BYTE   -<B1+B2+B3+B4>&377              ;THIS BYTE IS HEADER CHECKSUM
    813
    814 005121                      FLEND:
    815 005121                      BUFF:           ;TEMPORARY SAVE AREA FOR OLD AREA
    816         001000                      .END    START
```

```
Symbol table

BACKSP= 000010          FLEND   005121          M010    003275          M042    004006          M074    005053
BCSR  = 177520          FMSG1   002430          M011    003277          M043    004022          NARGS = 000001
BDR   = 177524          FMSG1A  002465          M012    003277          M044    004057          NTYPE = 000027
BIT6  = 000100          FMSG1B  002500          M013    003277          M045    004125          OLDSIZ  002424
BIT7  = 000200          FMSG1C  002531          M014    003277          M046    004164          PCR   = 177522
BUFF    005121          FMSG1D  002554          M015    003277          M047    004207          PCRLB = 177522
B1    = 000002          FMSG2   002563          M016    003277          M050    004242          QUIT    002004
B2    = 000000          FMSG3   002644          M017    003277          M051    004272          QUIT1   002006
B3    = 000357          FMSG4   002737          M020    003277          M052    004323          REAROM  002314
B4    = 000143          LANG    001262          M021    003347          M053    004345          RETRY = 000002
CKSUM   005113          LF    = 000012          M022    003377          M054    004372          RMVTST= 173002
CR    = 000015          LNGHDR= 000140          M023    003417          M055    004410          ROMADR  002342
CRLF    002560          MAXERR= 000004          M024    003540          M056    004432          ROMSZ = 001764
DELAY = 025370          ME      005114          M025    003561          M057    004526          SPACE = 000040
DUMMY1  002526          MEND    005114          M026    003562          M060    004540          START   001000
DUMMY2  002551          MEND1   005112          M027    003630          M061    004540          TAB   = 000011
ENDBLK  005113          MOVROM  002134          M030    003637          M062    004550          TEXT    003135
ENDE2R= 166000          MSG000  003006          M031    003650          M063    004552          UFDHDR= 000040
ENGWRD  005112          MSG001  003070          M032    003663          M064    004565          UFDSIZ  002426
ESC   = 000033          M001    003232          M033    003665          M065    004626          WB      005112
EXIT    001566          M002    003242          M034    003750          M066    004631          WE      005114
EXIT1   001642          M003    003244          M035    003750          M067    004657          WEND    005113
E2LLB = 165006          M004    003252          M036    003751          M070    004740          WERR    002422
E2PAR = 165316          M005    003262          M037    003751          M071    004750          WRBYTE  002162
E2PROM= 165000          M006    003271          M040    003753          M072    004753          WRLANG  001462
E2WRIT  001666          M007    003273          M041    004006          M073    005051

. ABS.  005121    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: 8558 Words  ( 34 Pages)
Size of core pool: 19402 Words  ( 74 Pages)
Operating  system: RSX-11M/PLUS (Under VAX/VMS)

Elapsed time: 00:00:26.22
OEEDA0.BIC,COEEDA0/CR/-SP=COEEDA0
```

M2

```
COEEDAO    CREATED BY  MACRO  ON 16-FEB-85 AT 13:55     PAGE 1

SYMBOL CROSS REFERENCE                                  CREF    V02                                        SEQ 0025

SYMBOL   VALUE             REFERENCES

BACKSP  = 000010    #5-260     6-775     6-775
BCSR    = 177520    #5-239     6-315    *6-316    *6-473
BDR     = 177524    #5-254
BIT6    = 000100    #5-258     6-510     6-531
BIT7    = 000200    #5-257     6-452     6-458     6-461
BUFF      005121     6-370     6-409     6-413     6-441     6-518    #6-815
B1      = 000002    #6-803     6-808     6-812
B2      = 000000    #6-804     6-809     6-812
B3      = 000357    #6-805     6-810     6-812
B4      = 000143    #6-806     6-811     6-812
CKSUM     005113     6-428     6-497    *6-500    #6-793
CR      = 000015    #5-255     6-641     6-648     6-649     6-650     6-651     6-653     6-654     6-735
                     6-736     6-738     6-738     6-738     6-739     6-740     6-747     6-751     6-754
                     6-754     6-765     6-765     6-766     6-767     6-767     6-772     6-772     6-773
                     6-773     6-774     6-774     6-776     6-776     6-777     6-777     6-783     6-783
CRLF      002560     6-471     6-471    #6-648
DELAY   = 025370    #5-247     6-562
DUMMY1    002526     6-575     6-575    #6-642
DUMMY2    002551     6-579     6-579    #6-645
ENDBLK    005113     6-787    #6-788
ENDE2R  = 166000    #5-245     6-349     6-503     6-523     6-596
ENGWRD    005112    #6-787     6-787
ESC     = 000033    #5-262     6-768     6-769
EXIT      001566    #6-455     6-532     6-534
EXIT1     001642     6-460     6-465    #6-471     6-514     6-529
E2LLB   = 165006    #5-244     6-456
E2PAR   = 165316    #5-243     6-466
E2PROM  = 165000    #5-242     5-243     5-244     5-245     6-324     6-333     6-335     6-505     6-525
                     6-598     6-618     6-623
E2WRIT    001666     6-443     6-449    #6-477
FLEND     005121     5-264    #6-814
FMSG1     002430     6-573     6-573    #6-638
FMSG1A    002465    *6-570    #6-639
FMSG1B    002500     6-572     6-572    #6-640
FMSG1C    002531     6-576     6-576    #6-643
FMSG1D    002554     6-580     6-580    #6-646
FMSG2     002563     6-321     6-321    #6-649
FMSG3     002644     6-344     6-344    #6-650
FMSG4     002737     6-337     6-337    #6-651
LANG      001262     6-368    #6-380
LF      = 000012    #5-256     6-641     6-648     6-649     6-650     6-651
LNGHDR  = 000140    #5-248     6-380
MAXERR  = 000004    #5-252     6-481
ME        005114    #6-798
MEND      005114    #6-796     6-805     6-806
MEND1     005112     6-487     6-719    #6-784
MOVROM    002134     6-371     6-410     6-417    #6-547
MSG000    003006     6-512     6-512    #6-653
MSG001    003070     6-533     6-533    #6-654
M001      003232     6-484     6-659     6-660    #6-720
M002      003242     6-660     6-661    #6-721
M003      003244     6-661     6-662    #6-722
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SYMBOL CROSS REFERENCE                                   CREF   V02

SYMBOL  VALUE          REFERENCES

M004      003252        6-662      6-663     #6-723
M005      003262        6-663      6-664     #6-724
M006      003271        6-664      6-665     #6-725
M007      003273        6-665      6-666     #6-726
M010      003275        6-666      6-667     #6-727
M011      003277        6-667      6-668     #6-728
M012      003277        6-668      6-669     #6-729
M013      003277        6-669      6-670     #6-730
M014      003277        6-670      6-671     #6-731
M015      003277        6-671      6-672     #6-732
M016      003277        6-672      6-673     #6-733
M017      003277        6-673      6-674     #6-734
M020      003277        6-674      6-675     #6-735
M021      003347        6-675      6-676     #6-736
M022      003377        6-676      6-677     #6-737
M023      003417        6-677      6-678     #6-738
M024      003540        6-678      6-679     #6-740
M025      003561        6-679      6-680     #6-741
M026      003562        6-680      6-681     #6-742
M027      003630        6-681      6-682     #6-743
M030      003637        6-682      6-683     #6-744
M031      003650        6-683      6-684     #6-745
M032      003663        6-684      6-685     #6-746
M033      003665        6-685      6-686     #6-747
M034      003750        6-686      6-687     #6-748
M035      003750        6-687      6-688     #6-749
M036      003751        6-688      6-689     #6-750
M037      003751        6-689      6-690     #6-751
M040      003753        6-690      6-691     #6-752
M041      004006        6-691      6-692     #6-753
M042      004006        6-692      6-693     #6-754
M043      004022        6-693      6-694     #6-755
M044      004057        6-694      6-695     #6-756
M045      004125        6-695      6-696     #6-757
M046      004164        6-696      6-697     #6-758
M047      004207        6-697      6-698     #6-759
M050      004242        6-698      6-699     #6-760
M051      004272        6-699      6-700     #6-761
M052      004323        6-700      6-701     #6-762
M053      004345        6-701      6-702     #6-763
M054      004372        6-702      6-703     #6-764
M055      004410        6-703      6-704     #6-765
M056      004432        6-704      6-705     #6-766
M057      004526        6-705      6-706     #6-768
M060      004540        6-706      6-707     #6-770
M061      004540        6-707      6-708     #6-771
M062      004550        6-708      6-709     #6-772
M063      004552        6-709      6-710     #6-773
M064      004565        6-710      6-711     #6-774
M065      004626        6-711      6-712     #6-775
M066      004631        6-712      6-713     #6-776
M067      004657        6-713      6-714     #6-777
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SYMBOL CROSS REFERENCE                              CREF    V02

SYMBOL   VALUE        REFERENCES

M070       004740       6-714       6-715      #6-778
M071       004750       6-715       6-716      #6-779
M072       004753       6-716       6-717      #6-780
M073       005051       6-717       6-718      #6-782
M074       005053       6-718       6-719      #6-783
NARGS    = 000001      #6-321       6-321      #6-337       6-337      #6-344       6-344      #6-471       6-471      #6-512
                        6-512      #6-533       6-533      #6-572       6-572       6-572      #6-573       6-573      #6-575
                        6-575       6-575      #6-576       6-576      #6-579       6-579       6-579      #6-580       6-580
NTYPE    = 000027      #6-321       6-321      #6-337       6-337      #6-344       6-344      #6-471       6-471      #6-512
                        6-512      #6-533       6-533      #6-572       6-572      #6-573       6-573      #6-575       6-575
                       #6-575       6-575      #6-576       6-576      #6-579       6-579      #6-580       6-580
OLDSIZ     002424      *6-339      *6-376      *6-382       6-408       6-414      *6-416      *6-419       6-513       6-528
                       #6-631
PCR      = 177522      #5-240      *6-314      *6-340      *6-474      *6-506      *6-526      *6-599
PCRLB    = 177522      #5-241      *6-455       6-567      *6-627
QUIT       002004       6-482       6-485       6-488       6-491       6-494      #6-509
QUIT1      002006       6-345      #6-510
REAROM     002314       6-386       6-387       6-388       6-390       6-392       6-551      #6-594
RETRY    = 000002      #5-250       6-560
RMVTST   = 173002      #5-246       6-341
ROMADR     002342       6-384       6-438       6-517       6-548      #6-609
ROMSZ    = 001764      #5-264       6-437       6-447
SPACE    = 000040      #5-261       6-751       6-775
START      001000      #6-314       6-816
TAB      = 000011      #5-259       6-749       6-782       6-782
TEXT       003135       5-264       6-424       6-446      #6-659       6-659       6-805       6-806
UFDHDR   = 000040      #5-249       6-367       6-399
UFDSIZ     002426      *6-377      *6-407      *6-412       6-416      *6-420       6-436       6-439       6-528      #6-633
WB         005112      #6-786       6-803       6-804
WE         005114      #6-799       6-803       6-804
WEND       005113      #6-791
WERR       002422      *6-479       6-481      #6-630
WRBYTE     002162       6-464       6-469       6-477       6-520      #6-557
WRLANG     001462       6-358       6-372       6-378       6-381       6-418      #6-424
```