20.1 CHDU-IDENTIFICATIONS

Type-number: PTS6844, P824-040
Test-programs:

X1215: PERTST, CDDTSC
X1216:

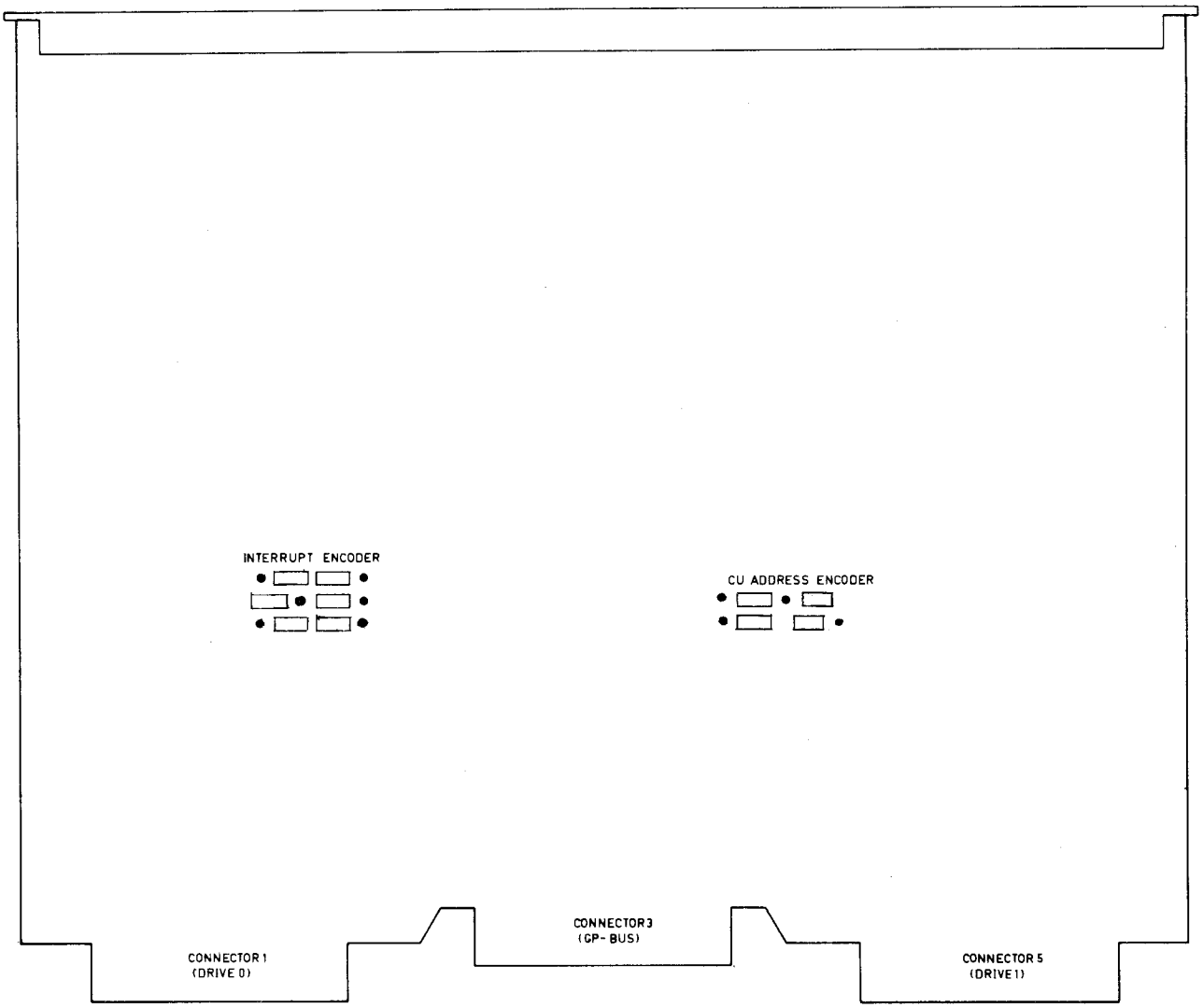
Channel: Hardware channel MX

Break-connection: 3A43

Devices:

2 x X1215 (2.7 Mb) - PTS6875
2 x X1216 (5.4 mb) - PTS6876

Power-consumption: 5 Volt, 4 Amp.



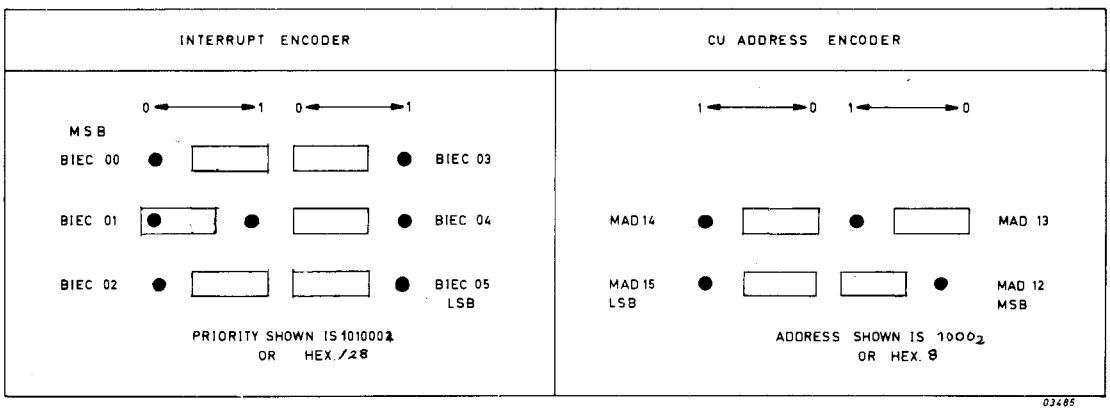


Figure 20.1 ADDRESS AND INTERRUPT ENCODERS

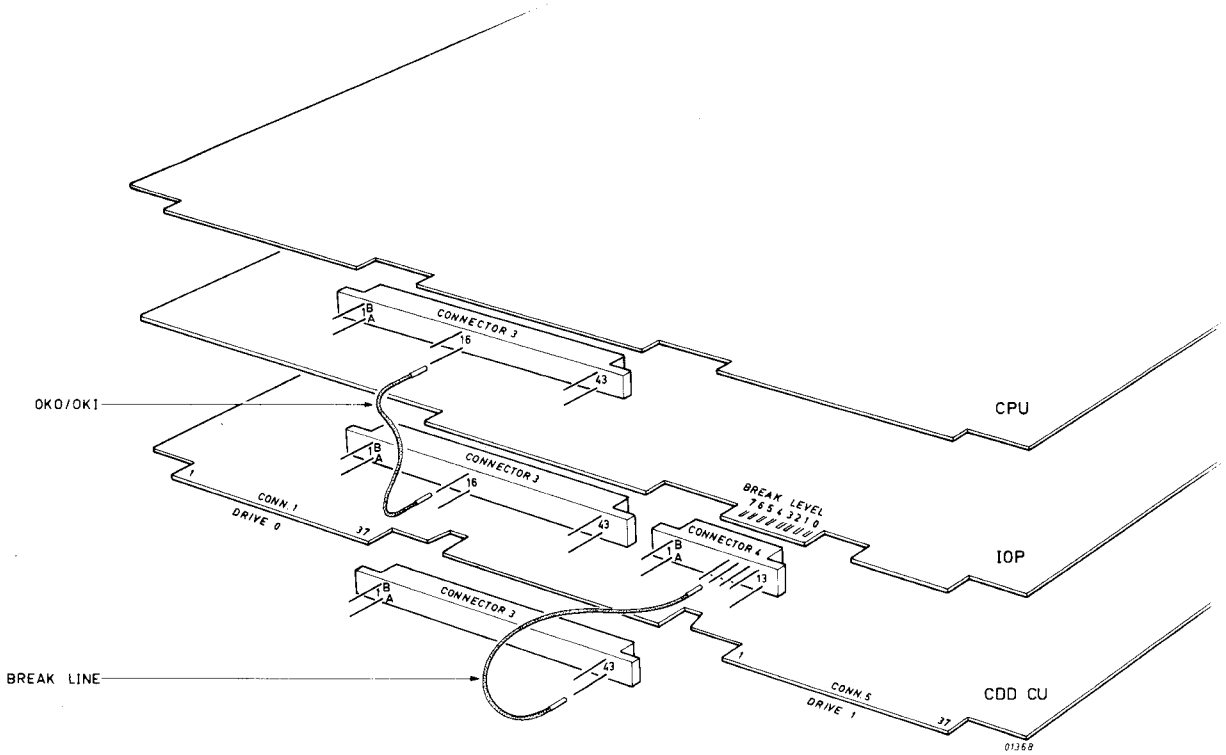
20.3 INTERFACE CONNECTIONS

CONTROL UNIT		DISK DRIVE		
SIGNAL NAME	CONNECTOR PIN	SIGNAL NAME	CONNECTOR PIN	
BUS # 0N	A 25	$\overline{A\ B\ 0}$	48	Lines for cylinder number, CS head selection, HS commands, CTS
SIGNAL GROUND	B 25		51	
BUS # 1N	A 26	$\overline{A\ B\ 1}$	47	
SIGNAL GROUND	B 26		50	
BUS # 2N	A 27	$\overline{A\ B\ 2}$	46	
SIGNAL GROUND	B 27		49	
BUS # 3N	A 13	$\overline{A\ B\ 3}$	54	
SIGNAL GROUND	B 13		57	
BUS # 4N	A 12	$\overline{A\ B\ 4}$	53	
SIGNAL GROUND	B 12		56	
BUS # 5N	A 11	$\overline{A\ B\ 5}$	52	
SIGNAL GROUND	B 11		55	
BUS # 6N	A 35	$\overline{A\ B\ 6}$	60	
SIGNAL GROUND	B 35		64	
BUS # 7N	A 34	$\overline{A\ B\ 7}$	59	
SIGNAL GROUND	B 34		63	
BUS # 8N	A 10	$\overline{A\ B\ 8}$	40	
SIGNAL GROUND	B 10		43	
SEL # N	A 07	$\overline{USL}$	36	unit select
SIGNAL GROUND	B 07		39	
FTCYL # N	A 04	$\overline{C\ S}$	10	cylinder select
SIGNAL GROUND	B 04		13	
FTH # N	A 05	$\overline{H\ S}$	11	head select
SIGNAL GROUND	B 05		14	
FCONT # N	A 33	$\overline{CTS}$	17	control select
SIGNAL GROUND	B 33		21	
WDL # N	A 37	$\overline{WRDA}$	08	write data line
SIGNAL GROUND	B 37		12	
UNSAFE # N	A 03	$\overline{U\ S\ A\ 2}$	34	unit unsafe 2
SIGNAL GROUND	B 03		37	
RER # N	A 02	$\overline{U\ S\ A\ 1}$	03	unit unsafe 1 (rer)
SIGNAL GROUND	B 02		07	
SEC # 0N	A 06	$\overline{S\ P\ C}$	23	sector puls cartr.
SIGNAL GROUND	B 06		26	
SEC # 1N	A 29	$\overline{S\ P\ F}$	30	sector puls fixed
SIGNAL GROUND	B 29		33	
IND # 0N	A 08	$\overline{I\ P\ C}$	24	index puls cartr.
SIGNAL GROUND	B 08		27	
IND # 1N	A 30	$\overline{I\ P\ F}$	35	index puls fixed
SIGNAL GROUND	B 30		38	
RDY # N	A 31	$\overline{U\ R}$	02	unit ready
SIGNAL GROUND	B 31		05	
ONCIL # N	A 32	$\overline{C\ O\ N}$	29	on cylinder
SIGNAL GROUND	B 32		32	
RDL # N	A 36	$\overline{RDDA}$	01	read data line
SIGNAL GROUND	B 36		04	
SEL # N	A 07	$\overline{CUAS}$	58	controller absent
SIGNAL GROUND	B 07		62	
		DRIVE 0	DRIVE 1	
KEY TO SIGNAL NAME: #		0	1	
CONTROL UNIT CONNECTOR		1	5	

CONTROL UNIT to DISK DRIVE INTERFACE CONNECTIONS

Table 20.1 CONTROL UNIT TO DISK DRIVE INTERFACE CONNECTIONS

Example showing the CPU, IOP and Disk CU installed in the CPU cabinet. OKO/OKI connection shown in correct for IOP with address 0. Break line shown is correct for Disk CU with address 8.



BREAK LEVELS	0	1	2	3	4	5	6	7
IOP CONN. 4 B	13	12	11	10	9	8	7	6

Figure 20.1a CONNECTION ON HARDWARE CHANNEL (6810,12,13)

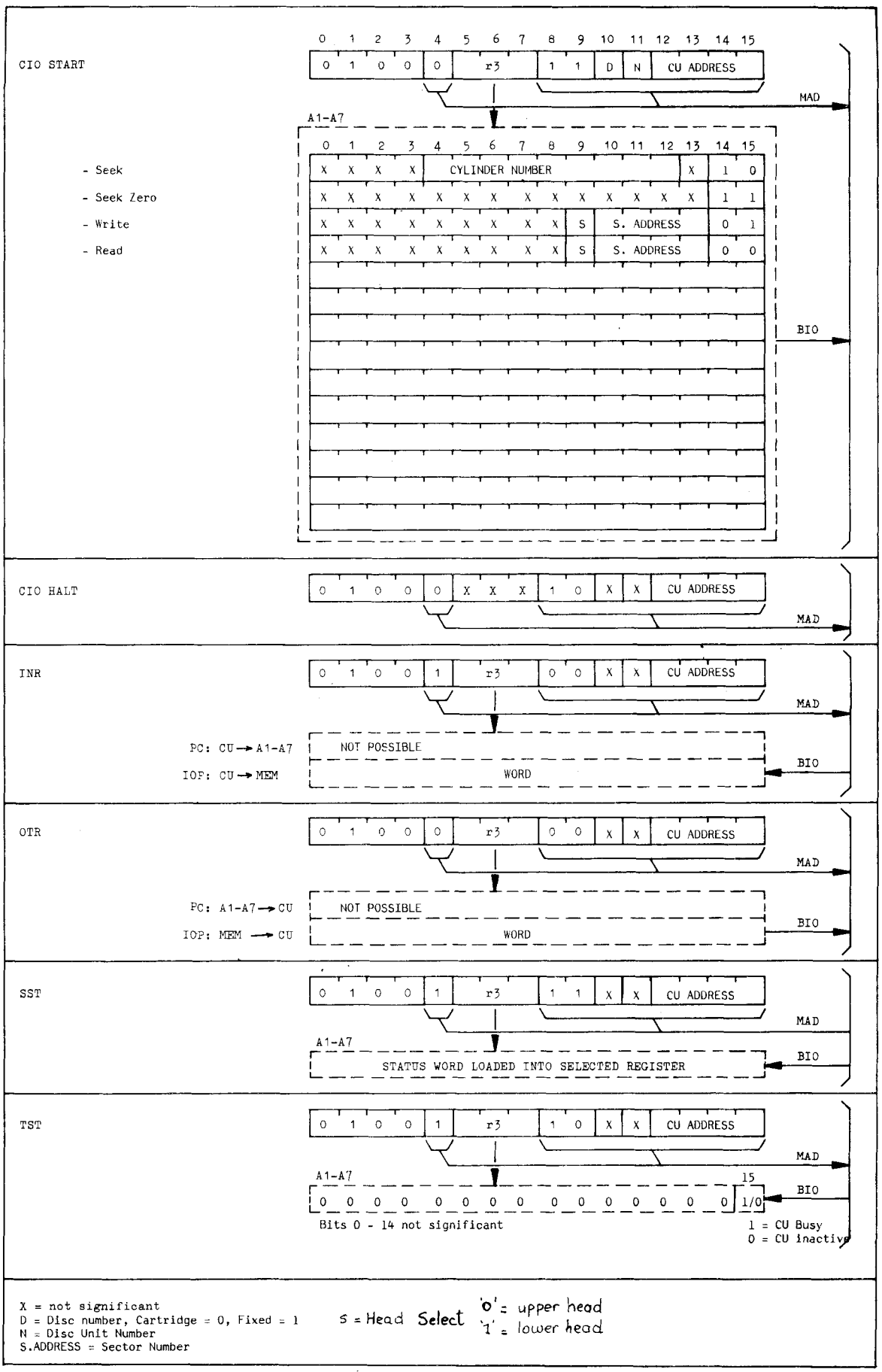
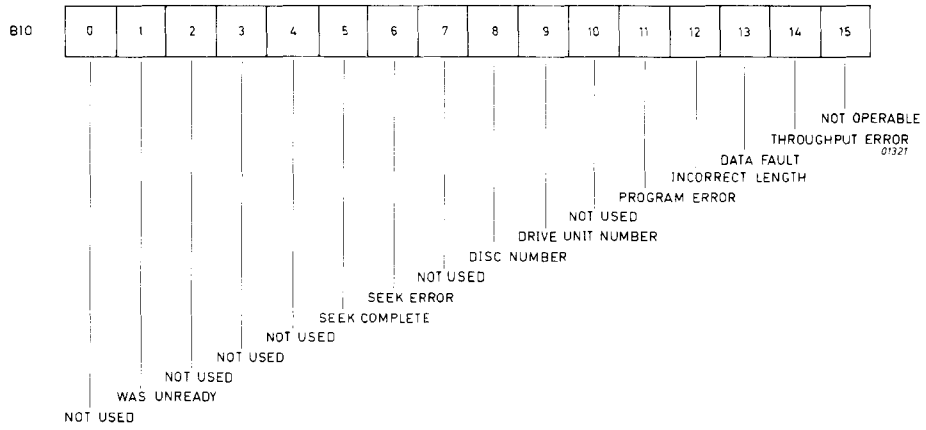


Figure 20.2 INSTRUCTION-/COMMAND-WORD FORMATS

20.4.1 STATUS-WORD



Bit 15 Not operable - is set if the drive (indicated in bit 9) is not operable.

Bit 14 Throughput Error - is set during a write operation if both words in the Input Data Buffer have been written to disc and serialization of the current word is completed before the IOP has answered the exchange data request with an OTR. It is set during a read operation if neither word in the Read Data Buffer have been transferred to memory and deserialization of the current word has ended before the IOP has answered the exchange data request with an INR.

Bit 13 Data Fault - is set when the LRC check fails at the end of a read operation.

Bit 12 Incorrect Length - is set if a read or write operation is incomplete when the start of the next physical sector is detected, by means of the sector pulse.

Bit 11 Program Error - is set if the CU receives an OTR command during a read operation or an INR during a write operation.

Bit 9 Drive Unit Number - is set for drive number 1.

Bit 8 Disc Number - is set for the fixed disc. The disc number is valid only after a read or write operation, after a seek or ready interrupt bit 8 will always be zero.

Bit 6 Seek Error - is set if an error has been detected or the drive becomes inoperable during a seek operation.

Bit 5 Seek Complete - is set if the seek operation is complete whether or not errors were detected.

Bit 1 Was Unready - is set if during scanning a change of status has occured from not operable to operable.

20.5 SHORT DESCRIPTION TESTPROGRAM

Codes: 50 - 59 PERTEST for disc drive 1
60 - 69 for disc drive 2

User instruction

General

Cartridge disc drive test program, CDDTSC, performs a complete test of

- CDD 6875 2 x 2.5 Mbyte
- CDD 6876 2 x 5 Mbyte

The test program can be run on all PTS 6000 computers (except TC6110).

The pre-released version of the CDDTSC is only intended to be a GO/NOGO test of the cartridge or the fix disc. All control and communication facilities are located to the SOP panel to exclude the need of special test system configurations (e g CTW).

The test is power failure proof.

Warning! Use of fix disc test might easily destroy the contents on the disc.

Program loading

The program is available as a stand-alone program on cassette and the loading procedure is as normal, see appendix 1 "PTS 6000 - Program loading". After correct loading the SOP indicator 1 is lit up.

Program initiation

1) Use the SOP panel (see appendix 2) to select if any of the cartridge discs, drive 0 or 1, should be tested.

2) If no test of cartridge disc is selected, it is possible to select test of any of the fix discs, drive 0 or 1.

   Warning! Data on fix disc can easily be destroyed using this test.

3) The program is initiated with the following default values that are normally used:

   Interrupt level = 40 (101000)
   CU address = 8 (not changeable)

   If change of interrupt level is required, input the disc unit interrupt level used in the present system (see appendix 2).

Program execution

4) Start the test (SOP indicator 1 is turned off)

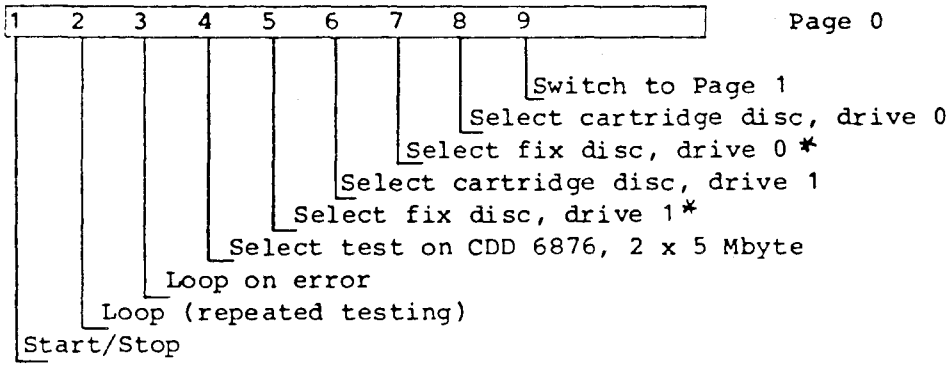
5) If no error is detected, the test will stop after about 10 minutes and SOP indicator 1 will light up again.

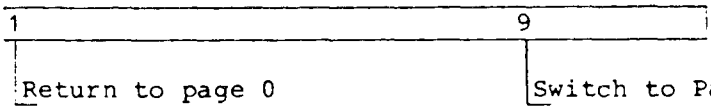
   If an error is detected the testing will stop and the SOP indicators 9-11 will light up. For error description or restart of testprogram see appendix 3 "SOP handling - error condition".

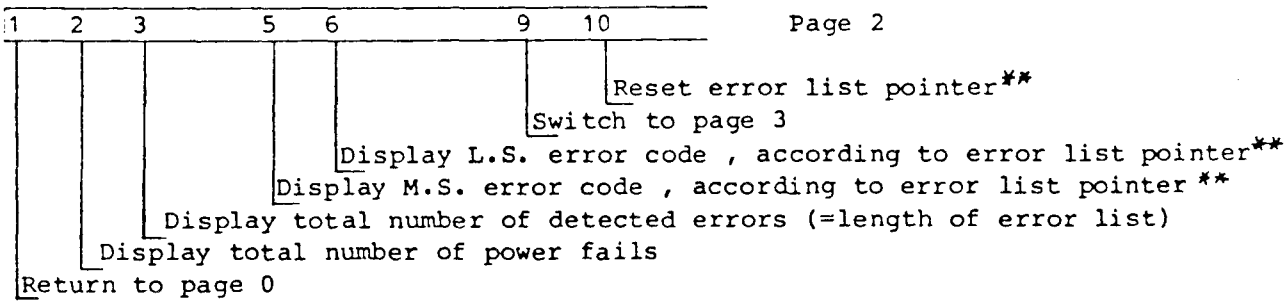
SOP-handling - program execution

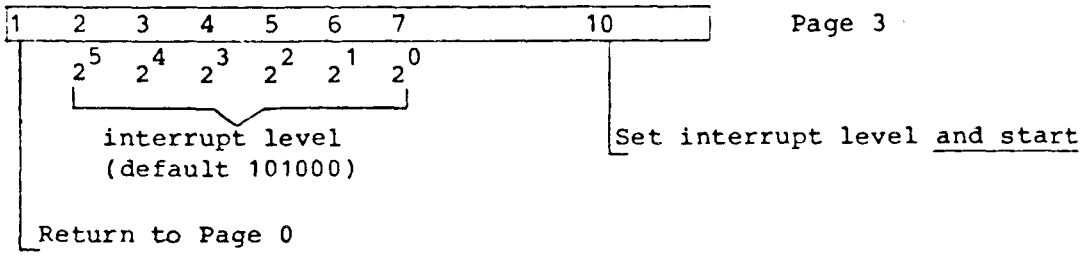
Page 0 is initiated in the following cases:

- after program loading
- after a complete test
- after return command from other pages







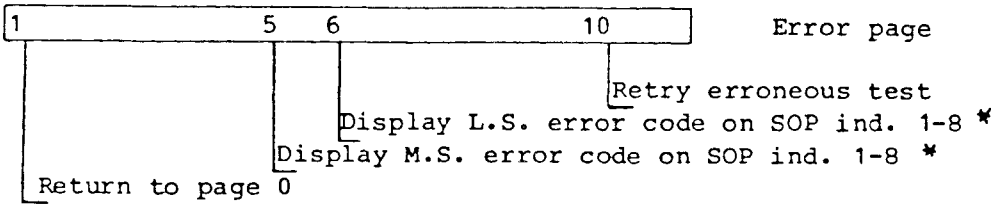


*) Warning! Data on fix disc might be destroyd using fix disc test.

**) All detected errors during the test are logged in an error list. The error codes are the same as used in the old version of CDDTST that includes CTW and CFP.

SOP handling - error condition

When the test program detects an error the SOP indicators 9, 10 and 11 light up. The SOP switches will then have the following function.



*) The error codes are the same as used in the old version of CDDTST that includes CTW and CFP.

20.6 SHORT ROUTINES

```
         DATE  82-05-05        IDENT    SEEK      FOR PTS


0000                           IDENT    SEEK                  FOR PTS
0001                    *DATE: 820505 FOR PTS
0002                    * PROGRAM USABLE INSTEAD OF AN EXERSISER
0003
0004                    *       LOAD START CYLINDER IN REG A1
0005                    *       LOAD LAST CYLINDER IN REG A2
0006                    *       LOAD STEPPING INCREMENT IN REG A3
0007                    *       LOAD TIME DELAY IN REG A6
0008                    *       DISC DRIVE 0 IS ADDRESSED  OTHERWISE CHAGE DEVICE ADDRESSES
0009
0010                           AORG     /80
0011 0080 FFFF                 DATA     /FFFF
0012 0082 0000                 DATA     0
0013 0084 207F          START  HLT
0014 0086 20BF                 INH
0015 0088 8404          CIO    LDR      A4,A1
0016 008A 3C43          CIO1   SLL      A4,3
0017 008C 1402                 ADK      A4,2
0018 008E 44C8                 CIO      A4,1,8
0019 0090 4DC8                 SST      A5,8
0020 0092 5C04                 RB(4)    *-2
0021 0094 E718                 ECR      A7,A6
0022 0096 1F01                 SUK      A7,1
0023 0098 5E04                 RB(6)    *-2
0024 009A ED20 0400            CWK      A5,/400
0025 009E 5002                 RF(0)    CONT
0026 00A0 207F                 HLT                            STATUS ERROR SEE A5
0027 00A2 3C63          CONT   SRL      A4,3
0028 00A4 940C                 ADR      A4,A3
0029 00A6 EC08                 CWR      A4,A2
0030 00A8 5922                 RB(1)    CIO
0031 00AA 5F22                 RB       CIO1
0032
0033                           EJECT
0034                    *EXAMPLE
0035                    *FOR CERTAIN ADJUSTMENTS SEEK FROM 0 TO 64 IN LOOP
0036                    *LOAD THE REGISTERS AS FOLLOWS:
0037                    *       LOAD A1 WITH 0
0038                    *       LOAD A2 WITH 64 DEC = /40
0039                    *       LOAD A3 WITH 64 DEC = /40
0040                    *       LOAD A6 WITH  /40 ( MAX VALUE IN A6 = /80)
0041                    *               (/40= 64 DEC IS ABOUT A DELAY OF 64 MSEC)
0042
0043                    *       LOAD START ADDRESS IN A0
0044                    *       PUSH  MC AND RUN
0045
0046                    *NOTE   WITH INST YOU CAN STOP THE PROGRAM AND IT IS
0047                    *       POSSIBLE TO CHANGE THE PARAMETERS, PUSH RUN AND
0048                    *       THE PRORAM WILL RUN FOR THE CANGED PARAMETERS
0049
0050                           END      START


          SYMBOL TABLE

   CIO     0088  A   CIO1    008A  A   CONT    00A2  A   START   0084  A


          ASS.ERR.    0000
:EOF
PROG ELAPSED TIME:  00H-00M-13S-340MS-
```

```
         DATE  82-05-05        IDENT    DISKTS


0000                           IDENT    DISKTS
0001                    *DATE: 820505 FOR PTS
0002                    *PROGRAM FOR READING AND WRITING ON DISC
0003                    *PUT THE PATTERN YOU WANT READ AND WRITE IN A5, BEFORE RUNNING THE PROGRAM
0004                    *IF THE PROGRAM STOPS YOU FIND THE WRITTEN WORD IN A3 AND THE READ WORD IN A4
0005                    *IN A2 IS THE POSITION OF THE WORDS IN THE DATA BUFFERS
0006                    *AFTERWARDS YOU FIND THE STATUS IN A6.
0007                    *
0008                    *
0009                           AORG     /80
0010       0008        DA      EQU      /08                  DEVICE ADDR. DISC
0011       0010        ER1     EQU      /10                  FIRST EXTERNAL REGISTER
0012       0011        ER2     EQU      /11                  SECOND EXTERNAL REGISTER
0013                    *
0014                    *MAIN PROGRAM
0015 0080 FFFF                 DATA     /FFFF
0016 0082 0000                 DATA     0
0017 0084 207F          START  HLT
0018 0086 87A0 0780            LDKL     A15,EOS              LOAD STACKPOINTER
0019 008A 8120 00F4            LDKL     A1,INTROU            ADDR. INTERRUPTROUTINE
0020 008E 8141 0050            ST       A1,/50
0021 0092 0200          LOAD   LDK      A2,0
0022 0094 8549 00FA     STORE  ST       A5,DATAIN,A2         WRITE BUFFER
0023 0098 1202                 ADK      A2,2
0024 009A EA20 019A            CWK      A2,/19A
0025 009E 5C0C                 RB(4)    STORE
0026 00A0 8120 C0CD            LDKL     A1,/C0CD             WER CONTROL WORD 1
0027 00A4 7110                 WER      A1,ER1
0028 00A6 8120 00FA            LDKL     A1,DATAIN            WER CONTROL WORD 2
0029 00AA 7111                 WER      A1,ER2
0030 00AC 0101                 LDK      A1,1
0031 00AE 41C8                 CIO      A1,1,DA              START WRITE
0032 00B0 5C04                 RB(4)    *-2
0033 00B2 4F88          WAIT   TST      A7,DA
0034 00B4 EF20 0000            CWK      A7,0
0035 00B8 5C08                 RB(4)    WAIT
0036 00BA 8120 80CD            LDKL     A1,/80CD             WER CONTROL WORD 1
0037 00BE 7110                 WER      A1,ER1
0038 00C0 8120 043A            LDKL     A1,DATAOT            WER CONTROL WORD 2
0039 00C4 7111                 WER      A1,ER2
0040 00C6 0100                 LDK      A1,0
0041 00C8 41C8                 CIO      A1,1,DA              START READ
0042 00CA 5C04                 RB(4)    *-2
0043 00CC 4F88          WAITAG TST      A7,DA
0044 00CE EF20 0000            CWK      A7,0
0045 00D2 5C08                 RB(4)    WAITAG
0046 00D4 0200                 LDK      A2,0
0047 00D6 8348 00FA     TEST   LD       A3,DATAIN,A2         COMPARE WRITE AND
0048 00DA 8448 043A            LD       A4,DATAOT,A2         READ BUFFER
0049 00DE EB10                 CWR      A3,A4                OK?
0050 00E0 540C                 RF(4)    HALT                 NO STOP
0051 00E2 1202                 ADK      A2,2                 YES GO ON
0052 00E4 EA20 019A            CWK      A2,/19A
0053 00E8 5C14                 RB(4)    TEST
0054 00EA 8F20 0092            ABL(7)   LOAD
0055 00EE 207F          HALT   HLT                           DATA ERROR
0056 00F0 8F20 0092            ABL(7)   LOAD
0057                    *
0058                    *INTERRUPT ROUTINE
0059 00F4 4EC8          INTROU SST      A6,DA                AFTERWARDS STATUS IN A6
0060 00F6 5C04                 RB(4)    *-2
0061 00F8 F03E                 RTN      A15
0062
0063
0064 00FA               DATAIN RES      /1A0
0065 043A               DATAOT RES      /1A0
0066 077A               STACK  RES      3
0067 0780               EOS    RES      1
0068                           END      START


          SYMBOL TABLE

   DA       0008  A   DATAIN  00FA  A   DATAOT  043A  A   EOS     0780  A
   ER1      0010  A   ER2     0011  A   HALT    00EE  A   INTROU  00F4  A
   LOAD     0092  A   STACK   077A  A   START   0084  A   STORE   0094  A
   TEST     00D6  A   WAIT    00B2  A   WAITAG  00CC  A

          ASS.ERR.     0000
:EOF
PROG ELAPSED TIME:  00H-00M-17S-860MS-
```

```
         DATE  82-05-05        IDENT    DKPROG

0000                           IDENT    DKPROG
0001                    *DATA: 820505 FOR PTS
0002
0003                    *      THIS PROGRAM TESTS READING AND WRITING ON DISC IN
0004                    *      PROGRAMMED CHANNEL
0005
0006                    ****************TAKE OFF BREAKLINE*****************
0007
0008
0009                    *      LOAD WORD TO WRITE IN REGISTER A2
0010                    *      LOAD START ADDRESS (/0086) IN A0 AND PUSH RUN
0011
0012                           AORG     /80
0013
0014 0080 FFFF                 DATA     /FFFF
0015 0082 0000                 DATA     0
0016                    *      WRITE ROUTINE
0017
0018 0084 207F          START  HLT
0019 0086 20BF                 INH
0020 0088 0101                 LDK      A1,1                 WRITE COMMAND ON SECTOR ZERO
0021 008A 41C8                 CIO      A1,1,8               START CONTROLLER
0022 008C 4208                 OTR      A2,0,8               WRITE A2 CONTENTS ON DISC
0023 008E 5C04                 RB(4)    *-2
0024 0090 4188                 CIO      A1,0,8               STOP CONTROLLER
0025 0092 4CC8                 SST      A4,8                 GET STATUS
0026 0094 5C04                 RB(4)    *-2
0027 0096 207F                 HLT                           CHECK STATUS IN A4
0028                    *                                    SOMETIMES THROUGHPUT ERROR IS GIVEN
0029                    *                                    BECAUSE CIO HALT WAS JUST TO LATE
0030
0031
0032                    *      READ ROUTINE
0033 0098 20BF                 INH
0034 009A 0100                 LDK      A1,0                 READ COMMAND ON SECTOR ZERO
0035 009C 41C8                 CIO      A1,1,8               START CONTROLLER
0036 009E 4B48                 INR      A3,1,8               READ WORD
0037 00A0 5C04                 RB(4)    *-2
0038 00A2 4188                 CIO      A1,0,8               STOP CONTROLLER
0039 00A4 4CC8                 SST      A4,8                 GET STATUS
0040 00A6 5C04                 RB(4)    *-2
0041 00A8 207F                 HLT                           STATUS IN A4
0042                                                         READ WORD IN A3
0043 00AA 5F28                 RB       START
0044
0045
0046                           END      START

            SYMBOL TABLE

    START   0084  A

            ASS.ERR.    0000
  :EOF
  PROG ELAPSED TIME:  00H-00M-11S-540MS-
```