

DataBoard 4680[®]

ABC/DTC-NET. System Manual.

 **SATTCO**
DATA OCH KOMPONENTER.

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ABC / DTC - NET MANUAL

for ABC800 / Facit DTC and ABC80

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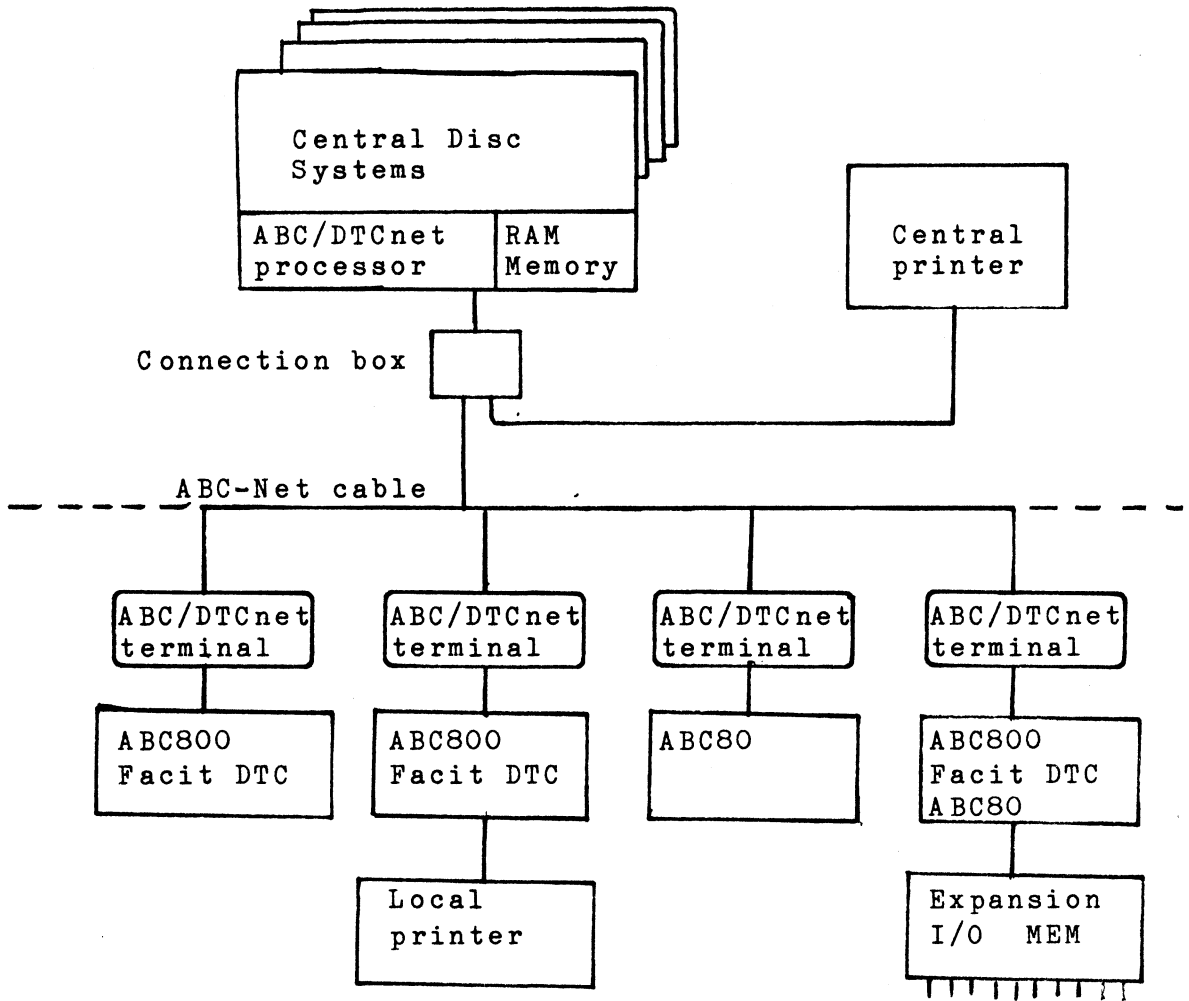
RECORD OF CHANGES

| Date | Pages | Description |
|----------|-------|---------------------------------------|
| 83-05-09 | 6-1 | PR out on pin 9 on CPU-card |
| 83-05-09 | 11-2 | Unit shipped with login 'SU' |
| 83-05-09 | App.2 | Differ. ABC80/ABC800 syst.progr.names |

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1. DESCRIPTION



LARGE CENTRAL DISC STORAGE CAPACITY AND COMMON PRINTER.

The ABC/DTC-net system provides large disc storage capacity and a common printer, with printer buffers on disc. Up to 32 peripheral computer systems can be connected to the central system.

ABC800, Facit DTC and ABC80 computers are connected to the central system through one ABC-Net cable and are simultaneously accessing the entire central disc systems and printer with all normal BASIC routines.

Each connected computer system is independant and sees the central disc drives and printer as normal disc and printer devices.

One, or up to 12, disc devices can be interconnected in the central unit, Winchester drives, 8" Floppy drives and 5 1/4" Mini-floppy drives.(Chapter 2.1)..

USER DIRECTORIES, ACCESS PROTECTION

User directories are defined to subdivide the central discs and prevent users from accessing each other's files. Files can also be individually write protected.

A user log-in procedure is required for access to the ABC/DTC-net system, where passwords may be used for security.

LOCAL PRINTER (ABC800/DTC), LOCAL MEM. OR I/O EXPANSION.

A local printer may be used with each ABC800/Facit DTC system, but not for ABC80.

Each computer system may be expanded with extra memory or interface-cards in a local expansion box.

COMMUNICATION

All communication is through the 3-wire ABC-Net cable, with a maximum total length of 300 m, to which the central unit, as well as each local computer are connected into a multi-drop configuration. To minimize the data transfer over the cable, some utility programs are partly executed within the central system. Efficient use of interrupts permits printing, command execution and data transmission to be done simultaneously.

Data is transfered block-wise in serial form with 19200 Baud.

INITIATING OPTIONS IN CENTRAL UNIT

The ABC/DTC-net system may be initialized at power-on or reset by executing a utility program within the central unit. This could be used to set the V24-printer baudrate or disc parameters.

AUTOSTART OPTION FOR ABC800/DTC

Automatic log-in and/or start of a user program may be selected.

ABC/DTC-NET SYSTEM COMPONENTS

The ABC/DTC-net system consists of the components below, connected to the central disc systems, printer and the peripheral computer systems. At least one floppy or mini-floppy drive is required in the central unit to load the system utility initially. A DataBoard bus is required in the central system with slots for CPU, memory and interfaces.

1. The 7028 central unit.
 - Central processor card with system program in EPROM and interface circuits for the ABC-Net cable and printer(V24/RS232C).
 - A connection box with 1.5 m cable, between the processor card and the printer and the ABC-Net cable.
 - System utility programs on a 8" or 5" diskette.
2. Central memory card with 16 Kbytes. The DataBoard 2009 board is recommended.
2. Terminal boards for each connected computer, including communication programs and DOS- and printer simulation program in EPROM.
 - 7029 for ABC800/Facit DTC
 - 7030 for ABC80, including also a metal box and a 500 mm ribbon cable.
4. User constructed ABC-Net cables between each unit. Chapter 5 describes the connectors and the recommended cable type.

Optionally, a separate interface card may be used for the central printer. In this case, the interrupt signal must be available from the I/O slot used to the central processor slot in the central unit. The recommended cables has the corresponding standard connectors for the printer.

- 4001 Centronic interface
- 4015 SP1 interface (Facit)
- 6116 Cable Centronics
- 6109 Cable SP1

2. SOFTWARE, DOS VERSION 6.xx

2.1 General

The system is software transparent for normal BASIC programs. Each peripheral computer may have up to 6 files open simultaneously, exactly as in a single user system. Files may be accessed sequentially and by random access. Specific sectors on the disc/diskettes can also be accessed through DOS. Note that DOS version 6 is used, with non-biased sector addresses (chapter 2.2).

Special ABC/DTC-net-versions are normally needed for commercial programs, protected against copying.

The local software on the terminal card simulates the normal DOS and printer routines. For ABC800/DTC only, a local printer may be used, in which case the device name PR: is used for the local printer and RPR: for the central. (Chapter 8.1).

Version 6.xx of DOS is used for both ABC800/Facit DTC and for ABC80. DOS version 6 is a general disc handling system for simultaneous control of different types of disc drives.

As standard, the following device names are available:

| | |
|---------------------|--|
| UFD: | own user directory. |
| HDO: HD1: HD2: HD3: | max 4 Winchester devices |
| MFO: MF1: MF2: | max 3 Double Track mini-floppy devices |
| MOO: MO1: | max 2 Single Track mini-floppy devices |
| SFO: SF1: SF2: | max 3 Floppy devices 8" |
| DRO: DR1: DR2: DR3: | directed to the Winchester device |
| PR: | ABC80 Central printer or ABC800/DTC Local printer |
| RPR: | ABC800/DTC Central printer. |

In addition the following local device names are used:

| | |
|----------------|-------------------------|
| CAS: | in ABC80 and ABC800/DTC |
| V24: NUL: CON: | only in ABC800/DTC. |

The normal disc device name DRO:, DR1: etc. is by default directed to the Winchester disc (HDO:, HD1: etc.), but may be changed by the initiating RAMOPT.SYS program to access another drive type.

When the system searches a file, the discs are searched in the default search order, which is the order in the table above.

NOTE! ! NO PATCH AREA is available above OFDOOH as for the earlier DOS.

NOTE! New card select code is used for the 4108 8" floppy interface. Use 56 octal (See sect. 10.5.3).

The default drive parameters are as below. They are also possible to modify at initiation.

| Device name | Card sel. | Cluster size | Type |
|-------------|-----------|--------------|---------------------------------|
| HDx: | 44Q | 32 | Winchester drive |
| MFx: | 54Q | 4 | Double Track 5 1/4" Mini-floppy |
| MOx: | 55Q | 1 | Single Track 5 1/4" Mini-floppy |
| SFx: | 56Q | 4 | Floppy 8" |

2.2 Direct addressing through DOS

Programs, accessing the disc sectors directly through the DOS entrypoints, must be written for DOS version 6, as the sector addresses are changed, compared to earlier DOS versions. All sectors are now addressed from 0 and up consecutively, independant of the track numbers and the disc drive type.

Examples of programs, using direct access to the disc are LIB.BAC, COPYLIB.BAC and most commercial programs, protected against copying.

A user may be prevented from writing with direct sector access on the disc units, by a low privilege in the user parameters (Chapter 3.2).

2.3 Direct I/O to disc or printer interface.

Programs, doing direct I/O to the disc or printer interfaces can not be run in the ABC/DTC-net system. Note that a local printer(also with ABC80) on a separate interface card of course can be driven by direct DataBoard I/O commands.

2.4 Compatibility ABC800/DTC and ABC80

BASIC programs, written for ABC800/DTC must be converted before use on ABC80 and vice versa. The program should be stored on disc in list form (.BAS) and loaded to the target computer for modifications. While loading a program, stored in list form, the computer checks the syntax and outputs error messages for the non-compatible statement lines. These statements can then be changed to convert the program between ABC800/DTC and ABC80 format.

Different versions of the BASIC non-listable utility programs are used for ABC800/DTC and ABC80.

machine code programs (.ABS) may generally be run in both ABC800/DTC and ABC80.

2.5 New 5 1/4" Mini-floppy disc structure

The DOS version 6.xx uses a different library size than earlier versions and, for double track, also a different disc sector for the bit- and lockout maps.

The Mini-floppy structure is as below:

| Drive type/DOS | Library size | Bitmap | Lockout map |
|--------------------|--------------|----------|-------------|
| ----- | | | |
| Single Track Drive | | | |
| Old DOS | 8 sectors | Sect: 6 | Sect: 7 |
| New DOS (vers. 6) | 16 sectors | Sect: 6 | Sect: 7 |
| | | | |
| Double Track Drive | 16 sectors | Sect: 14 | Sect: 15 |

Using single track diskettes, created with the old DOS (earlier than version 6), only 120 files may be created within one diskette to avoid overwriting the data.

If a central double track mini-floppy drive is used, single track diskettes may be read from or copied from, but not written to. If a double track controller EPROM vers 6.10 or later is used, the diskette is automatically write-protected if the switch on the interface is set to single track.

Note that different mini-floppy controller EPROMs are used for single and double track drives. The A6.xx controller EPROM is for double track, while the A5.xx controller EPROM is for single track.

2.6 New card select code for the 8" standard floppy

The standard card select code for the 4108 8" floppy interface is 56 octal for the DOS vers 6.xx. See section 10.5.3 how to select the code.

3. USER DIRECTORIES, ACCESS PRIVILEGIES

3.1 User directories

The disc space may be divided into several directories, in several levels. A user file directory is treated by the DOS as an extra device, UFD:, with a separate file library. File accesses are not possible directly between different user file directories. To access files within a directory, a user must 'enter' this directory.

In a ABC/DTC-net system, a user automatically enters a directory at log-in to the system, but only a user with high privileges, a 'super-user', has access to all directories. Each operator can from any terminal computer log-in to different directories, using different user names.

The device name of the current user file directory is always UFD:, independant of the directory name.

The normal disc library is called the master file directory (MFD) and contains all files, not belonging to a user file directory. The master file directory also contains the user directories as directory referencies (.Ufd). Files in MFD is accessible from all directories.

For each directory, at least 18 sectors are needed on the disc for the library. If the cluster size on the disc is larger, one cluster is the minimum size.

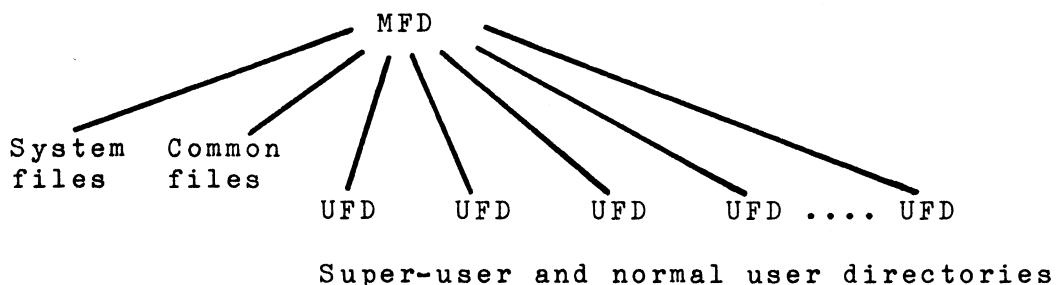
The UFD.ABS, UFD.BAC programs are used to create, rename, enter or exit a user file directory. Note that only a supervising user ('super-user') has access to the UFD program in the ABC/DTC-net system.

The UFD-programs must reside in the master file directory on a disc/diskette.

See appendix 1 for a detailed description of the user file directory structure and the handling of the UFD program.

Common programs and data-base files reside in the master file directory, accessible for all users. These files in the master file directory are accessible also from a user file directory. The common program files may be write protected for safety.

The directory structure in the ABC/DTC-net system is normally only in two levels:



3.2 Login, User, Super-User privileges

In the ABC/DTC-net system, a user on a connected computer system has to be predefined, and enter through a log-in procedure. Without the log-in procedure, programs and data files in the master file directory can be accessed for reading or loaded for execution, but the central unit is write-protected and direct sector accesses are not possible. Due to this, the LIB or COPYLIB programs can not be executed.

To log-in to the system, the LOGIN.BAC program is run. A user name and a password shall be given for access. If a directory is defined for a user, this directory is automatically entered at log-in.

To define new user parameters, the MAKEUSER.BAC program is run. The MAKEUSER can also delete or rename a user or define a password to be used at log-in. The user may be connected to a user file directory by MAKEUSER, but the UFD-program must be used to create or delete a physical directory on the disc.

Note that a user, within a directory has access only to the files in this directory and in the master file directory.

Several users may be connected to the same directory.

Operators at several connected computers may log-in with the same user name at the same time. At the time of log-in the terminal number is connected to the given user parameters (directory and privilege).

A user privilege may be defined by one byte with a value between 1 and 255. A super-visor 'super-user' should have the privilege 255 to enable also future options.

| Bit | Function with the bit value 1 |
|-----|--|
| 0 | Enable log-in |
| 1 | Super-user privilege. Enable executing UFD. |
| 2 | Enable writing on disc also with direct sector access. |
| 3-7 | Future options |

Examples of privileges:

- 1 : Normal user with full access to his own directory and the MFD. Writing with direct sector access can not be done.
- 5 : Normal user, which also can write on disc with direct access.
- 255: Super-user, which also can execute the UFD program to create new users.

Only a super-user can execute the UFD program. Sensitive programs like MAKEUSER, DOSGEN, DISKCHK, RAMOPT.BAC should also be accessible only from a 'super-user'. These programs (not UFD or RAMOPT.SYS) should reside in a super-user directory.

With the UFD program, a super-user has full access to the entire central disc system, including other user directories.

3.3 Updating common files

Files in the master file directory are accessible from all users. Several users may also log in to the same user directory to have simultaneous access to files.

In these cases no system protection exists for accessible files, unless they are write-protected. Care should be taken, not to update the same file from more than one user at a time. Note that 'update' here means writing records to the disc/diskette.

Changing a file is a two step process. Read a record and make the change in the file-buffer, then write the record back to the disc. While working with a record in the buffer, it is possible for another user to update the record on the disc, causing errors or missing data when the first user writes his record to the disc.

Use different user directories and different files if possible, otherwise the user program must control the updating procedure carefully.

4. CENTRAL EXECUTION OF SYSTEM UTILITIES

Data transfer on the line is minimized by partly executing some system programs within the central unit. For this purpose, the central unit includes 16 Kbytes of RAM.

Some programs, like COPYLIB, can also be executed in the normal way, locally in the connected computers, but at a slower speed if large amounts of data shall be transferred. The central unit automatically executes some system programs locally if the central memory is occupied by another user.

Some programs, like RAMOPT are always executed in the central unit, and will not be started if the central memory is occupied.

Examples of programs, executed partly in the central unit:

DOSGEN.ABS
COPYLIB.ABS
DISKCHK.ABS
RAMOPT.SYS

If a user turns off or resets his computer, while his system program is executing in the central unit, the central RAM memory is released after 3 minutes.

5. COMMUNICATION, ABC-NET CABLE

All units are interconnected via one 3-wire cable, the ABC-Net cable, which is connected to the central processor. The central processor controls the communication by polling the terminals, i.e. sending out requests on the line to one terminal at a time, until an answer is received.

Each terminal has a unique terminal number (0-31), set by the user on a dip-switch on the terminal card.

For printer protocol see chapter 8.3.

The data transfer is done in blocks of 256 bytes, which is the size of one disc sector. Physically, a serial, asynchronous protocol with V24 signal levels are used, but with special driver circuits and radio filters:

19200 Baud
8 data-bits
Odd parity
One stop bit

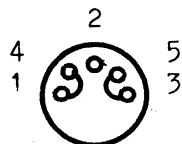
The output drivers, on each connected terminal card, drives current from +12V at logic "1", but releases the line to a high impedance at logic "0". Due to this design, the line is free to use by other users, also without power on a connected computer. The terminal cards are connected in a multi-drop configuration to the ABC-Net cable.

The physical ABC-Net cable is divided into separate cables between each connected unit, each of which has two parallel sockets for the cable.(Chapter 10.1).

The system is, due to this design, very easy to expand by connecting new units to the nearest computer in the chain.

The connectors on the cable should be normal audio-connector plugs in DIN standard, type SP5 with 5 pins.

The recommended cable is a multicore, 3-wire, shielded cable with at least 0.22 sq.mm area.



Connector socket
seen from outside

1,4 Data IN to terminals
OUT from central unit
3,5 Data OUT from terminals

6. 7028 CENTRAL UNIT, CONNECTION BOX, RAM BOARD

The 7028 central processor board is a DataBoard 1062 single board computer, with extra line drivers, clock circuit and ABC/DTC-net system program in EPROM.

A short cable (1.5 m) with a connection box is included, to be connected to the central processor via a 9-pin connector. The box provides two standard DIN sockets for the ABC-Net cable and one DB25S socket for the central printer.

Connector on the central processor:

| | | | |
|-------------------------|---|-----------|----------------------|
| | 1 | Output | to ABC-Net pin 1,4 |
| | 2 | Input | from ABC-Net pin 3,5 |
| To DB25S pin 20 (CTS) 6 | 3 | GND | to ABC-Net pin 2 |
| To DB25S pin 7 (GND) 7 | 9 | PR Output | to DB25S pin 3 |
| | 5 | PR Input | from DB25S pin 2 |

Connectors on the connection box:

| Printer | | ABC-Net |
|---------|------------------|----------|
| | | 2 |
| | | 4 5 |
| | | 1 3 |
| 2 | In data | |
| 3 | Out data | |
| 7 | GND | |
| 20 | CTS (Busy signal | 2 |
| 6 | High=enable) | 4 5 |
| 5 | | 1 3 |
| 4 | | |

A 16 Kbytes memory card is required in the central unit. The DataBoard 2009 16K RAM is recommended.

The two cards shall be inserted in the DataBoard bus in one of the central disc systems.

The on-board SIO is used for communication, channel A for the ABC/DTC-net communication and channel B for the standard printer.

Only one version of the central software is used. To modify the system parameters, the RAMOPT.SYS program is executed, after power-up or reset. (Chapter 9.4).

7. 7029 and 7030 TERMINAL UNITS

The terminal unit contains interface circuits for the ABC/DTC-net system and an operating system in EPROM, replacing the normal disc operating system and printer routines in the memory area of ABC800, Facit DTC or ABC80.

The terminal card is connected to the respective computer and no extra power supply is needed.

ABC800/Facit DTC requires the 7029 terminal card.

In ABC800/DTC, the normal printer routine may still be used to drive a local printer (device PR:), in which case the central printer will have the device name RPR:. The central printer can be used with the standard device name PR:, if the internal printer EPROM, marked no.7, in ABC800/DTC is removed. Note that also the graphics is removed together with the printer routines.

The terminal card is connected directly to the bus connector in ABC800/DTC (or to a bus expansion box).

ABC80 requires the 7030 terminal card.

The 7030 terminal card is delivered in a metal box with a 500 mm ribbon cable, for connecting to the ABC80 bus connector. No local printer can be used and the normal printer device name PR: is used for the central printer.

Terminal number and card select number

Each terminal shall have a unique terminal number (0-31) set on the dipswitch in position 1E on the card. The pins 1,2,3,4 and 5 are used to set the binary number. An open jumper indicates a binary "1" in the corresponding bit position.

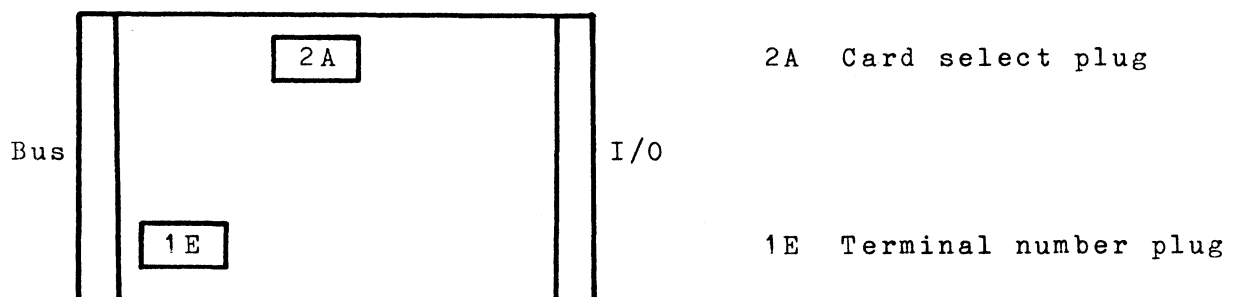
```

      o o o o o
      I  I  I  Example 2 + 8 = 10 decimal
      o o o o o
    Pin 1
    Value: 1 2 4 8 16
  
```

The terminal number can be read with an INP STAT command on the connected computer, after selecting the card address 48 (=60 octal). The card select code is prewired on the card position 2A at delivery, with open jumpers at pin 5 and 6.

```

10 PRINT "Display terminal number"
20 OUT 1,48
30 PRINT (INP(1) AND 31)
  
```



8. PRINTER

The central printer is common to all users. Printer output is queued up on disc files (spooling) and printed in the order 'first-in' -- 'first-out'. The files are normal text files.

Full 8-bit bytes may be sent to the printer. NOTE, however, that control characters below 07 must not be sent, not to interfere with the file control characters on the disc, which could cause loss of text.

8.1 Printer access, Device names PR: and RPR:

Each user accesses the central printer in the normal way.

```
OPEN "device name" AS FILE nn
```

```
output text
```

```
CLOSE nn
```

where: "device name" is "PR:" or "RPR:".
nn is the file number in the user program.

NOTE! Always CLOSE the printer device, as the printout on the central printer only starts after closing the printer device.

The terminal software simulates the printer driver and sends the printed text to a file in the central unit.

The ABC80 printer device is always "PR:". No local printer can be connected.

The ABC800/DTC printer device name can be "PR:" for the local printer and "RPR:" for the central printer. If the internal printer EPROM, marked no.7, is removed from the ABC800/DTC, also the device name "PR:" is directed to the central printer. Note, however that the printer EPROM also includes the high resolution graphics commands, which in this case is removed with the EPROM.

No printer options, like baudrate etc, may be given in the device name. If a different baudrate than the standard 2400 Baud shall be used, it must be initiated by the RAMOPT.SYS program. Other options, like paging, are not available.

8.2 Spooling

Output to the central printer is buffered on the central disc units. Several users may in this way use the printer at the same time without delays.

One print file is created for all text printed by each user, between the OPEN.. and CLOSE.. statements.

Information about the user of a print-file is not available, and each user is recommended to print a user identification as the first line of output.

The printout of a file always starts with a formfeed (new page), unless the last printed character was a formfeed.

The printing order is given by the time each user closes the printer device. When the print-file is closed it is added to the queue of files, waiting to be printed.

Print-file names have the form PRINTnnn.QPR (or .ZPR) where 'nnn' is the physical file number on the disc. A print-file has the extension '.ZPR' as long as it is open. When closed, the extension is changed to '.QPR' at the same time as it is added to the print-queue.

At power-on or reset of the central units, after executing the RAMOPT.SYS program, the central discs are searched for print-files. All files, whose extension begins with '.QP' are considered as print-files and are used to build a new print-queue. Print-files, which were not properly closed and still have the extension '.ZPR', must be renamed by the user with the '.QPR' extension to be printed out.

The print files are created on the first available disc in the default search order.(HDx:, MFx:, MOx:, SFx:)

8.3 Printer interface

8.3.1 Default V24(RS232C) interface

As standard, V24 (RS232C) output is used to the printer with:

2400 Baud
8 data bits
No parity
One stop bit

Back-signaling (printer-busy) can be either by the CTS-signal or with XOFF/XON characters, sent back from the printer.

CTS: Pin 20 in the DB25S connector is also wired to pin 6. Printing is enabled, when a high level on pin 20 is detected from the printer.

XOFF/XON: Printing is inhibited at the reception of the XOFF (=13 HEX) character, until XON (=11 HEX) is received from the printer.

Changing baudrate are done by the RAMOPT.SYS program, which may change the setting of the central processor board.(Section 9.4)

The printer is connected via the connection box to the central processor card. The I/O pins on the DB25S socket on the box are:

- Pin 2 In data (XOFF/XON only)
- 3 Out data to printer
- 7 Ground
- 20 DTR/CTS Back signal from printer. High level enables printing.

- 6 wired to pin 20
- 4 wired to pin 5
- 5 wired to pin 4

8.3.2 Optional printer interfaces

In the standard software, the following options are available:

- 4001 Centronics interface
- 4015 SP1 interface

The central system program automatically initiates the optional printer, if a printer interface with the card address 74 octal is available at reset or power-up. If no interface is found on-line, the standard V24 printer output is selected.

A separate DataBoard interface card is used, with the card address 74 octal (=60 decimal). See the 4001 or 4015 interface datasheets for details about these interfaces.

NOTE! that the I/O-slot for the optional printer interface in the central unit, shall be wired for interrupt. This is a wire from the I/O-slot pin 5A to the processor slot pin 13B.

Card address 74 octal is set on a plug on the interface board:

| | | | | | | | |
|-------|---|---|---|---|----|----|-------------------------|
| | 0 | 0 | 0 | 0 | 0 | 0 | |
| | I | I | | | | | 32+16+8+4=60dec=74octal |
| | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pin | 1 | | | | | | |
| Value | 1 | 2 | 4 | 8 | 16 | 32 | |

8.4 Print-output format.

The output to the printer is directed to a standard text file, which is read by the system and transferred to the central printer.

- 1 - Line-Feed characters can not be printed to the print-file, as they are ignored by the PRINT statement. Note, however, that the routine to transfer the print-files automatically inserts a Line-Feed (10 dec.) after each Carriage Return (13 dec.). Thus use CHR\$(13) instead of CHR\$(10) to print Line-Feeds. Or use successive ;#F : ;#F : ;#F etc. Record I/O may be used to output CHR\$(10) as line-feed characters directly.
- 2 - Do not print control characters below 07. Especially the characters 03 and 00 should not be used. Printers needing NULL characters as line fill can not be used.
- 3 - Also 8-bit data may be printed.
- 4 - Data may be output to the print-files also with record I/O statements (PUT in ABC800). This could be recommendable when generating graphics.

9. ABC/DTC-NET UTILITY SOFTWARE

Special ABC/DTC-net versions of the following programs are used:

| | |
|-------------|-------------|
| COPYLIB.ABS | COPYLIB.BAC |
| DOSGEN.ABS | DOSGEN.BAC |
| DISKCHK.ABS | DISKCHK.BAC |
| UFD.ABS | UFD.BAC |

| | |
|------------|--------------|
| | MAKEUSER.BAC |
| LOGIN.ABS | LOGIN.BAC |
| RAMOPT.SYS | RAMOPT.BAC |
| | SETSTART.BAC |
| | STARTUP.BAC |

STARTCMD.SYS

The BASIC (.BAC) versions are short programs to load and start the machine code programs, and in some cases, to transfer user defined parameters to the system programs.

Different versions of the .BAC programs are used for ABC800/DTC and for ABC80.

9.1 COPYLIB, DOSGEN, DISKCHEK, UFD

These programs are normally partly executed in the central processor unit.(Chapter 4). The procedure to use the programs are the same as the standard procedure, described in appendix 1.

UFD

The UFD program must reside in the master file directory, but can only be executed by a 'super-user', i.e. a user with a 'super-user' privilege.(Chapter 3.2).

DOSGEN

The DOSGEN, as well as the RAMOPT.SYS program, can only be executed in the central unit. All other users are temporarily locked out during execution. However, DOSGEN will pause each 5 seconds and let the system execute one request from another user. All users will continue their tasks, as soon as DOSGEN releases the system.

COPYLIB, DISKCHEK

The COPYLIB and DISKCHEK programs are normally executed in the central unit, but is automatically executed in the local computer if the central memory is occupied by another user when the program starts. If large amounts of data shall be transfered, local execution will be slow.

9.2 MAKEUSER

The MAKEUSER program can:

- List already defined users (Not passwords)
- Create new users
- Delete users
- Rename users

MAKEUSER can connect a user to a directory, but the UFD program must be used to create or delete directories.

The user parameters, associated with each user, are:

User name: Max 8 characters. Given at login.

Password: Max 8 characters. Given at login.
May be Return only if not used.

Directory: Optional. Should be a existing directory,
into which the user will enter automatically
at login.
If excluded, the user will stay in the
master file directory at login.

Privilege: Examples: (See chapter 3.2 for details).
1 : Normal user.
5 : Normal user, which also may write to
a disc with direct sector access.
255 : Super-user with all options enabled.

The MAKEUSER program should be accessible only to a super-user, by having the program within a super-user directory.

Run the MAKEUSER program by:

```
RUN MAKEUSER
```

The display may be as in the following example:

```
** MAKE/DELETE USERS **  
Vers. 6.00 1982-08-10  
Copyright 1982 Dataindustriier AB  
  
Name      Dir      Privilege  
SU        USERDIR  255  
KJ        DIRA      1  
.....    .....    ...  
  
New, Delete, Rename (N,D,R,none) ...
```

None:

No answer (only RETURN): Exit from MAKEUSER.

New:

New user is created by the following questions. If a new user is created, with the same name as an old user, the old user is deleted and overwritten with the new user parameters.

LOGIN: <Max 8 characters user name.
Return only -> No creation>

PASSWORD: <Max 8 characters password.
Only stars are echoed.
Return-only is acceptable>

DIRECTORY: <Name of a user directory,
without extension.
Return only -> Only MFD is
accessible.>

PRIVILEGE <Select 1 - 255,
Return only --> privilege 1>

NEW USER....DONE <Message. 'DONE' is output
after creation of a new user>

Delete:

Deletion of a user is done with:

DELETE USER NAME: <Give login user name,
Return only -> No delete>

WARNING! Do not remove the last 'super-user'. At least one user must be able to enter the ABC/DTC-net system. For creation of new users, the MAKEUSER must be available and MAKEUSER is normally in a super-user directory.

Rename:

Renaming a user requires:

RENAME USER NAME: <Give login user name,
Return only -> No rename>

NEW NAME: <Give new login name,
Return only -> No rename>

9.3 LOGIN

To enter the ABC/DTC-net system, the LOGIN.BAC program must be executed on the connected computer system. Before login, the central system is write-protected and no direct access on the central discs can be made.(E.g. the LIB.BAC and the COPYLIB.BAC programs can not be executed.)

Normally, a user will automatically enter into a user directory after the login procedure.

Several users may simultaneously login with the same user name and/or with different names connected to the same directory. (See chapter 3.3)

Note that the term 'USER' refers to a user name, and has no connection with the user terminal. At login, however, the central processor connects the user name to the terminal number.

The SETSTART program may be used to automatically login to a specified user at power-on or reset of the terminal computer system. (Chapter 9.5).

Run the LOGIN program by:

```
RUN LOGIN
```

The system responds with:

```
LOGIN:          <Give user name>
PASSWORD:      <Give password. Only stars will
                be echoed. Return only is a
                valid password if defined for
                the user>
```

9.4 RAMOPT.SYS

The RAMOPT program is used to modify the default parameters in the central unit, e.g. printer baudrate etc.

Parameters for the RAMOPT.SYS program are stored on disc by the RAMOPT.BAC program, which also will load and start the RAMOPT.SYS machine code program in the central unit.

The RAMOPT.SYS is automatically executed at power-on or reset of the central unit, if the RAMOPT.SYS file is available. The parameters, earlier defined by RAMOPT.BAC on the disc, are used. Note that a Winchester disc is not available directly at power-on, as it is not ready until after 15 seconds. If the RAMOPT.SYS program on a Winchester shall be used, reset the central system again after this time. Alternatively run the RAMOPT.BAC program.

The RAMOPT.SYS program is not to be confused with the selfstart option in BASICINI.SYS, which is executed in the local computers at local power-on or reset.

The RAMOPT.BAC programs should be in a 'super-user' directory, not accessible to normal users. The RAMOPT.SYS file must be in the master file directory, as it shall be executed at power-up or reset.

Run the RAMOPT.BAC program, starting also RAMOPT.SYS, by:

```
RUN RAMOPT
```

The display will be:

```
** SETUP UTILITY **  
Vers. 6.00 1982-08-12  
Copyright 1982 Dataindustrier AB
```

```
Any changes (Y/N) ? ..
```

If the answer is not YES, the RAMOPT.SYS program is executed in the central unit.

If the answer is YES, questions about options are asked like in the following example. After answering all questions, the parameters are stored on disc and the RAMOPT.SYS program is loaded and executed in the central unit.

Printer baudrate:

```
SELECT BAUDRATE (xxxx) ? ...
```

The (xxxx) will be the earlier defined baudrate, taken from the disc. Ex. (2400). Answer return only to keep the earlier defined baudrate.

If an incorrect baudrate is given, the following is displayed:

```
ILLEGAL BAUDRATE, USE ONLY: 75,110,300,600,  
1200,2400,4800,9600,19200 Baud.
```

9.5 SETSTART FOR ABC800/DTC

An auto-start feature is available for ABC800/DTC, which selectively can start different programs at reset or power-on on the different terminal computers, defined by the terminal numbers.

In addition, an automatic log-in sequence, giving the user name and password, may be defined for the terminal.

A 'super-user' may access the SETSTART program, to change parameters for all terminals, while each normal user may run SETSTART to set and change his own parameters only.

SETSTART is run to disable or enable auto-start and to define the auto-start program to be executed. SETSTART can also define the auto-login sequence. The parameters defined are stored in the file STARTCMD.SYS, which is created, if not existing. The STARTCMD.SYS is stored on the first available disc, searching in the default order, MFx:, SFx:, HDx:.

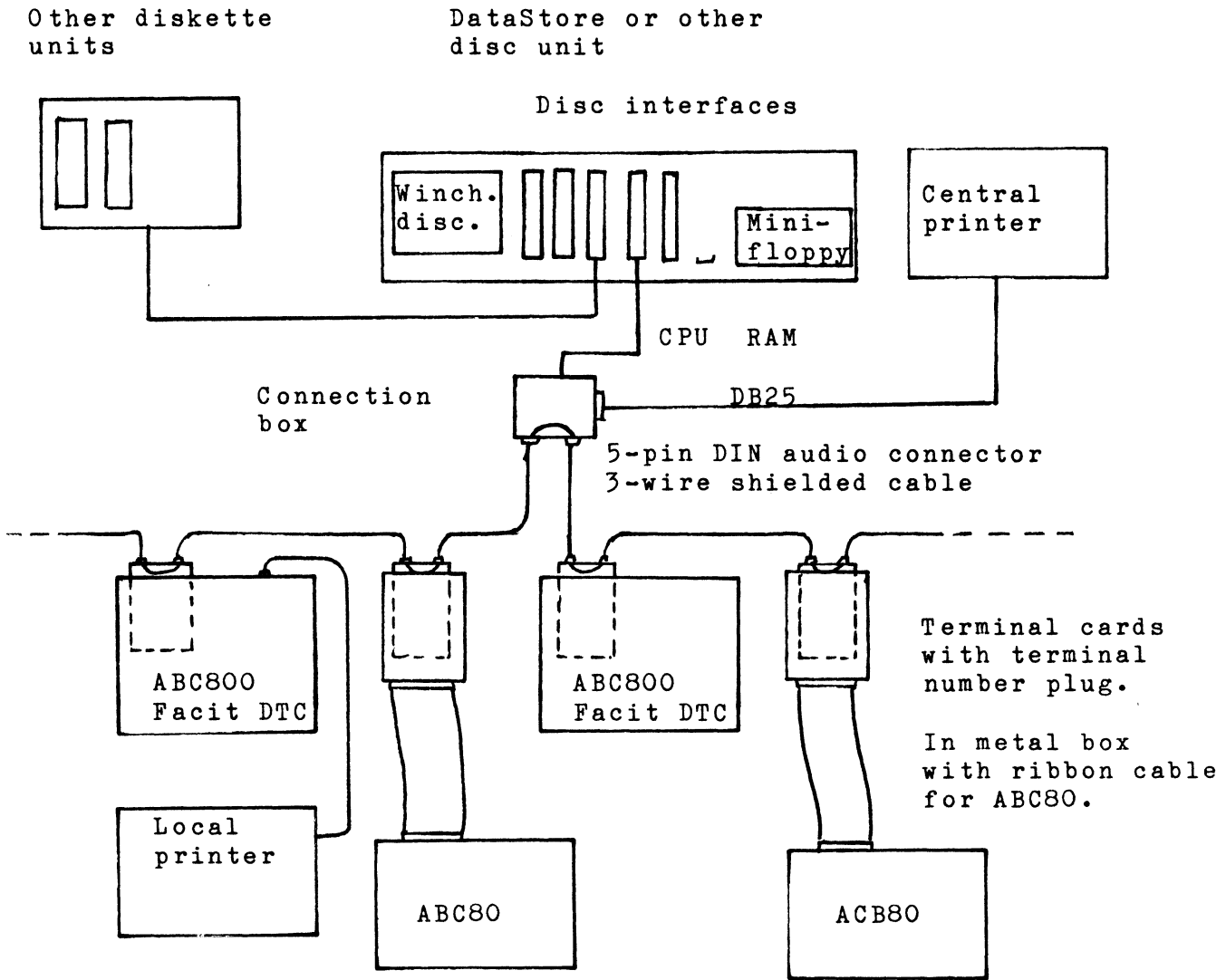
The following files are used:

- SETSTART.BAC
- STARTUP.BAC
- STARTCMD.SYS
- BASICINI.SYS

At power-on or reset of a local system, the BASICINI.SYS program chains to the STARTUP.BAC program, which decodes the terminal number and selects parameters for auto-start from the file STARTCMD.SYS.

10. INSTALLATION

10.1 Physical connections



The system components are listed in chapter 1.

10.2 Installing the central system with printer.

10.2.1 The central unit

The 7028 central processor card and the RAM card shall be inserted in the DataBoard bus in one of the central disc units. To this bus, also the interfaces for all other disc units are connected, as well as the optional printer interface, if used.

The cable from the connection box is connected to the 7028 processor card.

The 7028 card shall be in the CPU-slot, marked with a coloured dot. The RAM card shall be in a memory slot to the right of the CPU-slot and the interfaces to the left.

The DataStore 5/320 unit is used as example above, but any DataDisc or DataStore unit with a DataBoard bus may be used.

The free I/O slot may be used for an optional printer interface or for extra disc interfaces.

NOTE! The interrupt must be wired from the I/O slots (pin 5A) to the CPU slot (pin 13B).

10.2.2 The ABC-Net cable

The chain of terminal computers are connected via the ABC-Net cables to the connection box.

10.2.3 The central printer

If a standard V24 (RS232C) printer is used, the central printer is connected to the connection box. The cable from the printer shall have a DB25P plug for the socket in the connection box. Note that the Busy-signal from the printer shall be on pin 20 or pin 6 on the connector and that a low signal level indicates busy to disable printing. Alternatively XOFF/XON signals are used.

When an optional printer is used, the interface is connected to an I/O slot in the DataBoard bus, which shall be wired for interrupt. See the respective datasheets for the different interfaces. The card select jumpers shall be set to 74 octal (=60 decimal), i.e. with a closed jumper only on pin 1 and 2.

SP1: 4015 interface and cable
Centronics: 4001 interface and cable

10.2.4 Optional extra disc units.

When an external disc unit is used, the interface are moved to an I/O slot in the same DataBoard bus as the ABC/DTC-net processor.

10.3 Installing 7029 to ABC800/Facit DTC.

The 7029 terminal board is inserted directly in the I/O slot in ABC800/Facit DTC.

First select a unique terminal number (0-31) with the jumpers on the terminal board position 1E.(Chapter 7).

If no local printer shall be connected and the low resolution graphics are not used, the internal printer EPROM within the ACB800/DTC may be removed to direct the printer device 'PR:' to the central printer. Otherwise the device name 'RPR:' is used for the central printer.

The terminal card is connected with ABC-Net cables to the nearest point in the chain (Chapter 5).

10.4 Installing the 7030 to ABC80.

The 7030 terminal card is delivered in a metal box with a 500 mm ribbon cable, which is connected to the bus connector on ABC80.

Installation is as for ACB800, with two exceptions:

- A. The metal box must be opened to set the terminal number.
- B. No local printer can be used. The PR: device is the central printer. A local printer EPROM is not used.

10.5 Disc interfaces

10.5.1 4107 Winchester interface and Winchester disc format

The DataBoard 4107 Winchester interface is used and provides efficient disc handling, using an on-board Z80A processor and DMA.

The DMA enables simultaneous data transfer between the Winchester disc and the 4107 and between the 4107 and the ABC800/DTC.

The 4107 includes 6 sector buffers in RAM. Optionally more, if the 2K RAM chip in the 28 pin socket is replaced by a larger RAM chip(MOSTEK ByteWyde). No software change is needed when upgrading the RAM size. With 8K RAM, 30 sector buffers are available.

The buffers provide quick access with the following method:

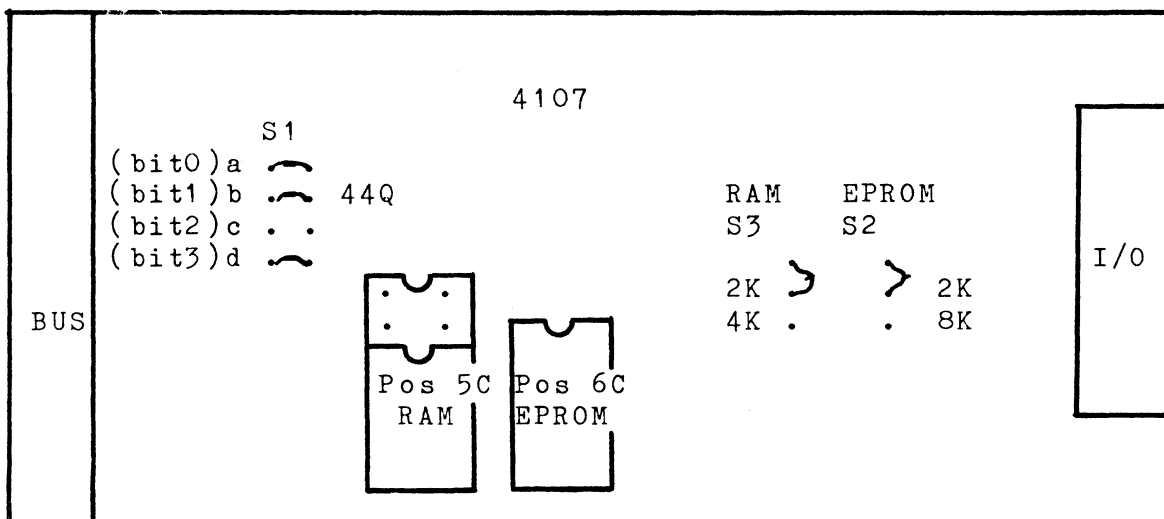
- a) Two consecutive sectors are always read into the buffers at each physical disc access.
- b) Often used sectors are kept in the buffers.

By this means the data transfer of large files, stored in contiguous sectors are done with less than 10 ms/ sector.

The format used as standard on the winchester disc has 256 bytes sector and a cluster size of 32 sectors. The allocation of space on the disc in the bit-map is done in multiples of one cluster. The bit-map is in one sector (8x239 = 1912 clusters/disc x32 = 61184 sectors) and is in sector no. 14.

A logical disc device contains a maximum of 65535 sectors (about 16 M bytes), limited by the 16-bit format of the ABC800/DTC pointer. For larger winchester units, each physical unit will be divided into two or more logical devices, using an optional controller EPROM on the 4107 interface.

The 4107 interface shall as standard have the channel select code 36 dec=44 octal, but with the switches S1, card select codes 40Q to 57Q may be selected.



10.5.2. 4106 Mini-floppy interface

The 4106 DataBoard Minifloppy interface is used, which is standard for ABC800/DTC 5 1/4" mini-floppy. The 4106 includes its own Z80A microprocessor and is delivered with the A6 controller EPROM for Double Track minifloppy drives or with the A5 controller EPROM for Single Track minifloppy drives.

Double Track controller EPROM vers.6 (A6).
.....

A6.xx Used with Double Track 5 1/4" drives only.
 Double Track (Single Track for reading only)
 Double Side/Single Side, Switch selected
 Double Density only!

The A6-controller EPROM provides a read-ahead buffer with 3 sectors on the 4106 board to minimize the average access time.

Using a double track drive and the A6 EPROM, DOS may simulate a single track drive structure, while READING only. See section 5.2 for details.

The A6 controller EPROM, version 6.10 or later, is automatically 'write-protecting' the disc when single track is selected on the interface switch.

Single Track controller EPROM Vers.5 (A5).
.....

A5.xx Single Track only.
 Single Side/Double Side, Switch selected.
 Single Density/Double Density, Switch selected.

The A5 controller EPROM are only used with single track diskettes. If the used mini-floppy is a single track version, the A5 EPROM should be used in DataStore. The A5 EPROM provides a buffer with one sector only.

Can also read and write on diskettes, DOSGEN:ed with the old DOSGEN (versions lower than 6.00), but be careful as the library size is changed in DOS version 6.00 and later. Not more than 120 files may be created on an old diskette. See section 5.2.

Jumpers and switches:

- S1 Open Card Select 55 Q (Single Track standard)
- Closed Card Select 54 Q (Double Track standard)





- S2,S3 Close only one!

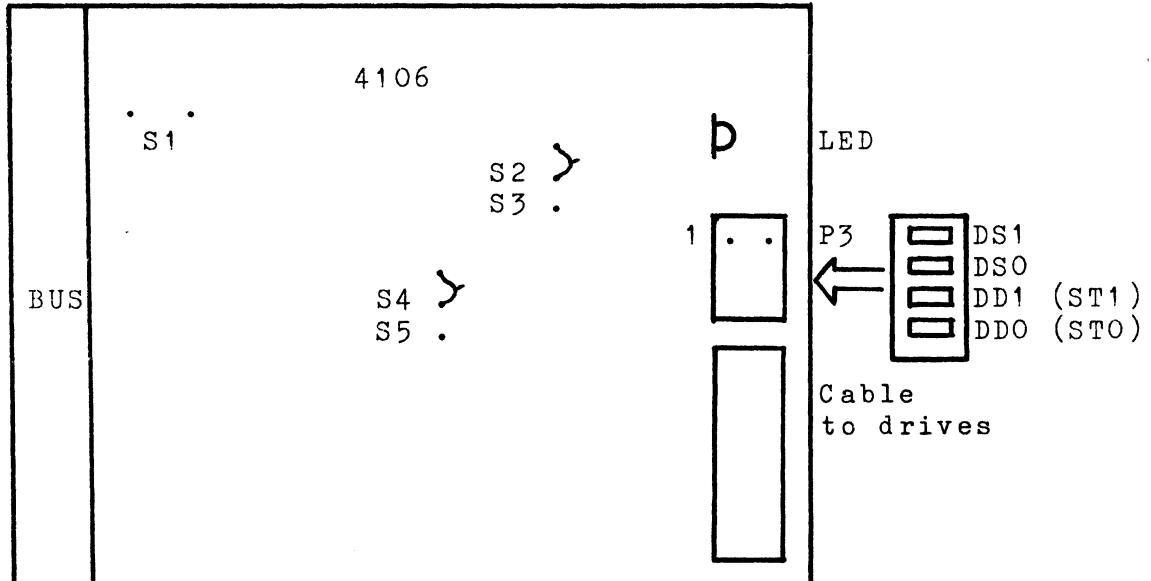
- S2 Closed 500 ns precompensation (Standard)
- S3 Closed 250 ns precompensation

- S4,S5 Close only one!

- S4 Closed Precomp. program controlled (Standard)
- S5 Closed No precompensation

On the P3 connector (the 10 pin connector at the edge of the 4106) four switches can be connected. These are read by the controller EPROM and effects the storage format.

| | | P3 connector | | Closed switch gives: | |
|---------|----|---|-----|----------------------|--------------|
| | | pin | pin | A5 EPROM | A6 EPROM |
| Drive 0 | 9 |  | 1 | Double Density | Single Track |
| | |  | 5 | Double Side | Double Side |
| Drive 1 | 10 |  | 2 | Double Density | Single Track |
| | |  | 3 | Double Side | Double Side |



10.5.3 4108 Standard 8" Floppy interface

The 4108 DataBoard 8" standard disc interface includes its own Z80A microprocessor and is for ABC800/DTC delivered with the A8 controller EPROM.

The disc operating system only supports double density storage on the 8" floppy diskettes, but commands are available on the A8 controller EPROM to handle also single density. This can be done with special programs, e.g. to use standard IBM 3740 storage format.

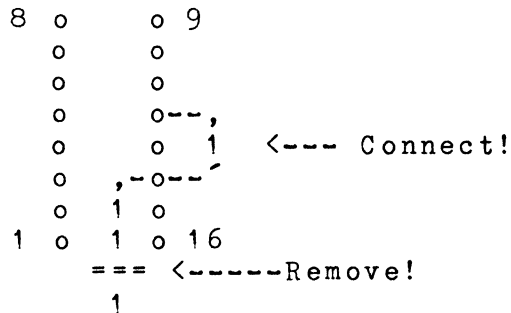
A 3 sectors read ahead buffer is provided on the interface to minimize the average access time.

Jumpers and switches:

S1 Open Card select 55 Q
 Closed Card select 54 Q

NOTE! To achieve the card select 56 Q, which is standard for the new DOS vers 6.xx, the switch S1 shall be closed and the card shall be modified by the following:

- Remove the connection from circuit 1C, pin 14 to circuit 1B, pin 9.
- Insert a wire from circuit 1C, pin 14 to circuit 1C, pin 12.



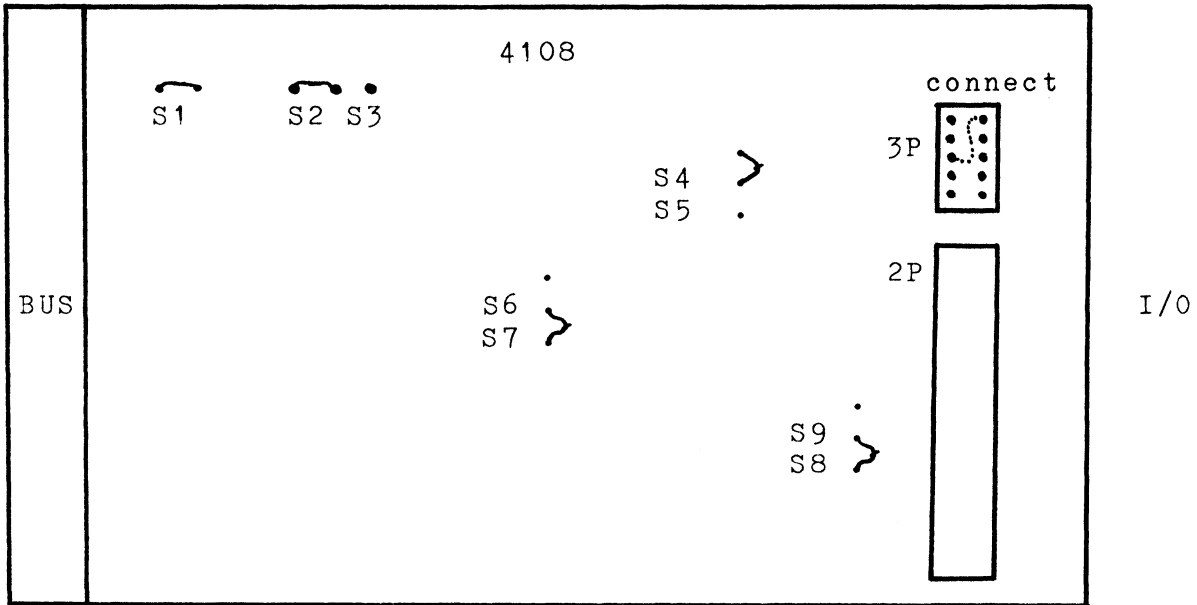
S2,S3 Close only one! S2 closed as default!
S2 Closed Use onboard EPROM 2716 (Default)
S3 Closed Use onboard EPROM 2732

S4,S5 Close only one! S4 closed as default!
S4 Closed 250 nsec precompensation
S5 Closed 125 nsec precompensation

S6,S7 Close only one! S7 closed as default!
S6 Closed Precompensation from track 43
S7 Closed Program controlled precompensation (Default)
NOTE! No precompensation is used by DOS.

S8,S9 Close only one! S8 closed as default!
S8 Closed L0 current to device on pin 2 (default)
S9 Closed L0 current to device on pin 16

On the 3P connector (the 10 pin connector),
pin 3P:9 and pin 3P:6 shall be connected.



11. START-UP PROCEDURE

After installation of the system, all units are powered on.

The local terminals may be powered on or off at any time on-line.

If the RAMOPT.SYS shall initiate the central system, a diskette with RAMOPT.SYS shall be inserted before power-on of the central unit. If RAMOPT.SYS is on the Winchester disc, a reset of the central system must be done 15 seconds after power-on, as the Winchester disc is not ready until after 15 seconds.

Central system reset sequence.

At reset or power-on on the central unit, the ABC/DTC-net processor does the following:

- 1- Default initiation.
- 2- Check if an optional printer interface is connected, otherwise initiate the V24(RS232C) printer port.
- 3- Search the RAMOPT.SYS program on the connected discs/diskettes. If found, it is executed to initiate the system, using the parameters earlier stored on disc by the RAMOPT.BAC program.
- 4- Check for old print files, with the extension beginning with '.QP'. Build a print queue and start printing. (Note that only closed printfiles are printed).
- 5- Start to scan the terminals for communication.

Terminal computer reset sequence.

At reset or power-on of a terminal computer, the following is done:

- 1- Local initiation
- 2- Search for the BASICINI.SYS program on the connected discs/diskettes. The BASICINI.SYS starts the STARTUP.BAC program, which may do an automatic log-in and/or autostart of a user program, if this sequence is enabled for the terminal number of the computer.
- 3- If no autostart is enabled, a normal signon is achieved on the terminal computer, waiting for an operator command.

Enter the ABC/DTC-net system.

To enter the system, the LOGIN.BAC program must be executed, unless it is automatically done.

.RUN LOGIN

The LOGIN.BAC asks for the user name and password. A normal user only accesses his own directory and the master file directory.

A super-user accesses the entire central disc system, using the UFD program. When shipped, the login is 'SU' and no password is used.

NOTE! that some system programs for ABC80 has different names. See appendix 2.

Create new users.

Run UFD.BAC or UFD.ABS from a super-user, to create new directories on the system. A user may also be created without a directory reference, accessing only the master file directory.

RUN UFD or BYE
 UFD,C NEWDIR

Run MAKEUSER to define new user parameters or list the available users.

RUN MAKEUSER

Running programs.

Run programs exactly as in a single user environment. Note the available device names in chapter 2.1.

Example:

RUN HDO:MYPROG

Note that both ACB80 and ABC800/Facit DTC can be used, in which case different versions of the BASIC utility programs are used. The .ABS programs can usually be executed in both ABC800/DTC and ABC80.

Using printer.

NOTE! Always CLOSE the printer device to start the printing!! Each print-file is printed on a new page.

With ACB800/DTC, use PR: for the local printer and RPR: for the central printer.

NOTE! that separate line-feed characters can not be printed as CHR\$(10). Use instead CHR\$(13), which is carriage return. A line-feed is automatically inserted after each carriage return.

12. TECHNICAL DATA

| | |
|------------------------|---|
| 7028 | Central processor card with connection box on a 1500 mm cable. System software in EPROM. System utility diskette. |
| ABC-Net cable | Constructed by the user, using standard 5-pin DIN audio connectors and 3-wire shielded cable. |
| Max total cable length | 300 m |
| 7029 | Terminal card for ABC800/Facit DTC. System software in EPROM. |
| 7030 | Terminal card for ABC80 in a metal box and with 500 mm ribbon cable. System software in EPROM. |
| Max. no. of terminals | 32 |
| Communication | Serial, asynchronous, 19200 Baud. All units connected to the same line. |
| Central printer | Standard: V24(RS232C) 2400 Baud. No parity, One stop bit, 8 data bits. Baudrate changable via RAMOPT.SYS. Backsignaling, using either the CTS-signal or XOFF/XON characters. Optional: SP1 or Centronics in a separate interface. |
| Central discs | Up to 12 disc devices. 5"/8" Winchester, 8" Floppies and 5 1/4" Mini-floppies. A DataBoard bus is required in one of the central units. |
| Number of open files | 6 files/user may be simultaneously open. |
| Protection | Each user may have a user directory with files, protected from other users. Common files may be write-protected. File pointers are local in each terminal computer, which enables several users to access common files. |
| Local printer | Only to ACB800/Facit DTC, a local printer may be connected, which is independant of the central system. The device RPR: is the central printer and PR: is the local printer. |



APPENDIX 1

ABC/DCT DOS vers. 6.xx

Appendix 1 contains a description how to use the system programs with DOS version 6.xx for ABC800/Facit DTC.

NOTE! THAT THIS APPENDIX IS AN EXTRACT FROM A DESCRIPTION OF THE GENERAL DOS 6.xx FOR ABC800/DTC.

THE INFORMATION IN THE ABC/DTC-NET MAIN MANUAL OVERRIDES ANY INFORMATION GIVEN IN THE APPENDIX 1.

The following DOS system programs are not used in the ABC/DTC-Net system. Any reference to these from sections, describing other programs are not valid.

SYS.BAC
DEVDES.REL
PRESTART.BAC
ADDOPT.ABS
SYSTEM.ABS
ERRCOPY.ABC

Special versions of the system programs are needed to run on the ABC/DTC-Net system. The standard ABC800/DTC system programs can normally not be used.



HANDLING DOS 6.xx ABC800/FACIT DTC SYSTEM PROGRAMS

System programs are generally machine code (.ABS) programs, started from DOS. A short start-up program in BASIC is delivered with each program, making it possible to start the system programs with a normal RUN command in BASIC mode.

When starting a system program from BASIC, the program asks for the parameters, otherwise given in the DOS command line.

1. SYSDIR.SYS

System file, stored on disc by DOSGEN, when initiating a new disc. It contains pointers to the library and bit-map sectors and the short volume name, which may be defined at DOSGEN. SYSDIR.SYS is write protected. The disc operating system is, however, accessing the disc direct without using the SYSDIR file.

2. SYS.BAC, DEVDES.REL

The SYS.BAC is not available in ABC/DTC-Net systems.

3 UFD.BAC or UFD.ABS (Optional utility.)

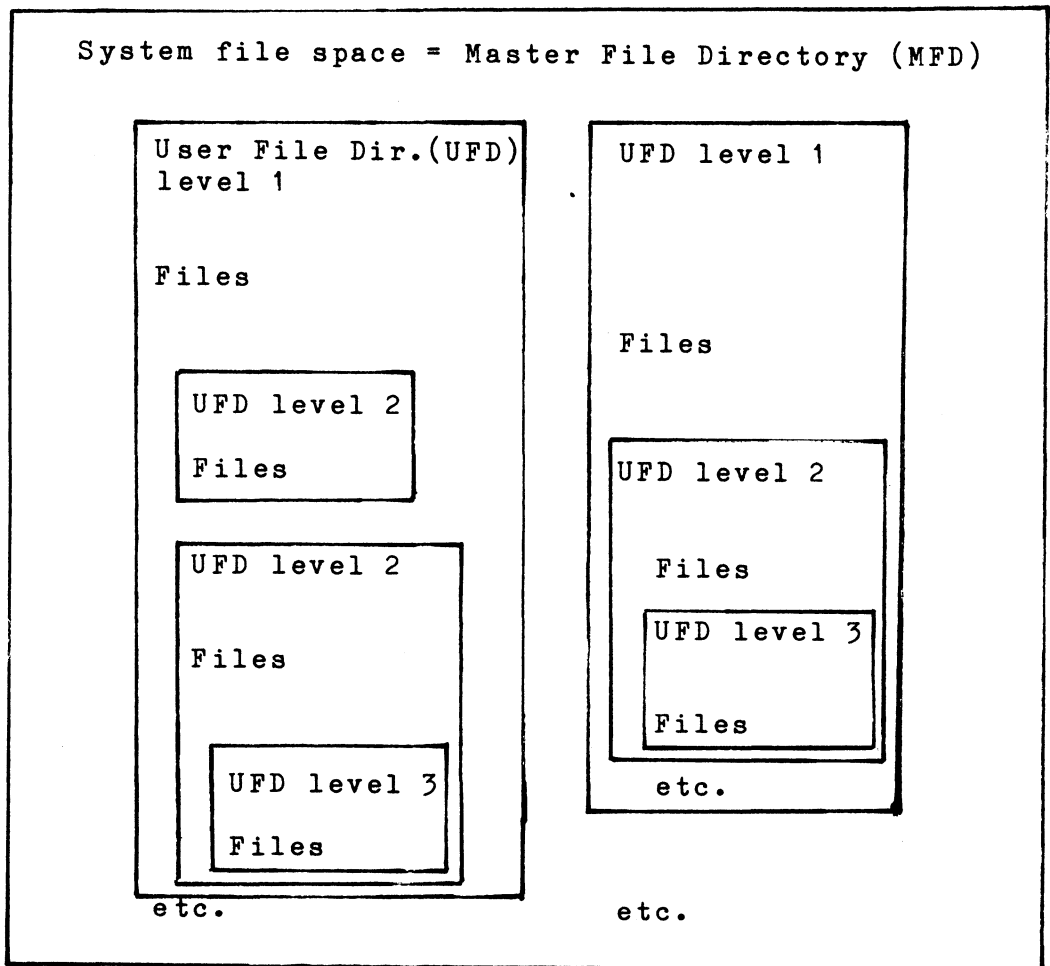
3.1 UFD - User File Directory Description.

The optional UFD program is used to subdivide a disc device into subdirectories in several levels. All types of disc or diskette devices can be subdivided into directories, using the UFD program.

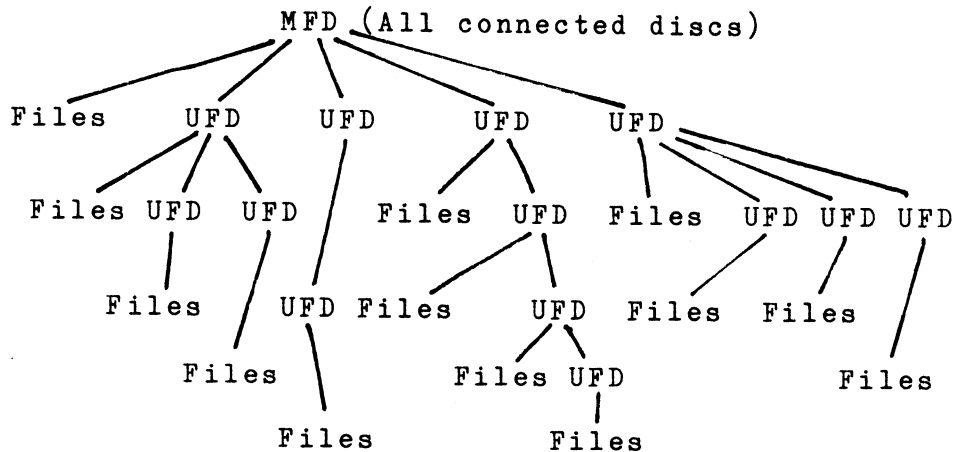
A directory can be described as a file, sub-divided into several files, with a separate library. The minimum allocated space for a directory is 18 sectors (or the cluster size, if it is larger). Each directory can have other subdirectories etc. etc.

A User File Directory is treated as an extra device with a separate file library. File accesses are not permitted directly between different User File Directories. The device name of the current directory is always UFD:, independant of the directory name.

The UFD program is used to Create, Delete or Rename User File Subdirectories at different levels or to enter into or exit from a UFD (User File Directory)



To access a file in a user file directory, the user must first enter into the corresponding directory, using the UFD program. The user enters the tree - like structure from above, step - by - step. The 'MFD' and the first level 'UFD's can be entered directly from any UFD-level, if the UFD program is available in the master file directory.



Files can be created, modified and deleted under the current UFD without any conflict with files in other UFD's or MFD on any device.

Files in the master file directory (MFD) can be directly addressed from all directories.

Files in a UFD may have the same name as files in other UFD or MFD.

If a file access is done without specifying the device name the system searches for the file on all accessible devices. the search order is:

- 1 - Current UFD
- 2 - Other devices in the order: HD(0 - 3), MF(0 - 2), MO(0-1), SF(0 - 2).

If only the current UFD shall be searched, the device name UFD: must be given.

Files are copied in both directions between the master file directory and the current user file directory with the COPYLIB or COPY program. A real copy is done of the file.

Listing the library with the LIB program, while within a UFD, only lists the files in the current UFD, if the directory UFD: is given.

The LIB listing only lists the filenames and the name of all subdirectories at a lower level, which have been created within the current UFD.

3.2 Running UFD

The program UFD is started by:

RUN UFD or by: BYE or by: BYE
 UFD UFD,Opt Name

Display:

**** User File Utility ****
Ver 6.00 1982-05-18
Copyright 1982 Dataindustri AB

L - List current directory
M - Assign master file directory
F - Assign father directory
R - Rename current directory
C - Create a new directory
D - Delete current directory
none Assign to an existing directory

Give option (L,M,F,R,C,D,none):
Filename? <Directory name
 may include device spec.>

| Option: | Function: |
|---------|---|
| L | Display current directory name and the names of the father directories up to the 'MFD' |
| M | Return to MFD (Master File Directory). |
| F | Return to the Father directory, i.e. to the next higher level. |
| R | Rename the current directory. The program asks for the new name. Extension must not be specified. UFD will set it to ".Ufd". |
| C | Create a new directory under the current directory and enter this new directory. The program asks for the new directory name. A new directory requires at least 18 consecutive sectors on a disc for the directory library. If the cluster size is larger, the minimum size will be the cluster size |
| D | Delete the current User File Directory and return to the father directory. This requires that no files are left in the current directory. Delete the files before deleting the UFD. The files can be copied to the master file directory if they shall be saved. |
| none | Enter into an existing user file directory if only RETURN is given as option. The program asks for the name of the directory. |

4. LIB.BAC or LIB.ABS

Display the file library of a disc unit.

All file names or
selected file names on
all connected disc units or on
a selected disc unit or on
the current user file directory

may be displayed or listed on the printer.

The space left on the disc is displayed in number of sectors.

Start by:

RUN LIB or by: BYE or by: BYE
LIB LIB,Opt Dir:File

Display:

```
** Library list **  
Ver 6.00 1982-05-18  
Copyright 1982 Dataindustri AB  
Directory to list? <Give Device: or Device:Filename>  
S - Size  
N - Filenumber  
F - File status  
P - Printer output  
none - Filenames only  
Options (S,N,F,P,none) ?
```

Device: (In `Directory to list`)

- Device or directory name.
ex. HDO: or MFO: or UFD:.
To display files, only from the given directory.
The current UFD is always called UFD:.
- RETURN only.
To display files from all accessible directories
in the default search order.(UFD:,other devices).

Filename: (In `directory to list`)

- The beginning of the filenames to list. All files
which begin with the characters given are listed.
- The beginning of the extensions of the files to list.
The dot `.` must be given before the characters.
All files with an extension, beginning with the
given characters are listed.
- Both the beginning of the name and the extension
may be given.

Ex: Filename(s): MY.BA
Displays all files, of the form MY?????.BA?

Options: Functions:

Answer a combination of the options. Ex: SP.

- S List also file sizes. The size is given in sectors.
- N List also the physical file number in octal notation.
The physical file number is a direct file pointer in
the disc library.
- F List also the file status, as one letter in front of
the filenames.
The status can be: S Write protected.
 D Delete protected.
- P Direct the listing to the system printer. If a
non-default printer option shall be used, it
should be initiated before running LIB.
- none Default option, achieved by RETURN only, is to
list filenames only on the display.

Under DOS, the LIB options and parameters may be given in the
command line.

After displaying 20 lines on the screen, the listing halts and
continues one line each time the operator presses any key.

To stop the listing, press RETURN or CTRL-C.

Listing of the library of a single track diskette, using a
double track drive, may be done as the program checks the
bit-map and library and temporarily uses single track commands
if a double track structure is not found. Note that the switch
on the interface must be set to single track.

The listing produced by LIB is structured as in the following example:

** Library list 6.00 82-05-18 **

Drive HDO: UFD:MYDIR .Ufd
MYFILE .TXT MYFILE .BAK DOTS .BAC
Remaining space 60007 sectors of 61184

Drive HDO:
SYSDIR .SYS LIB .BAC LIB .ABS
SYS .BAC UFD .BAC UFD .ABS
DOSGEN .ABS CMDINT .ABS DISKCHK.ABS
ERRCOPY .ABS DELETE .ABS BASICINI.SYS
PRESTART.BAC COPYLIB .ABS COPY .ABS
REPROT .BAC SYSTEM .ABS ASMZ .ABS
OBJUPD .ABS ESTAB .ABS DEBUG .ABS
EDIT .ABS PROM .ABS PASCAL .ABC
PASCAMP .COD FORT80 .ABS MYDIR .Ufd
YOURDIR .Ufd

Remaining space 60007 sectors of 61184

Drive MFO:
SYSDIR .SYS LIB .BAC LIB .ABS
SYS .BAC DOSGEN .ABS UFD .BAC
UFD .ABS CMDINT .SYS COPYLIB .ABS
HISDIR .Ufd HERDIR .Ufd

Remaining space 573 sectors of 1220

5. BASICINI.SYS

The file BASICINI.SYS contains BASIC error text lines and can be provided with a selfstart routine, which automatically is executed at power-up or reset. The first sector of the BASICINI file contains the selfstart option as well as pointers for the text strings in the following sectors. This sector is loaded into DOS-buffer 0 (0F500H-0F5FFH or from 62720 dec) if available at reset. The sector is kept in the ABC800/DTC memory during normal program execution.

5.1 BASIC Error Text strings.

The system checks if the BASICINI.SYS file is available at power up or reset. If not, all Basic errors are displayed as error numbers only.

5.2 Selfstart option.

The first sector of BASICINI.SYS contains:

- 1 - If a jump instruction is stored in the first three bytes (=0C3 Hex), the ABC800/DTC executes the jump and the machine code routine that can follow in the sector.
- 2 - Note that the first part of the sector also contains pointers for the error text. The pointers follows directly after the three byte area, reserved for the jump instruction.
- 3 - If no jump instruction is found, ABC800/DTC tries to decode and execute the first characters in the second part of the sector as a BASIC command line in list format. The command line must be terminated by a carriage return (0D Hex). The program PRESTART.BAC may be used to store a command line in BASICINI.SYS.
- 4 - If none of the above is found, a normal start-up of the BASIC interpreter is done.

5.3 Option system loading.

For the ABC/DTC-Net system, see the RAMOPT.SYS program.

6. PRESTART.BAC, ADDOPT.ABS

The PRESTART or ADDOPT is not used in ABC/DTC-Net systems. See instead the SETSTART and RAMOPT.SYS programs in ABC/DTC-Net.

7. CMDINT.SYS

This is the command interpreter program, decoding direct commands running under DOS (The disc operating system). Machine code (.ABS) programs are loaded and executed, using CMDINT.SYS.

CMDINT.SYS is loaded and executed from BASIC with the command:

```
BYE
```

The disc operating system displays:

```
** Disc operating system Ver. 6.06 **  
Ver 6.00 1982-05-18  
Copyright 1982 Dataindustri AB
```

The first version number is the DOS version, the second is the version of the CMDINT.SYS program.

This requires that the CMDINT.SYS file is available. Otherwise the system stays in BASIC mode.

Re-entry to BASIC from DOS is done with the command.

```
$BAS
```

After entering DOS the name of any .ABS file is given to load and start the .ABS program. Switches and/or parameters can be given in the command line. Switches are one or more alphanumeric characters separated from the program file name with only a comma. Parameters are file names or other text strings separated from the program name and/or the switches by one or more spaces.

The .ABS program is responsible for decoding the switches and/or parameters which are available in the DOS command buffer (from OCOBOH and up.). However after loading the .ABS program, DOS automatically tries to interpret the parameters as file names and create a logical file table of 16 bytes for each parameter, starting at address OFD40H and up.

The logical file tables are configured as:

- 1 byte Drive number 0-31 or OFF Hex (unspecified)
- 1 byte Always OFF Hex
- 8 bytes File name
- 3 bytes Extension, if given (otherwise space)
- 3 bytes Device name, if given (otherwise space)

The CMDINT. SYS is loaded at the address 0C000H-0C6FFH. Useful addresses are:

- 0C100H Entry. Display prompt.
- 0C103H Reentry without prompt.
- 0C106H Entry to a routine, loading and starting an .ABS file given in the command line. RETURN (=0DH) must follow the command line.
- 0C109H Entry to a routine, displaying text. Register HL in the Z80 processor shall point to the text string. The last character in the text string shall be "RETURN" (=0DH) or "EOT" (=03H).
- 0C000H Entry to a routine for reading a string of text from the keyboard. Register HL shall point to the buffer, where to store the string. Register C shall be the maximum number of characters to read. Reading is done until a RETURN is typed or until the maximum number of characters are read. Each character is echoed on the screen.

The DOS revision number, taken from the address 606FH, is displayed when starting CMDINT. The DOS type is indicated in the address 6070H:

- 0 ABC800
- 1 ABC80
- 2 RAM-OS
- 3 ABC/DTC-NET Central (Multiuser)
- 4 ABC800 - NET Terminal -"-
- 5 ABC80 - NET Terminal -"-

8. SYSTEM.ABS

SYSTEM.ABS is not available in ABC/DTC-Net systems.

10. DISKCHEK.ABS

The DISKCHEK.ABS program checks the entire disc and repairs repairable errors. All errors are reported.

It checks the lock-out map, the bit map, the library sectors and the record index blocks for each file on the disc. All sectors belonging to any file is checked, but free disc space is not checked.

Errors are displayed, if found, and the operator may select to repair the sectors or not. Some hard errors can not be repaired within the file. Use the ERRCOPY program to copy the file and remove sectors with hard errors.

Repairable errors are:

1. Lock-out map errors. Repaired.
2. Bit-map errors. Repaired.
3. Files, not properly closed. Closed.
4. Bad UFD header sectors. Repaired.
5. Sectors with CRC hard errors from the disc controller are repaired by writing back the data, which could be read from the sector, but with the correct check-sum. This may be wrong data, but is the best possible.
6. Record format error in a RIB, Record Index Block. This can not be repaired, but the operator can select to delete the entire file, whose RIB is bad.
7. Bad filename in the library. Can not be repaired, but the operator may delete the file.

Non-Repairable errors are:

1. All hard errors, but a CRC error from the disc controller.
2. Data errors, which can not be detected by the system.
3. Record Format Errors. See below.

Warnings are:

Record Format Errors in a data record. This might not be a real error and is not repaired. It can be the result of unsuccessful write attempts, which have been re-written in another disc position. It may also be un-used sectors in a file, which has not been properly closed. Diskchek closes open files, but records with in the last cluster, after the last allocated sector can still cause 'record format error' messages.

Start the DISKCHK program by:

BYE
DISKCHK

Display:

** DISKCHK **
Ver 6.00 1982-05-19
Copyright 1982 Dataindustrier AB

Device to check:..... <give device!>
W - Display also warnings.
D - Display filenames during check.
N - No repairing. No changes on disc/diskette.
Y - Correct all failures found.
F - Fast check, Warnings will not be checked.
Options (W,D,N,Y,F,none) : <give options!>

The default options when only RETURN is given (none) is:
- Check all filespace on disc.
- Do not display warnings.
- Do not display the filenames.
- Display errors and ask operator to select repair or not.

During testing, the operator can break and exit to DOS by typing CTRL-C. The keyboard is checked each time any display appears.

A temporary pause in the DISKCHK listing of errors and filenames is achieved by keeping any key pressed.

Be patient, testing takes a few minutes.

Under DOS the parameters may be given in the command line.

Example:

DISKCHK,WD HDO:

11. ERRCOPY.ABS

ERRCOPY is not available in ABC/DTC-Net systems.

12. COPYLIB.ABS

COPYLIB is used to copy files from one directory or device to another, using the library for selecting files. Files can be copied between discs and/or diskettes as well as between the current User File Directory (=directory UFD:) and the master file directory (=the device name).

Start by:

```
BYE  
COPYLIB Dir1:Fileselect,Dir2:
```

or use the options COPYLIB,V or give only COPYLIB and the program asks for parameters.

COPYLIB will copy files from 'Dir1:' to 'Dir2:'. Directory names like HDO:, MF1:, UFD: etc. are used.

The files in the library of 'Dir1:' is displayed one after the other. The operator selects for each file if the file shall be copied or not.

If the 'Fileselect' character string is given, COPYLIB ignores files which do not correspond to the select criteria. See the description of the LIB.BAC program for the select criteria.

The display after start-up is a prompt like in the following example, indicating the different possible commands to give for each file:

```
COPYLIB UFD:.BAC,HDO:  
  
** COPY FILES **  
  Ver 6.00 1982-05-17  
  Copyright 1982 Dataindustri AB  
AVAILABLE COMMANDS:  
A   =   COPY ALL REST OF LIBRARY  
X   =   EXIT, DO NO COPYING  
I   =   IGNORE THIS FILE AND REST OF LIBRARY  
Y   =   YES, COPY THIS FILE  
Y=NEWFILE.EXT =   COPY, GIVING FILE A NEW NAME  
  
COPY NYFILE .BAC   ?Y   <List of files,  
COPY YOURFILE.BAC ?Y   corresponding  
COPY TEST    .BAC   ?I   to the select criteria>
```

If only RETURN is given as answer, the file will not be copied. Note that the SYSDIR.SYS file is not listed, as this file must not be copied.

During the copying phase, each filename is displayed and the number of sectors in the file.

When the verify option is specified, the COPYLIB will compare the old and new files after copying, and display error if the files are not equal.

When files are to be copied, using a double track drive, FROM a single track mini-diskette TO a double track mini-diskette, a special feature of the COPYLIB program can be used. The program will automatically use single track commands if the diskette structure is not double track. The device parameters will temporarily be set and reset during the copying phase. The switches for single/double track on the 4106 interface should be set according to the diskette format.

NOTE! DO NOT copy TO a Single Track minifloppy with a double track drive!!

If COPYLIB is started without parameters, the program asks the operator for the parameters according to the following example:

```
Original Drive unit ?  
Drive unit for copy ?  
Verification ?  
File to copy ?           <give Fileselect>  
Available command :  
    <etc. according to display shown above>
```

13. COPY.ABS

Copy one file between devices or within the same device.

Start by:

BYE
COPY Device:Filename.ext,Newdevice:

or

COPY Device:Filename.ext,Newdevice:Newfile.ext

If COPY is started without parameters in the command line, the program asks the operator for the parameters according to the following example:

Original Drive unit ? :
Drive unit of copy ? :
File to copy ? :
New file name ? :

14. DELETE.ABS

DELETE.ABS is used to delete files on a device, using the library for selection. The file selection is done exactly as in the COPYLIB program.

Answer RETURN for files which shall not be copied.

See COPYLIB.ABS for more information.

Start by:

```
BYE                or BYE
DELETE             DELETE Drive: File
```

Display

```
** Deletion of files **
  Ver 6.00 1982-05-19
  Copyright 1982 Dataindustri AB
Drive unit? ....
Delete file? ....
Available commands:
A - Delete all files left
X - Exit, No deletion
I - Ignore this file and rest of library
Y - Delete this file
```

```
Delete MYFILE .BAC ?....
.
.
.
.
```


15. REPROT.ABS

The user may change the software protection status of a file, using the REPROT program.

One of the options 'W', 'D' or 'X' is given.

| Option: | Function: |
|---------|---|
| W | File is write protected. The file is also delete protected. |
| D | File is delete-protected. Writing is however permitted. |
| X | Protection is removed from the file. |

Start by:

BYE
REPROT

Display:

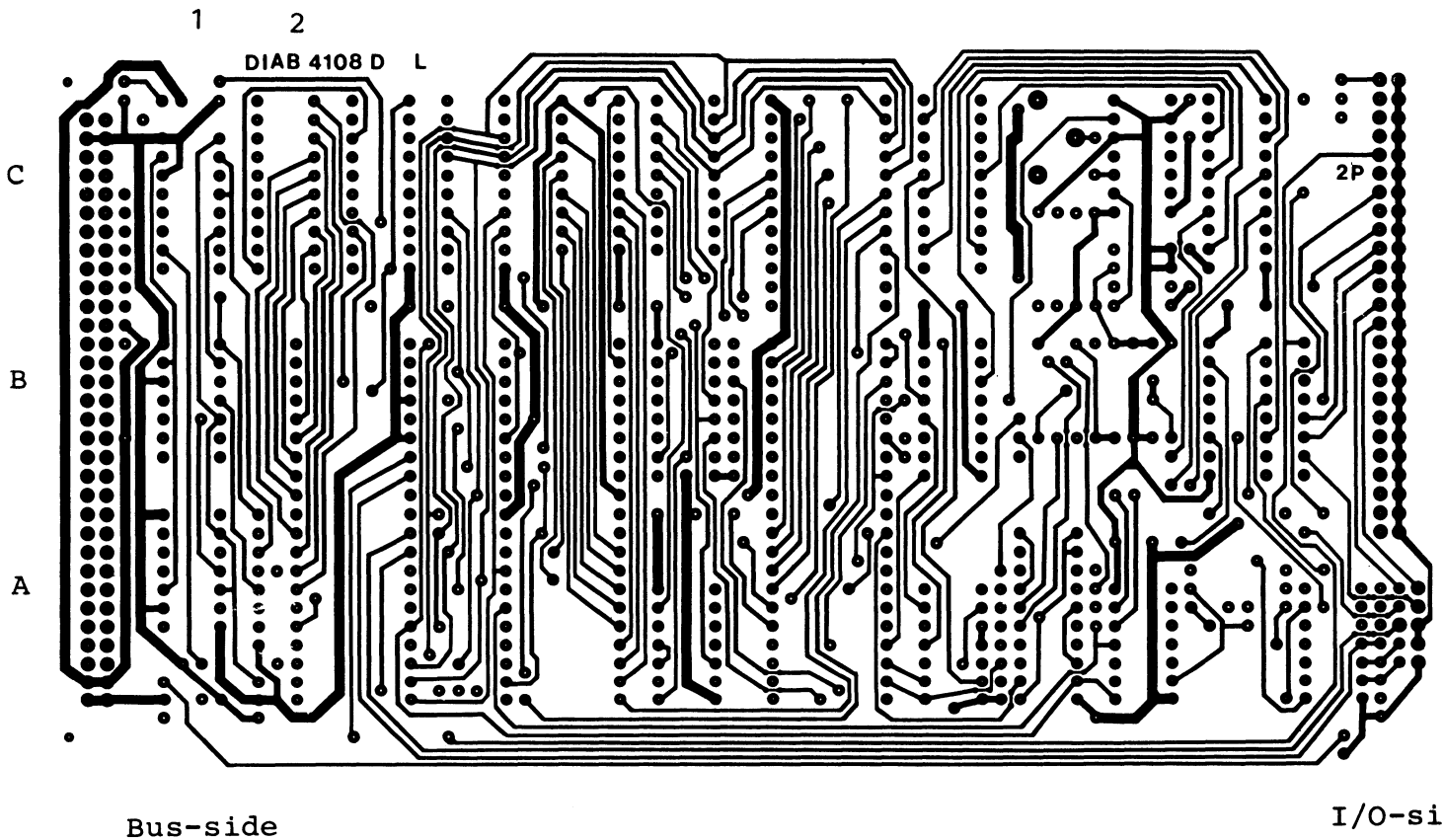
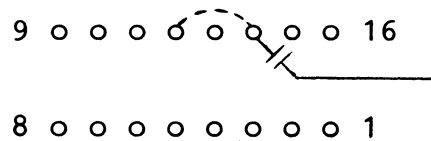
Filename :
Options (X,W,D) : <select one>

Modifiering av kort 4108 för nytt kanalval (56Q)

Bygla pin 12 och 14 på krets pos. 1C.
 Frigör pin 14:s anslutning till krets pos. 1B.

Modification of board 4108, new channel selection (56Q)

Strap pin 12 to 14 on circuit pos. 1C.
 Cut connection from pin 14 to circuit pos. 1B.





ABC802_Net_kabel.

| ABC802 DB9 Hona | Net DIN hane |
|-----------------|--------------|
| 6 <-----> | 3,5 |
| 7 <-----> | 2 |
| 3 <-----> | 1,4 |

ABC802_Strappar.

Strap: 1 On
2 Off
3 On
4 On
5 Off
6 Off
7 Off
8 Off



;

A P P E N D I X 4



1. *Beskrivning:*

Följande komponenter ingår i systemet:

Centralkort, prod.nr. 7028, inkl. kopplingsdosa och systemskiva.

16 K statiskt RAM; prod. nr. 2009/16.

*Terminalkort, prod. nr. 7029 - för ABC 800/DTC eller
prod. nr. 7030 - för ABC 80*

Följande massminnen kan användas:

*5" Floppy: DataDisc 5, -82 och -84
 Luxors samt Facit's floppyenheter*

8" Floppy: DataDisc 88, 888

5" Winchester: DataStore 5, 10

*Skrivare med Centronics, SP1 eller V-24 interface kan
anslutas centralt, samt skrivare med V-24 interface lokalt,
dock ej till ABC 80*

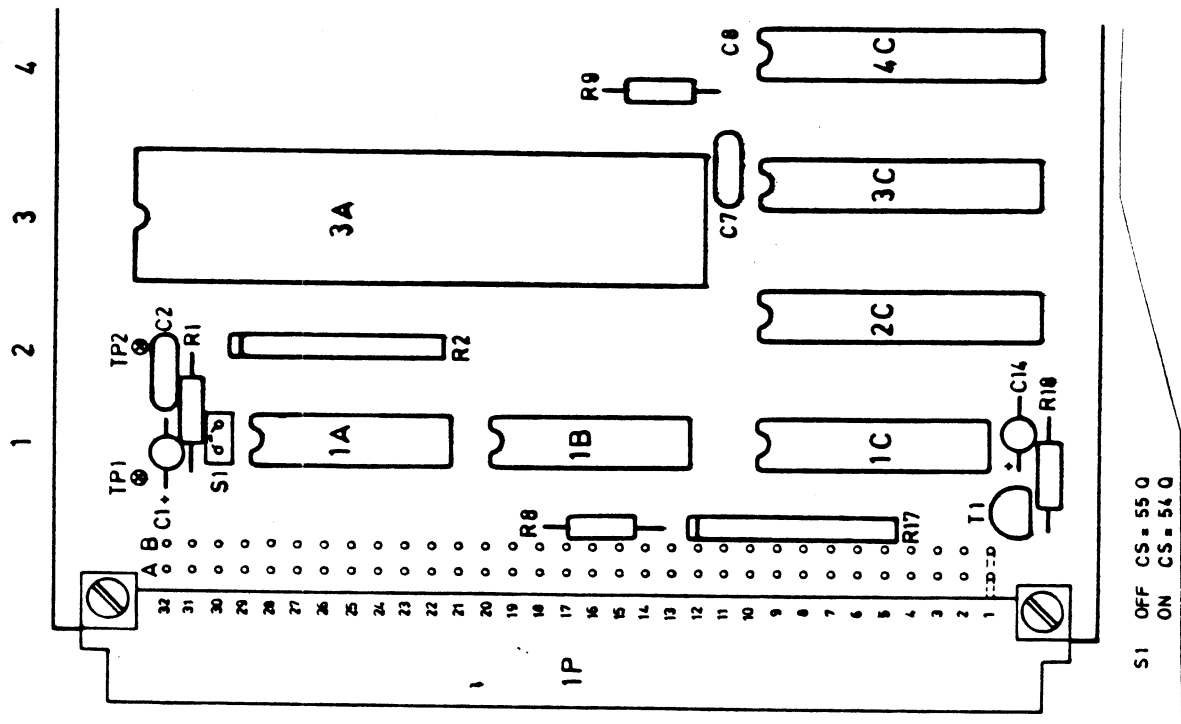
II. *Uppkoppling*

*Centralkortet ansluts till den plats i expansionsdelen där
normalt bussanslutning till dator sker. Kortet är oberoende
av storlek på massminnet.*

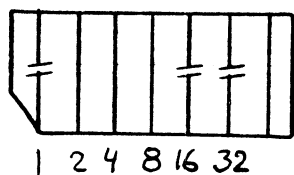
*Ramkort ansluts till någon av kortplatserna till höger om
centralkortet (framifrån sett) Ramkortet skall ges
basadress 48 K.*

Ramkort 2009 levereras färdigbyggd för ABC/DTC-NET.

*Observera att ABC/DTC-NET baseras på Super-DOS 6-121 vilket
ger nya kanalval för 8" floppy samt 5" floppy-double track.
Ändring av kanalval för DataDisc 88 beskrivs i NET- manualen.
För 5" floppy ändras kanalval enligt följande:
Bygling S1 i pos 1a skall byglas.*



Anslutning av terminalkort sker till datorns busskontakt. Kortet skjuts in i ledig kortplats i ABC 800/DTC, medan det ansluts via flatkabel till ABC 80. Varje kort skall ges ett unikt nummer i systemet vilket sker med adressplugg i pos 1c. Bygling ger värde. Exempel:



=2+4+8 = terminal nummer 14

Terminalkortet kommunicerar med centralkortet via en rak (pin 1 till pin 1) treledarkabel.

III. Uppstart

Vid användande av medlevererad systemskiva skall inloggning ske. Kör programmet Login. BAC (ABC 800/DTC) eller Lin 80.
 BAC (ABC 80)
 Login = SU
 Password = <return>

Därefter kan Lib. BAC (ABC 800/DTC) eller Lib 80. BAC (ABC 80) köras.
 Följande skall finnas på skivan:

| | | |
|----------------------|----------------------|----------------------|
| <i>Drive X</i> | | <i>ufd:userdir</i> |
| <i>Dosgen.ABS</i> | <i>Diskcheck.ABS</i> | <i>Diskcheck.BAC</i> |
| <i>Makeuser.BAC</i> | <i>Dosgen.CEN</i> | <i>Diskcheck.CEN</i> |
| <i>Ramopt.BAC</i> | <i>Mkuser80.BAC</i> | <i>*DSKCHK80.BAC</i> |
| <i>*Ramopt80.BAC</i> | <i>Names.SYS</i> | |

| | | |
|---------------------|---------------------|---------------------|
| <i>Drive X</i> | | |
| <i>Sysdir.SYS</i> | <i>Lib.BAC</i> | <i>Copylib.ABC</i> |
| <i>Copy.ABS</i> | <i>Delete.ABS</i> | <i>Basicini.SYS</i> |
| <i>ufd.ABS</i> | <i>ufd.BAC</i> | <i>Lib.ABS</i> |
| <i>Cmdint.SYS</i> | <i>Login.ABS</i> | <i>Copylib.CEN</i> |
| <i>Startup.BAC</i> | <i>Startup1.BAC</i> | <i>Login.BAC</i> |
| <i>Prestart.BAC</i> | <i>Reprot.BAC</i> | <i>Reprot.ABS</i> |
| <i>Ramopt.SYS</i> | <i>Setstart.BAC</i> | <i>Startcmd.SYS</i> |
| <i>*Lin80.BAC</i> | <i>*Lib80.BAC</i> | <i>*ufd80.BAC</i> |
| <i>userdir.UFD</i> | | |

Program markerade med asterisk är ABC 80 versioner.

För att få utskrift av Lib. ABS på central skrivare skall programmet köras enligt följande:

- LIB, RPR: (endast ABC 800).

KOPIERING AV SYSTEMSKIVA A B C / D T C - N E T

Förutsättningar: ABC/DTC-NET innehåller ABC USERDIR.Ufd

USERDIR.Ufd innehåller systemprogram och kan endast användas av SUPERUSER.

SUPERUSER: Login: SU
Password: <

RETURN markeras i texten med <

ABC/DTC-NET i MO0: och ny skiva i MO1:

PROCEDUR:

1. Tryck på RESET och LOGGA IN
2. BYE <
DOSGEN,F MO1: < * FORMATTERA NYA SKIVAN *
J < J < D <
<
3. UFD < * SKAPA USERDIR PÅ NYA SKIVAN *
C <
MO1:USERDIR <
4. ufd < * GÅ TILLBAKA TILL USERDIR PÅ MO0: *
<
MO0:USERDIR <
5. COPYLIB UFD: ,MO1: < * KOPIERA USERDIR FRÅN MO0:
A < TILL MASTERFILE MO1: *
6. UFD < * GÅ ÖVER TILL USERDIR PÅ MO1: *
<
MO1:USERDIR <
7. < * KOPIERA MASTERFILE MO1: TILL
COPYLIB MO1: ,UFD: < USERDIR *
A <
8. UFD < * GÅ ÖVER TILL MASTERFILE MO1: *
M <
9. < * RADERA MASTERFILE MO1: *
DELETE <
MO1: <
<
A <
10. COPYLIB MO0: ,MO1: < * KOPIERA ÖVER MASTERFILE
A < FRÅN MO0: TILL MO1: *
BAS <