

MTC200 Data Backup 18VRS Application Manual

SYSTEM200

	MTC200
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Record of Revisions

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 Bgm.-Dr.-Nebel-Str. 2 • D-97816 Lohr a. Main
 Telephone +49(0)9352/40-0 • Tx 689421 • Fax +49(0)9352/40-4885
<http://www.rexroth.com/indramat>
 Dept. ESM6 (JA)

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1 Introduction

1.1 Chapter Overview

This chapter informs you about the data structure, the backup mechanisms and the data organization of the control family MT-CNC / MTC200 / ISP200.

1.2 Purpose of this Documentation

This documentation describes the execution of a data backup at the work stations of a system unit MT-CNC / MTC200 / ISP200. Both individual systems and networked systems are considered. The data backup (complete backup) is described with the help of three currently available programs used by Rexroth Indramat.

1.3 Determine Hardware and Software Configuration

Due to the variety of possible hardware components in use (MO drive, network card), this instruction can only consider one configuration. Nevertheless the data backup can also be executed with other suitable programs and mass storages. However one configuration tested by Rexroth Indramat is described in this documentation. This description refers to the following components.

Hardware

Operation and Visualization Terminal	BTV20, BTV30
Network card	SMC 9000, typical for BTV20/30
External mass storage	MO drive Fujitsu M 2513 Parallel

Software

Operating system	MS-DOS
Data backup software	Ghost Pro 5.0a from Symantec HDCOPY 2.0 Pro from HDTRONIC DrivelImage Pro 3.0 from PowerQuest

1.4 Purpose of Data Backup

EDV systems are not static systems. Data is created, modified, moved or deleted permanently. Components are added or removed, updates are executed, settings are modified. Furthermore user data and system data exist. There are many reasons for executing a data backup:

- Save data in case of a hardware failure
- Restore the system environment after incorrect operation
- Save main system settings
- Archive a system state before executing an update
- Provide an identical system environment

The system MT-CNC/MTC200/ISP200 provides multiple backup possibilities with different data capacity.

1.5 Data Structure

The system data of MT-CNC/MTC200/ISP200 can be divided into three groups.

Operating system	The data of the operating system WindowsNT. These are system files, network files, service pack files, files with settings e. g. registry, etc.
Rexroth Indramat-user interface	The files of the Rexroth Indramat user interface include the user interface, language files and configuration files with settings.
User data	User data include both the preparation data on the hard disk and the data which is loaded in the control or the drives.

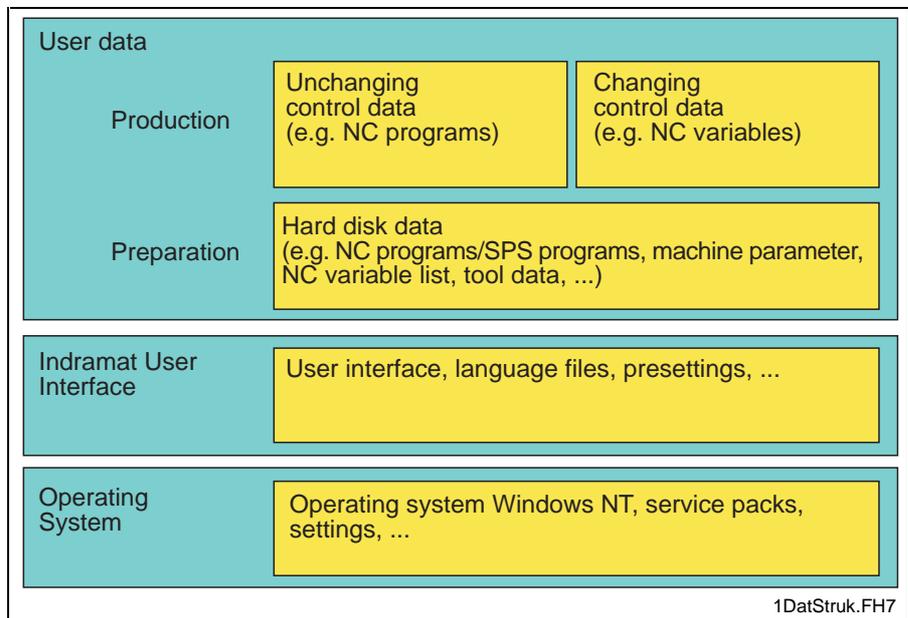


Fig. 1-1: Data Structure

1.6 Backup Mechanisms

For the backup and/or the restore of the different data areas, various backup mechanisms are available.

Operating system	After a system crash the operating system can be installed again with the WindowsNT-CD. Afterwards WindowsNT must be configured again. The
-------------------------	--

	configuration settings can only be restored if they have been completely saved before.
Rexroth Indramat-user interface	The Rexroth Indramat user interface can be installed again with the installation CD or the diskettes after a system crash. The settings can only be restored if they have been saved completely before.
User data	User data is saved on an external data storage medium (server, MO, diskettes) by the Rexroth Indramat data backup program. After a system crash it will be possible to restore the data.
Complete backup	The complete backup is the most extensive backup possibility. It includes all data areas. During the complete backup with an external program, the complete data area of a hard disk (complete hard disk or single partitions) is written in an image file. Besides the user data, also the operating system and the Rexroth Indramat programs including all settings are saved. This complete backup is the only possibility to restore an identical system environment after a hardware failure.

1.7 Which Data Should Be Saved?

User data	User data loaded in the control e. g. NC programs, NC variables etc. should be saved. Further user data can be found on the hard disk, e. g. NC programs/SPS programs, machine parameters, tool data, NC variable lists, configuration files, etc.
User interface data	These are program files and language files of the control interface.
Operating system data	These are program files and configuration files of the WindowsNT interface, of the network environment and the service packs.

1.8 When Should I Backup/Restore?

User data

- | | |
|----------------|---|
| Backup | <ul style="list-style-type: none"> • for archiving when the project is finished • after setup • before testing • before executing software and firmware update • cyclically in certain time intervals |
| Restore | <ul style="list-style-type: none"> • after an incorrect software and firmware update • after an incorrect operation • after replacing SPS, NC or drives with firmware • after replacing a hard disk with pre-installed software |

Complete backup

- | | |
|----------------|---|
| Backup | <ul style="list-style-type: none"> • cyclically in certain time intervals • before replacing hardware, e. g. larger hard disk • after handing over to the customer |
| Restore | <ul style="list-style-type: none"> • after a hard disk failure • after a complete control system crash • for duplicating a control system |

Note: Please consider the licensing agreement of the operating system and of the Rexroth Indramat software when a hard disk or a partition is duplicated.

1.9 Where Should I Backup?

Diskette

- Appropriate for small data amounts e. g. user data
- Easy handling
- Inexpensive data storage medium

Hard disk

- Large memory capacity
- Fast medium
- All stations of a transfer line can be saved centrally.

MO Drive

- Safe medium (40 years archiving period guaranteed)
- Can be re-written as often as you like
- No additional PC necessary with local data backup
- Large memory capacity (640 MB). About 450 MB must be currently available for a complete data backup (not compressed).

2 Backup Strategies

2.1 Chapter Overview

This chapter informs you which data is to be saved on which data storage medium.

For the data backup the following procedures are available. Corresponding to the data extent, the data can be saved on diskette, on MO connected to the BTV or via Ethernet on a backup PC.

2.2 Backup on Local Data Storage Mediums

Which data is saved? The user data from the control and the drives on the hard disk of the BTV is saved on external data storage mediums by the data backup program delivered along with the software. Corresponding to the data extent, various data storage mediums can be used.

Where is data saved

- Diskette
- MO drive (rewritable optical disk)

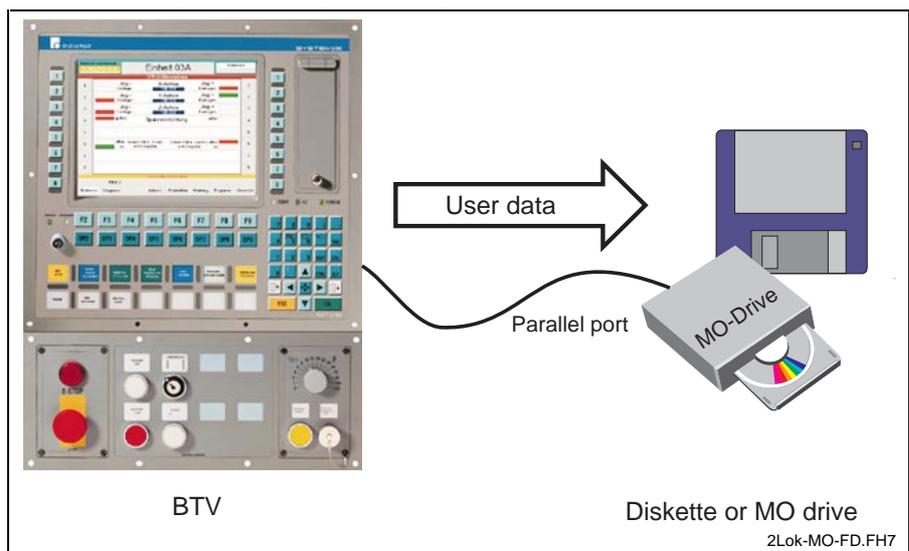


Fig. 2-1: Local backup on diskette or MO drive

2.3 Backup with Ethernet on BTV or Master Control

Which data is saved? With stations networked by Ethernet, the user data of the individual stations can be saved on data storage mediums of the master control. Furthermore the image files of the complete backup can be transferred to the master control.

Where is data saved For the data backup a MO drive connected to the master control is used.

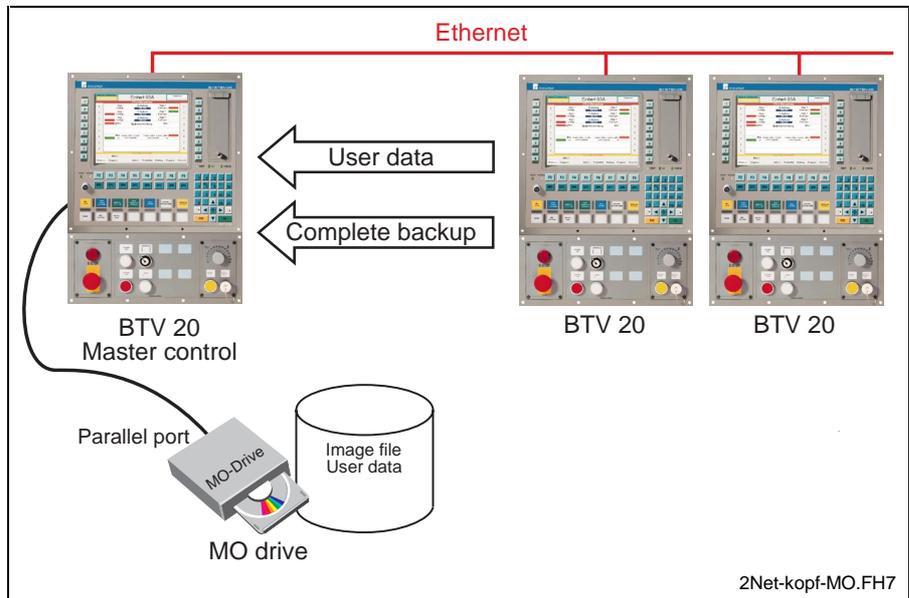


Fig. 2-2: Backup to MO drive of the master control

2.4 Backup with Ethernet on Backup PC

Which data is saved? As an alternative, a backup PC connected to the network can save the user data of the individual stations and the image files of the complete backup.

Where is data saved The hard disk of the PC can also be used for the backup if it offers enough disk space. The use of an MO drive is also reasonable with an own medium for each station.

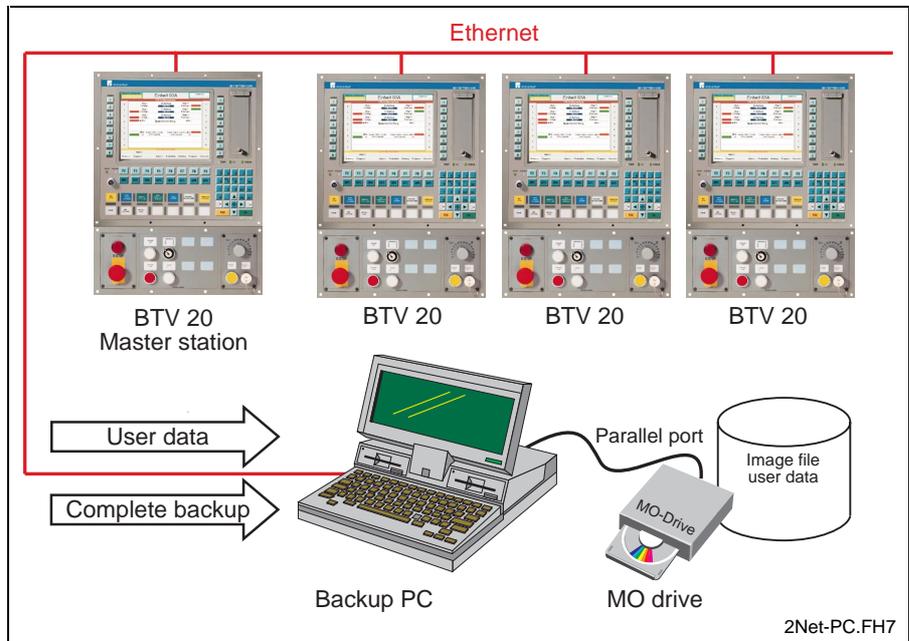


Fig. 2-3: Backup on hard disk or MO drive of the backup PC

3 Archive User Data

3.1 Chapter Overview

This chapter describes how the user data is archived (backup and restore) with the help of the archive program delivered with the control.

3.2 Procedure

With the help of an archive program, data files on the hard disk are saved and can be restored if necessary. The files are compressed and copied to the data storage medium. For archiving diskettes, hard disks or MO drives can be used as data storage mediums.

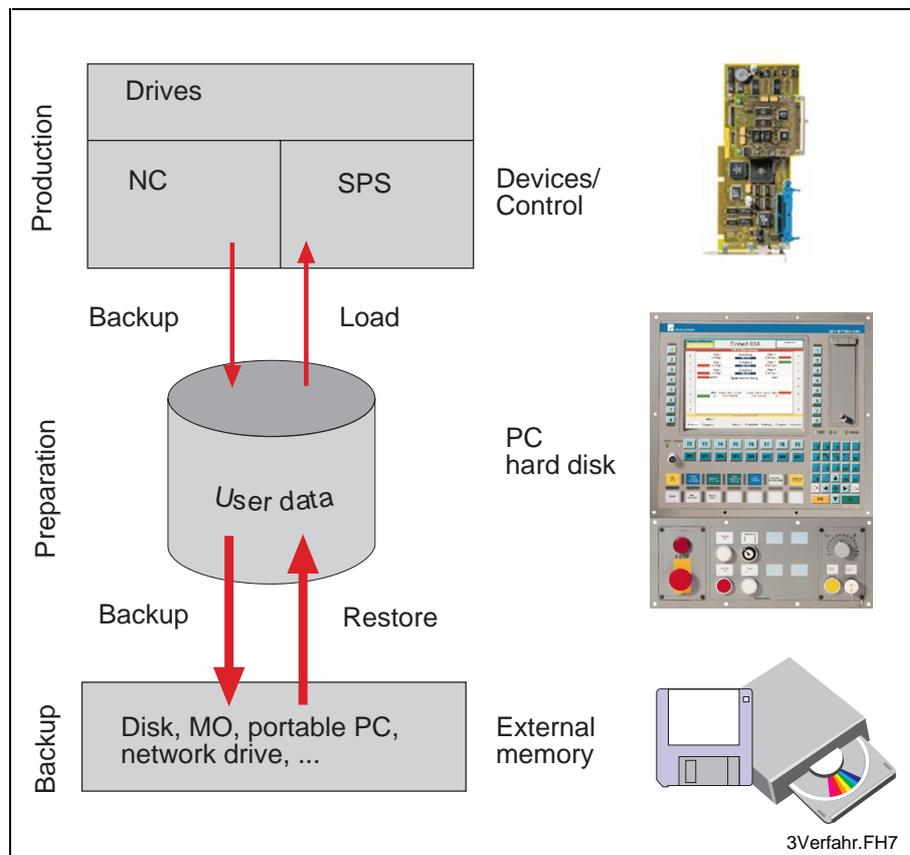


Fig. 3-1: Archiving procedure

Not Included Data in the Archive

Not all data of the complete system is saved with the archive function. Optional Rexroth Indramat systems e. g. Dolfi, Application Builder, Screen Manager and SFP are not saved. External programs e. g. NC programming systems ARTIS, external SFP etc. are also not saved. This data is only included in a complete backup (see chapter 4).

Preparation

Before the backup, the data modified within the control (NC variables, NC events, D corrections, tool lists, zero offset data, machine data, remanent SPS data, SERCOS parameter) must be saved on the hard disk. For this the corresponding menus are available or the archive function (menu item 1 **Archive**) in the MUI can be used. The SERCOS parameters are saved in menu item 5 **machine parameter processing** under **drive parameter** instead of menu item 1 **archive**.

Backup

The backup consists of two steps. The data to be saved is indicated in a batch file. First all data to be saved is copied to a temporary directory on the local hard disk. In addition to the temporary directory, the structure file "archive.asl" is created. This structure file includes all necessary information about the saved data (e. g. origin, date etc.). The files are not compressed unless all files to be saved are available. The complete content of the temporary directory is always compressed. The result is a ZIP file. A ZIP file which exceeds the size of the storage medium selected will be divided for multiple data storage mediums automatically. When the compressing is finished, the temporary directory and all sub-directories are deleted.

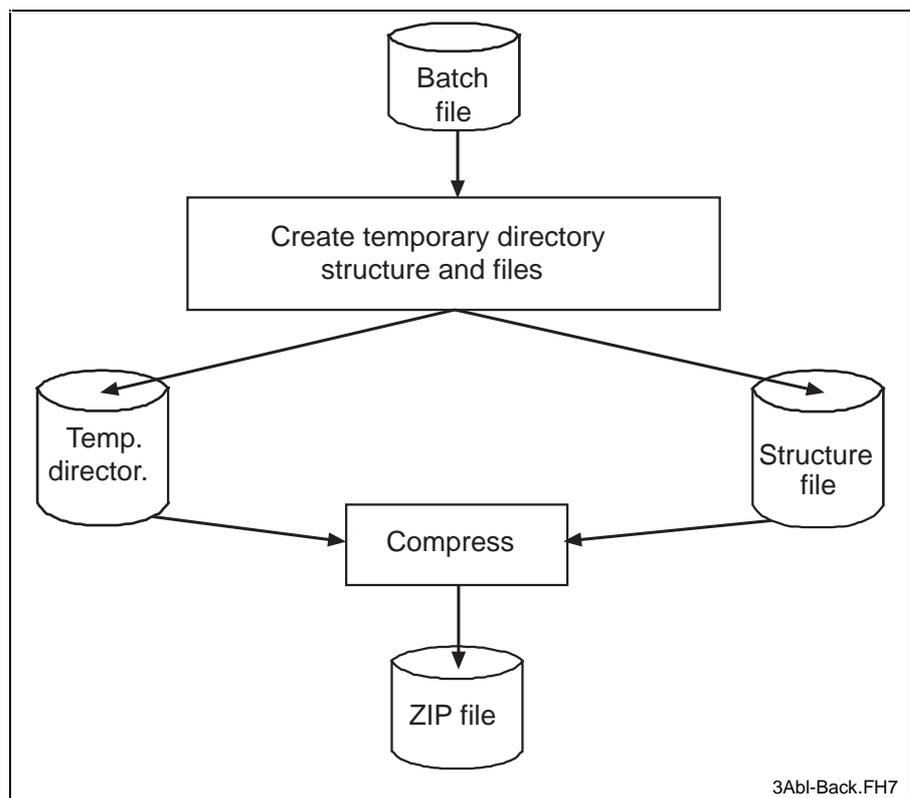


Fig. 3-2: Procedure of user data backup

Restore

Starting with the selected archive file (ZIP file) the files are decompressed in a temporary directory. The complete content of the archive file is always decompressed. Single files cannot be restored. If all files are decompressed faultlessly, the files are copied to the destination directories. If the files have been copied successfully, the temporary directory will be deleted.

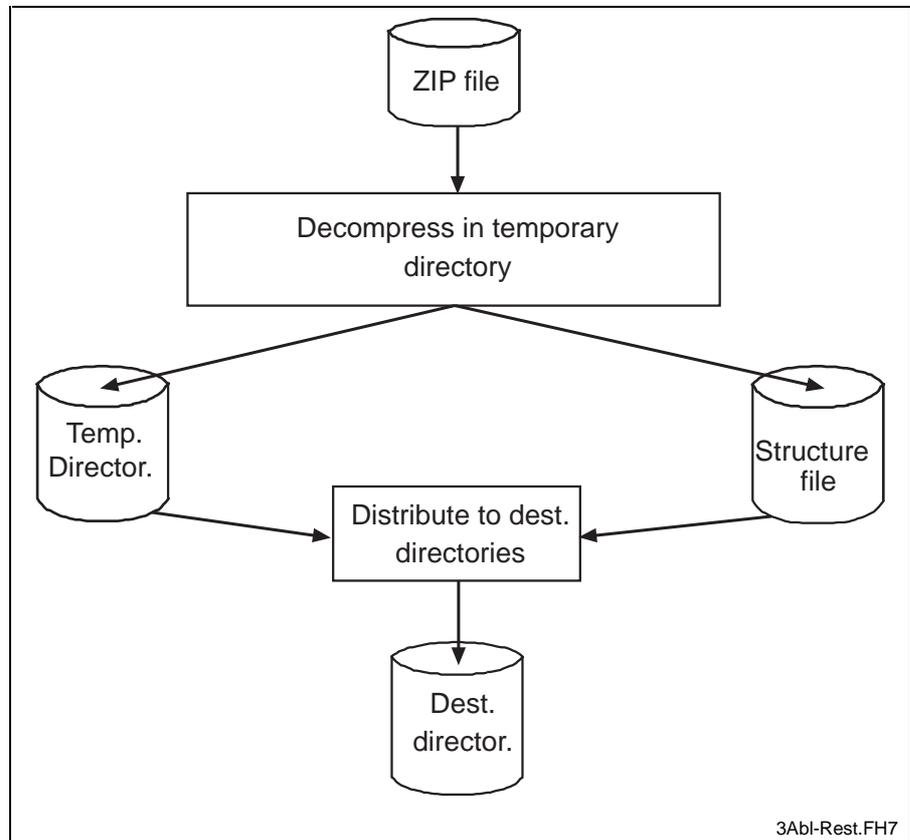


Fig. 3-3: Procedure of user data restore

Restore data in the control

After the restore, the data modified within the control (NC variables, NC events, D corrections, tool lists, zero offset data, machine data, remanent SPS data, SERCOS parameter) must be restored in the control. For this the corresponding menus are available or the archive function in the MUI can be used. The SERCOS parameters are restored in the file handling of menu item 5 **machine parameter - axis parameter**.

3.3 Data Selection

The files to be saved are selected in the batch files. This way the user does not have to select the individual files. A range of pre-defined batch files offers the possibility to determine the extent of the backup. Individual data types e. g. NC data or individual devices up to the complete backup of all devices can be selected. The data packages can be selected in a list field.

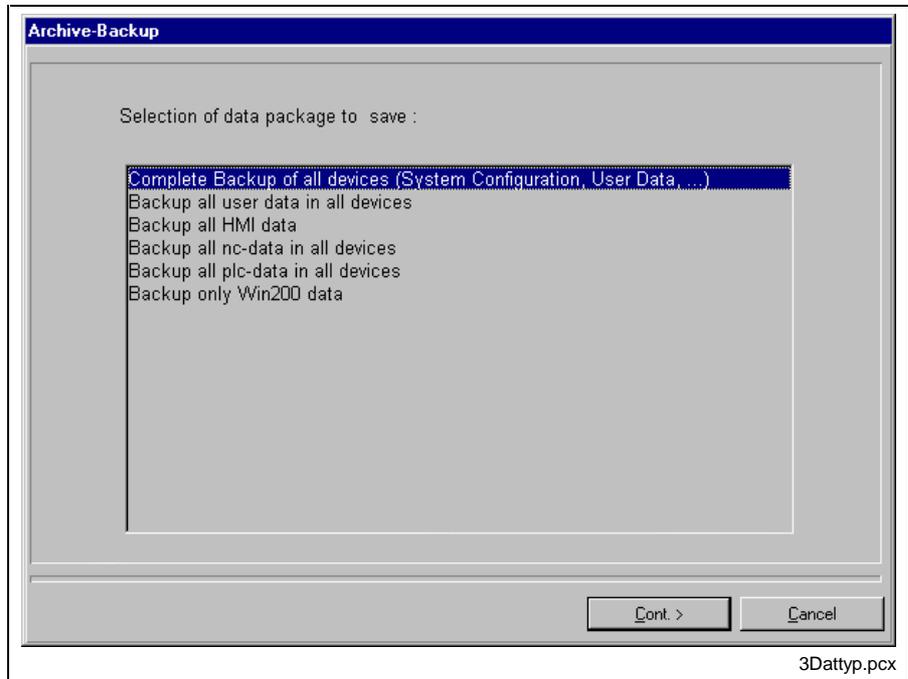


Fig. 3-4: Data packages selection in list field

3.4 Batch Files

Besides the pre-defined batch files for the backup of individual data types or devices there are two user specific files. With these definable batch files the user can create an own backup selection. The batch files are called „BACKUP_USER_DEF_1.ASD“ and „BACKUP_USER_DEF_2.ASD“. They are located in the <Drive>\MT-CNC\INDRAMAT\System200\BasicData\Resource directory. ASD files are ASCII files and can be modified in an editor.

```

...
$BASE$\CYCLE\*. * /- /SUB
;Save Basic Directory's
$BASE$\ANLAGE00\ /DIR
$BASE$\ANLAGE00\DIAG\ /DIR /DEL
$BASE$\ANLAGE00\NCPRG\ /DIR /DEL
$BASE$\ANLAGE00\PARAM\ /DIR /DEL
...
DEVICE 00
$BASE$\ANLAGE00\DIAG\*. * /-
$BASE$\ANLAGE00\NCPRG\*. * /-
$BASE$\ANLAGE00\PARAM\*. * /-
...

```

Fig. 3-5: Extract of batch file "BACKUP_USER_DEF_1.ASD"

File Structure

The file consists of individual command lines in which the files/directories to be saved are indicated.

Syntax <Path(logical path)><File><Space character><Switches>

Example:

```
$BASE$\CYCLE\*. * /- /SUB
```

Rules

Paths Path information must always be given as logical paths, it is not allowed to name physical paths.

Logical path information is given at the beginning of the command line and is enclosed by "\$" characters.

File names File names can be indicated with wildcards (e. g. *.* , *.dat, ...).

Comments Blank lines and comments are ignored.

Comments are introduced by a ";" character, the character may be positioned at the beginning of the comment line or at the end of the comment line.

Example:

```
; a comment line
```

```
$BASE$\*. * /SUB; comment within a command line
```

Switches

Besides path and file information it is also possible to add additional information to the command line in switches.

/SUB Possibly existing subdirectories are considered.

/- If a file does not exist, it will be ignored, otherwise an error message is displayed.

/DIR The directory indicated in the comment line is always created during restore if it does not exist. This does not depend on the fact whether there are files in the directory or not. Files which are to be copied into this directory must also be indicated in a separate command line additionally.

This switch does either stand alone or in connection with /DEL.

/DEL During restore, the directory is emptied, possibly existing files are deleted.

Example of a batch file:

```
;Area Files
```

```
$Area$\*. * /SUB
```

```
;Base Files
```

```
$Base$\*.txt /SUB
```

```
$Base$\*.doc /-
```

```
;Drive
```

```
$Drive$\mt_texte\anlage.dat
```

Areas

Physical path information is replaced by logical path information. It is splitted as follows:

Area \$Area\$: replaces the directory ... \SYSTEM200

e.g. \$Area\$*. * /SUB: saves all files in the directory ... \SYSTEM200 including possibly existing subdirectories

- Base** \$Base\$: replaces the setup directory \MT-CNC
e. g. \$Base\$.txt /SUB:* saves all files with the extension "TXT" in the setup directory ... \MT-CNC including possibly existing subdirectories
- Drive** \$Drive\$: replaces setup drive D:
e. g. \$Drive\$\mt_textelanlage.dat: saves the file ANLAGE.DAT in the setup directory in the subdirectory \MT_TEXTE

3.5 Execute Backup

Requirements

- The files to be saved must be hard disk data. Therefore user data of control and drives must be saved on the hard disk prior to archiving (menu item **1 = archive** in MUI, menu item **5 = machine parameter - drive parameter** for SERCOS parameters).
- The backup program requires unlimited and exclusive access to the files to be saved. Therefore it is necessary that all active applications (user interface, function interface, system configurator) are terminated.
- The memory of the drive to be archived must be sufficient (hard disk, MO drive). Furthermore the program requires enough memory for the temporary archive of the files to be saved on the hard disk. During a backup to a disk drive, multiple diskettes must be available. The diskettes do not have to be formatted. The formatting can be executed by the program if you wish.

Note: The diskettes of the archive must be labelled clearly, so the correct diskette will be inserted when prompted.

⇒ Label a number of diskettes by numbering them.

Operation of the backup program

The backup is executed with assisted dialogs. This guarantees an easy handling. After selecting an option, the button **Next** leads to the next dialog. The button **Back** leads to the previous dialog. In the last dialog the archiving is started with the settings made before by pressing **Execute**.

Save Control Data on Hard Disk

The data modified within the control (NC variables, NC events, D corrections, tool lists, zero offset data, machine data, remanent SPS data, SERCOS parameter) must be saved on the hard disk before executing the backup. For this the archive function of the MUI is used.

Note: Please also refer to the documentation "Archive Functions, type DOK-MT*CNC-BOF*ABL*V16-ANW1-EN-P".

⇒ Press F1 **Archives Administration** in the MUI main menu
 The archiving main menu is displayed.



Fig. 3-6: The archiving main menu

⇒ Press F6 **CNC => NC-Data**

The upload for the individual data will be executed.

The SERCOS parameters are saved in menu item 5 **machine parameter processing** under **drive parameter** instead of the archive function.

Call Backup Program

The backup program is called in the Windows start menu.

⇒ Open the backup program with the menu sequence **Start - Programs - Indramat - Backup**

The program is loaded. A dialog window with a selection list of pre-defined data packages is displayed.

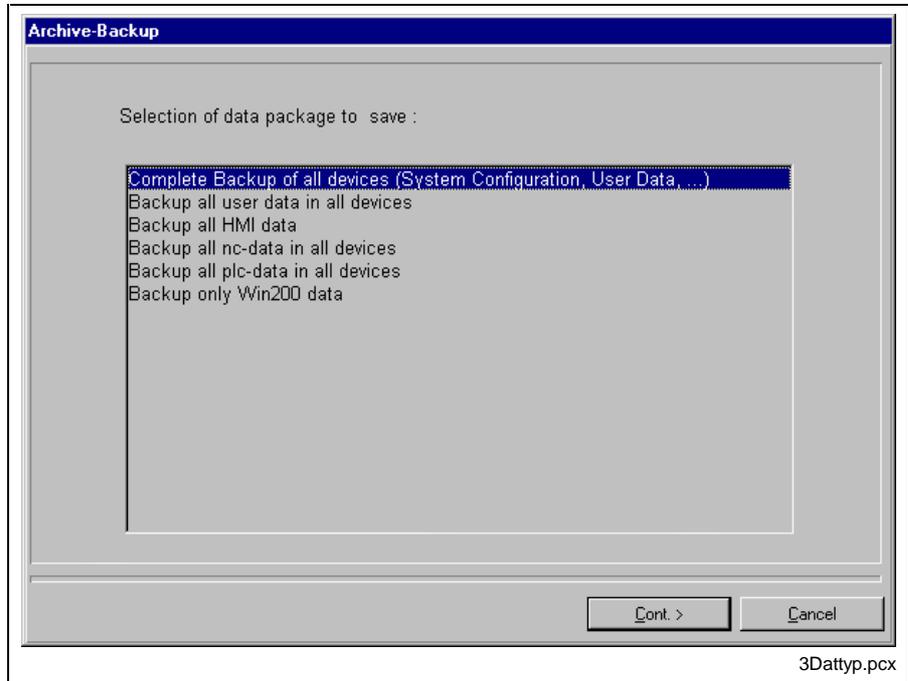


Fig. 3-7: Selection list of data packages

⇒ Select the data package to be archived by marking it and pressing **Next**.

A dialog window for the selection of the file archive is displayed.

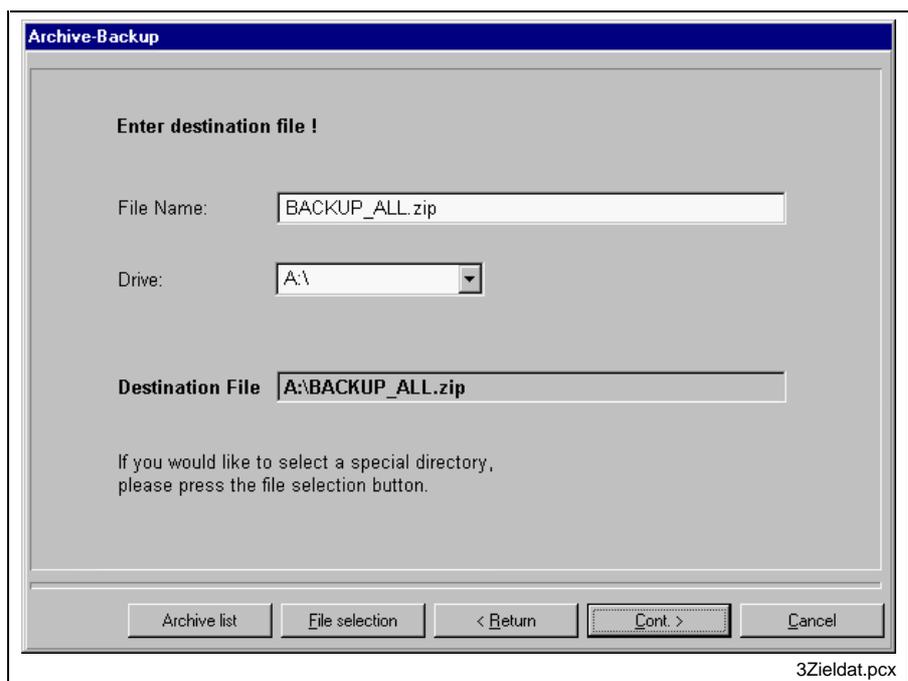


Fig. 3-8: Selection dialog for the destination file

For the destination file selection you have three possibilities.

Three possibilities to select an archive

- ⇒ You apply the proposal for file name and drive or you enter a new file name and drive. The proposal for the file name corresponds to the selection of the data package.
- ⇒ The **archive list** button opens a list with the archives created before. It offers an overview and you have the possibility to select an existing archive. This archive will be overwritten.

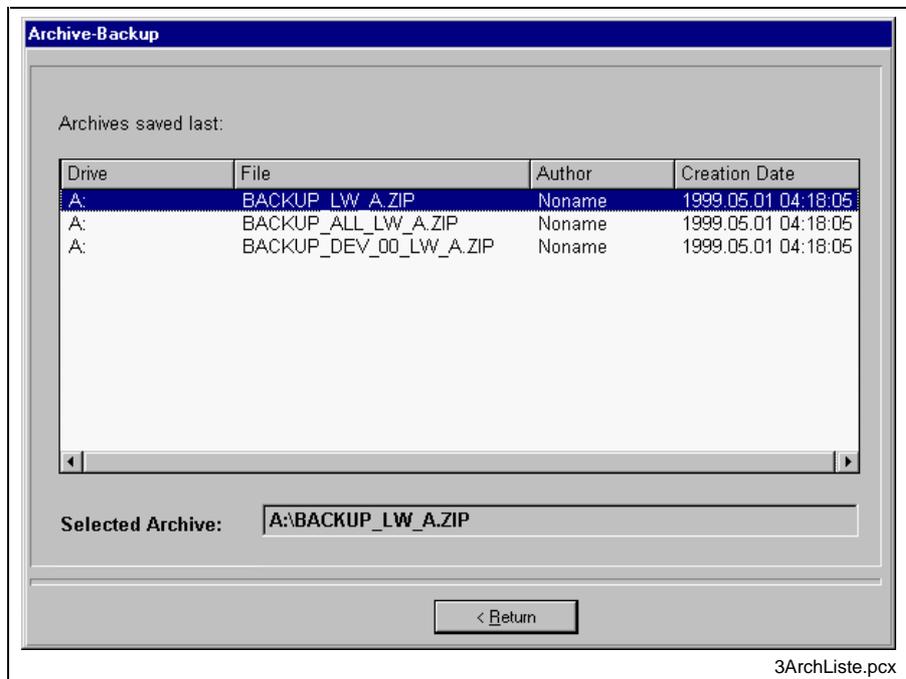


Fig. 3-9: Selection list for file archive

- ⇒ Create a new archive by opening a file selection window with the **Browse** button and determine drive, directory and file name. Also a file name for the archive file is proposed. It is possible to save through the network. During the backup on a network drive, the drive is connected.

Note: In order to enable the operation of a PC interconnection, the drive must be disconnected manually in Windows NT exploring after archiving is finished.

- ⇒ Select one of the three possibilities.
Independent of the possibility you select, an entry field for additional file information is displayed.

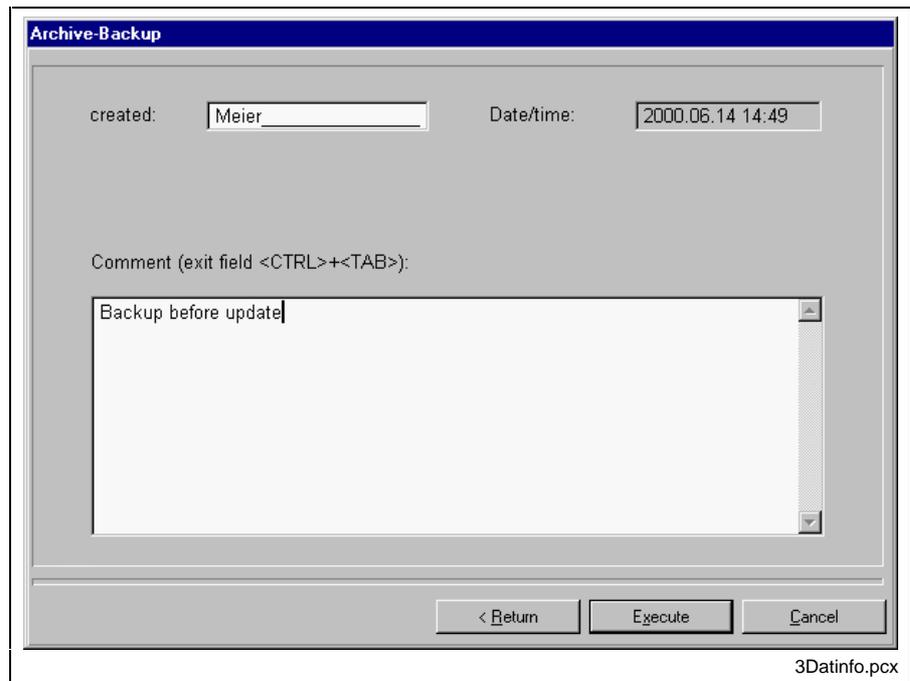


Fig. 3-10: Entry dialog for file information

⇒ Enter the name of the author; date and time will be entered automatically. Enter a comment text in the text field and confirm the button **Execute**.

The archive function is started. The data is copied to a temporary directory.

If a floppy drive has been selected as backup destination drive, a prompt will be displayed asking whether the diskette should be formatted.



Fig. 3-11: Prompt dialog for formatting

⇒ Confirm **OK** if the diskette is to be formatted

- or -

press **Cancel** if formatting is not required.

⇒ Insert the first diskette into the drive as soon as it is requested and confirm with **OK**.

The compression procedure is introduced now. A dialog window with progress-bar control informs you about the archiving progress. If the backup file must be saved on multiple diskettes, new diskettes will be required. When the archiving is finished, the file information window is displayed again.

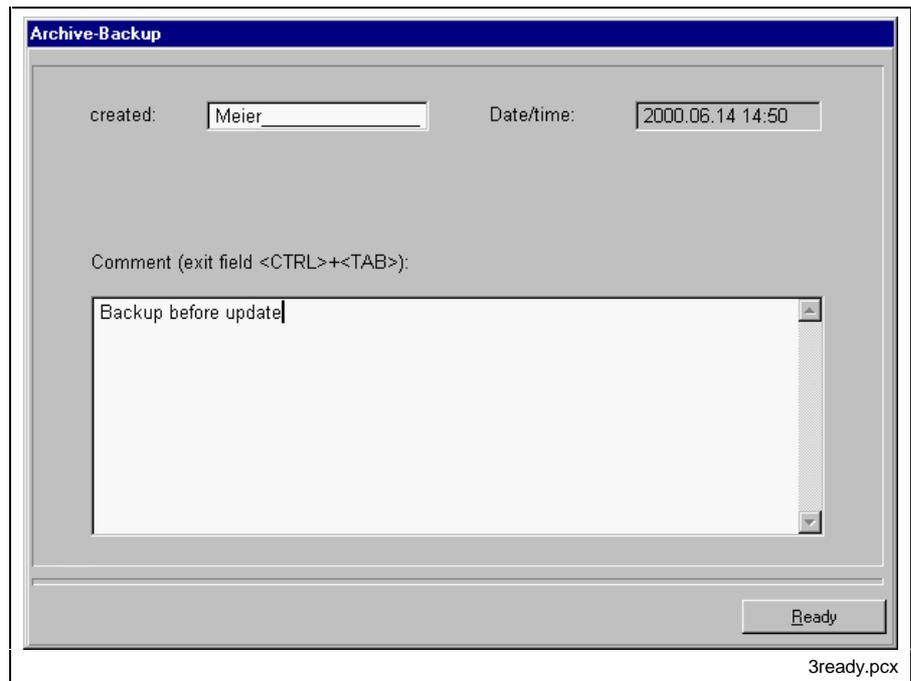


Fig. 3-12: Finished dialog after finishing the backup

- ⇒ Terminate the archiving by pressing **Finished**.
The archiving is terminated now, the program is exited.

3.6 Execute Restore

Requirements

- The restore program requires unlimited and exclusive access to the files to be saved. Therefore it is necessary that all active applications (user interface, function interface, system configurator) are terminated.
- The drive with the archived data must be ready (MO drive switched on). If the data is saved on diskettes, the diskettes must be available.

Note: Labels are assigned to the backup diskettes by the program. This designation is required for the restore process. If diskettes are copied or forwarded electronically, the labels of the diskettes must be forwarded too.

Operation of the Restore program

The restore is also executed with assisted dialogs. After selecting an option, the button **Next** leads to the next dialog. The button **Back** leads to the previous dialog. The archiving procedure is started in the last dialog by pressing **Execute**.

Call Restore Program

The restore program is called in the Windows start menu.

⇒ Open the program with the menu sequence **Start - Programs - Indramat - Restore**

The program is loaded. The dialog window with the selection list of available file archives is displayed.

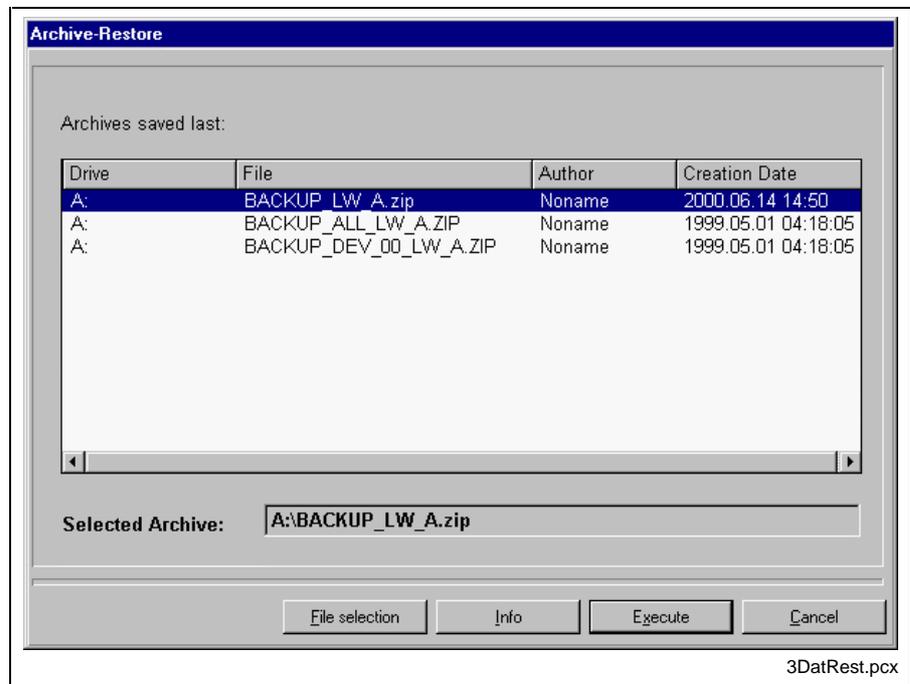


Fig. 3-13: Selection list for file archive

In the selection list all created archive files are represented.

⇒ Select the archive to be restored from the list

- or -

⇒ confirm the **Browse** button in order to select a valid ZIP archive which is not shown in the list. If the ZIP archive is saved on a diskette, you are prompted to insert the last diskette of the archive into the floppy drive first. The program requires this diskette in order to determine the extent of the archive. After the archive selection, the file information window is displayed.

⇒ Confirm the button **Execute** for starting the restore function.

⇒ Confirm the dialog with the last data storage medium with **Yes** if the archive is located on the inserted data storage medium. Otherwise change the data storage medium.

Note: Rarely you are prompted several times to change the diskettes. This cannot be avoided if the internal ZIP archive file is divided on two diskettes.

The ZIP data is copied to a temporary directory and afterwards to the destination directories. The procedure is represented in a progress-bar control.

When the restore is finished, the file information window will be displayed.

⇒ Terminate the restore by pressing **Finished**.

The restore procedure is terminated now, the program is exited.

Restore Control Data

After the restore the data modified within the control (NC variables, NC events, D corrections, tool lists, zero offset data, machine data, remanent SPS data) must be restored in the control. For this the archive function of the MUI is used.

⇒ Press **F1 Archive Administration** in the main menu.

The archiving main menu is displayed.



Fig. 3-14: The archiving main menu

⇒ Press **F6 NC-Data => CNC**

The download for the individual data will be executed.

The SERCOS parameters are restored in the file handling of the machine parameters.

4 Complete Backup

4.1 Chapter Overview

This chapter describes the complete backup with the help of external data backup programs.

4.2 Procedure

- Backup** With the help of an external program, individual partitions of a hard disk or the complete hard disk are written into an image file. This image file represents a complete copy of the data storage medium. All system data and system settings are saved. Besides the program data and user data of the control software, the programs and the settings of the operating system and possibly existing external software are also saved.
- Restore** When data is lost or the hard disk is replaced, the image file is restored on the data storage medium.

Procedure Overview

During the complete backup, all system data is saved. Therefore all files must be closed and the system must be shut down. The system is started at the work station with the help of a boot diskette. The boot diskette includes all necessary programs and device drivers for the data backup. The data backup program creates an image file which is saved on the data storage medium. If a MO drive is used for the backup, an individual data storage medium is used for each station.

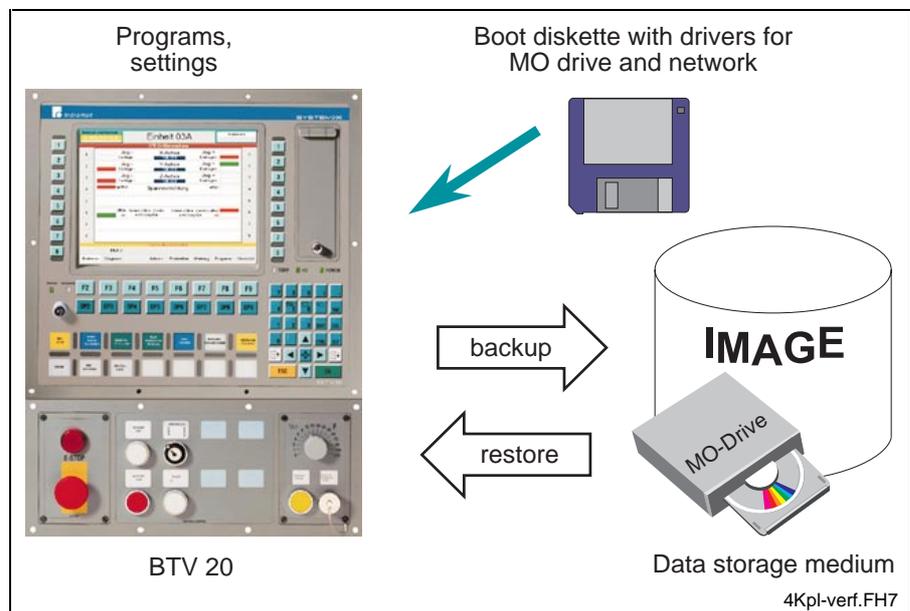


Fig. 4-1: Overview of data backup procedure

- Backup - Save Data**
- i. Shut down system
 - ii. Start station with boot diskette
 - Operating system is being loaded
 - Network drivers are being loaded
 - Device drivers for MO drive are being loaded
 - iii. Load data backup program
 - iv. Execute backup interactively or with batch file

- Restore - Restore data**
1. Shut down system
 2. Start station with boot diskette
 - Operating system is being loaded
 - Network drivers are being loaded
 - Device drivers for MO drive are being loaded
 3. Load data backup program
 4. Execute restore interactively or with batch file

Depending on the system configuration, the data backup is executed on local data storage mediums or on a data storage medium connected by Ethernet.

Local Data Storage Mediums

With individual systems, the data backup is executed on a mass storage connected to the BTV. A second hard disk in the BTV is also suitable.

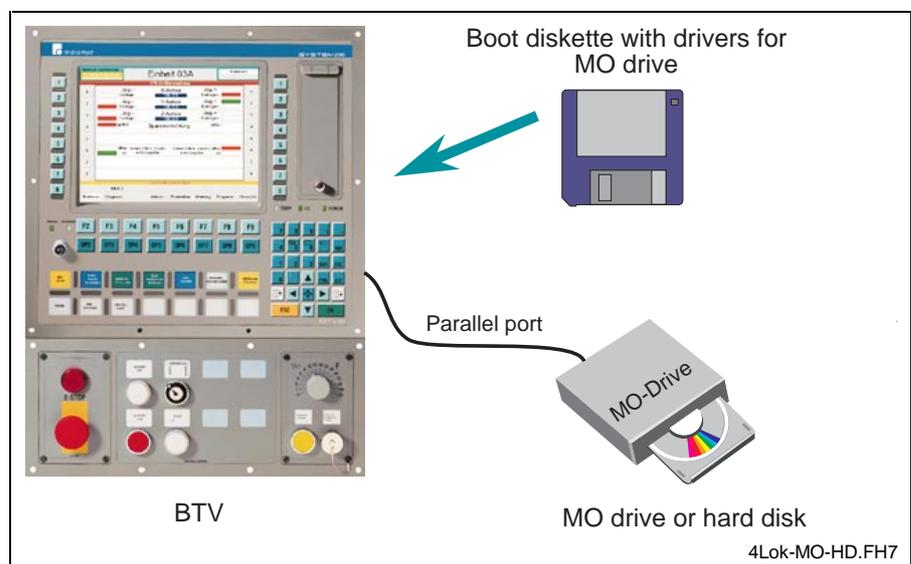


Fig. 4-2: Local data backup on MO drive or second hard disk

Data Storage Mediums in the Network

With networked systems, a central data backup via Ethernet is recommended. The mass storages of a backup PC in the network or MO connected to the master control can be used. The advantages and disadvantages of data backup via the data network are as follows:

Advantages

- Only one mass storage is necessary at a central location
- The mass storage (MO drive) does not have to be connected at each station

Disadvantages

The network connection must be created under MS-DOS; for this an additional program (MS-CLIENT) is necessary.

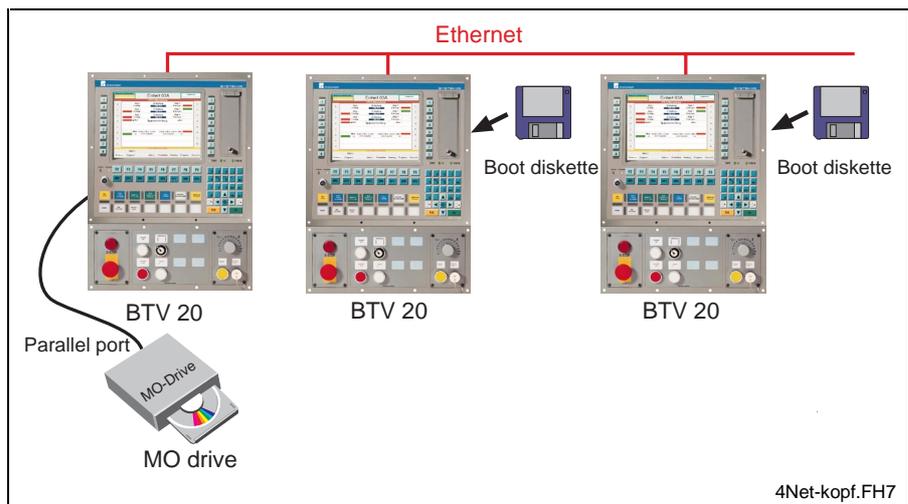


Fig. 4-3: Data backup on MO drive of the master control

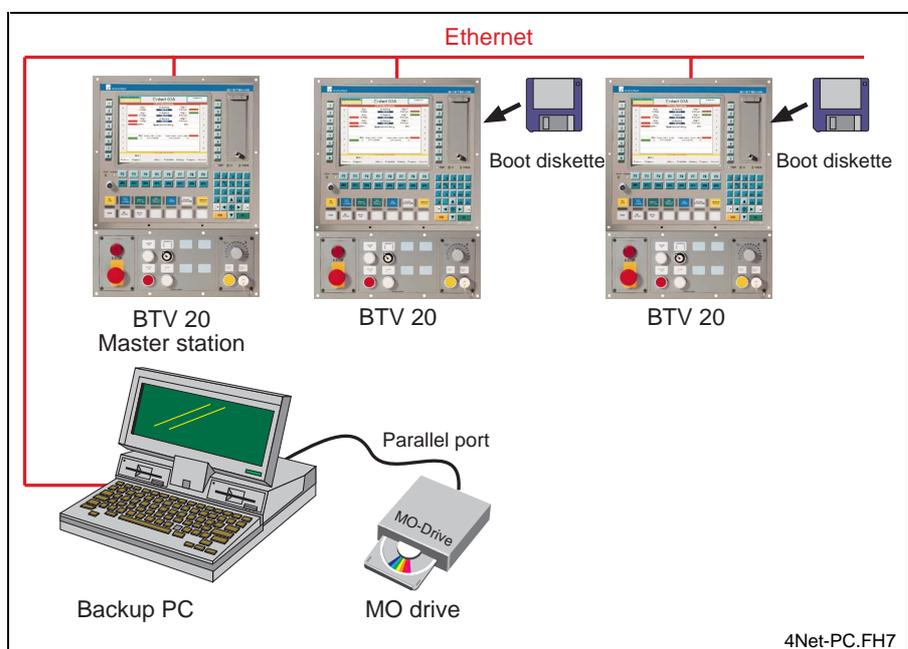


Fig. 4-4: Data Backup on hard disk or MO drive of the backup PC

4.3 Hardware and Software Requirements

The components described as follows must be available for a data backup with the configuration shown.

For the data backup on a MO drive connected to the work station you need:

- a bootable diskette
- MO drive with Disk 640 MB (Fujitsu M2 13)
- a backup program (Norton Ghost Pro 5.1d, DriveImage Pro 3.0, HDCOPY 2.0 Pro)

- or -

for the data backup via Ethernet on MO drive or hard disk:

- a bootable diskette
- network under DOS (created by MS-Client)
- MO drive with Disk 640 MB (Fujitsu M2 13)
- a backup program (Norton Ghost Pro 5.1d, DriveImage Pro 3.0, HDCOPY 2.0 Pro).

4.4 Programs for Data Backup

In this instruction three programs for data backup are shown. With the help of these programs, complete hard disks or individual partitions of a data storage medium can be transferred to another data storage medium. All partition data and settings of the data storage medium are saved. This allows to completely duplicate a data storage medium. Depending on the program, it offers possibilities for a complete or a differentiated data backup on various mediums and with various transfer possibilities.

The selection and the order of the programs shown in this description does not represent a value judgement. Each program has advantages and disadvantages in the individual functions. If necessary test the programs to find the program which is suitable for your requirements. The manufacturers offer free trial versions.

Note: Please also refer to the documentation of the corresponding manufacturer.

4.5 Preparations

Before the data backup can be executed successfully, some preparations must be made. In detail you must:

- create a boot diskette
- setup the network client for the image file transfer through the network
- install the drivers for the MO drive
- set the data backup program

Prepare diskettes

Depending on whether the data backup is executed at the local work station or by Ethernet, you need different diskettes. The diskettes must be bootable and must contain all system files and drivers necessary for the given configuration.

Create Diskette for Backup on MO Drive

For the data backup on a MO drive connected locally or connected at the parallel port, you need a boot diskette with the necessary device drivers. Furthermore they should contain the auxiliary program "HDPREP.EXE" for formatting the diskettes and the MS DOS files "AUTOEXEC.BAT" and "CONFIG.SYS".

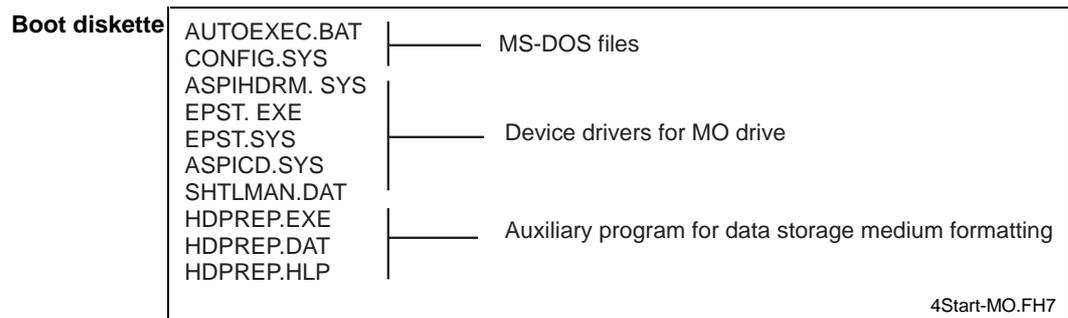


Fig. 4-5: Content of the boot diskette for local data backup on MO drive

CONFIG.SYS

```
Device = epst.sys
Device = aspihdrm.sys
BUFFERS=10,0
FILES=30
LASTDRIVE=Z
FCBS=4,0
```

Fig. 4-6: Content of the CONFIG.SYS file

AUTOEXEC.BAT

```
keyb gr
```

Fig. 4-7: Content of the AUTOEXEC.BAT file

Furthermore the diskette can contain the batch files for the backup (BACKUP.BAT) and for restore (RESTORE.BAT) for the data backup program.

BACKUP.BAT

```
REM BACKUP.BAT
REM saves the complete hard disk in an image file on MO
drive E:
ghost -xint13on -sure -z1
-clone,mode=dump,src=1,dst=E:\BTV01.IMG
```

Fig. 4-8: Example for a batch file BACKUP.BAT

RESTORE.BAT

```
REM RESTORE.BAT
REM Restore of the complete hard disk from an image file
from MO drive E:
ghost -xintl3on -sure
-clone,mode=load,src= E:\BTV01.IMG,dst=1
```

Fig. 4-9: Example for a batch file RESTORE.BAT

- ⇒ Copy the data backup program to this diskette. If you also copy an ASCII editor (for adjusting the batch files) to the diskette, you have all necessary files for the data backup on one diskette.

Create Diskette for Data Backup with Ethernet

For the data backup with Ethernet you need a bootable diskette with drivers and system files for a network under MS-DOS. A network under DOS can be created with the Microsoft product MSCLIENT. MS-CLIENT is included in the program package "WINDOWS NT SERVER" and can be found on the installation CD.

The network client must be configured for the network card in use. The necessary system programs and drivers can be saved on one boot diskette. For a network card SMC9000 the diskette must have the following content (see Fig. 4-10: Content of the boot diskette for network operation).

- ⇒ Create a network diskette with the help of MS-CLIENT
- ⇒ Compare the content of the network diskette and the content of the files AUTOEXEC.BAT, CONFIG.SYS, SYSTEM.INI and PROTOCOL.INI with the listings of the following figures and adjust them if necessary.

If you need another configuration e. g. because you are using another network card, call SETUP.EXE in order to configure the MS-CLIENT again.

Boot diskette

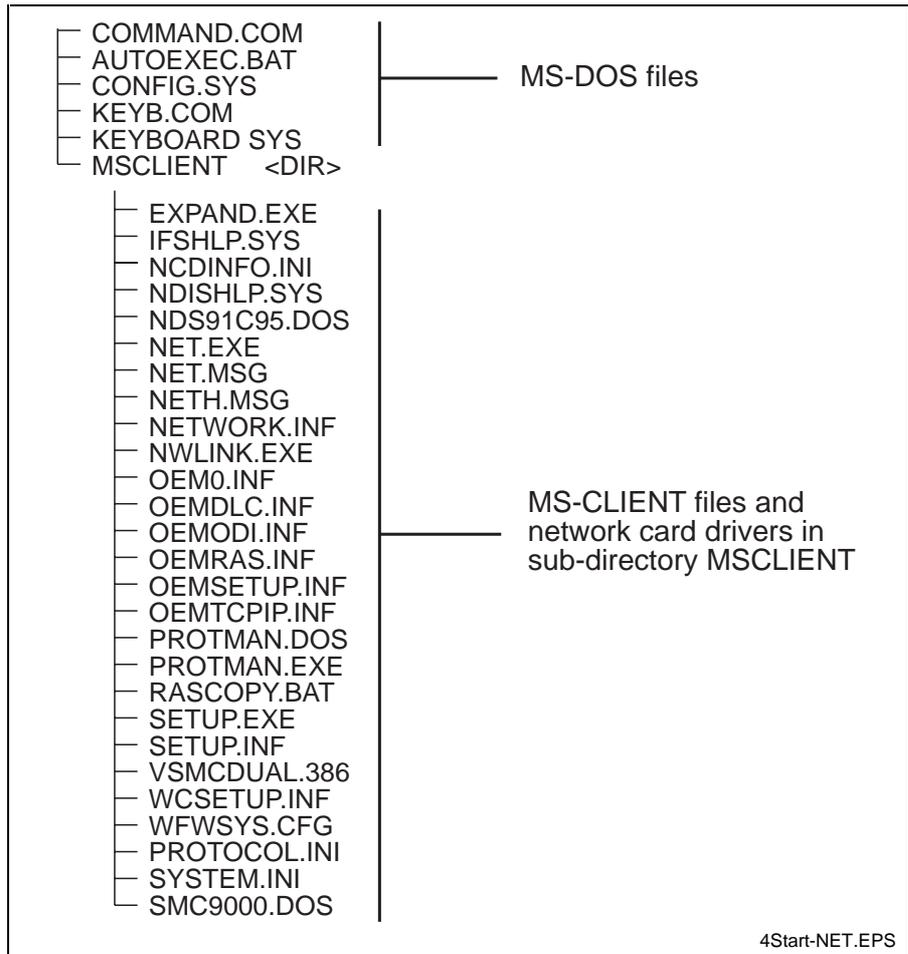


Fig. 4-10: Content of the boot diskette for network operation

CONFIG.SYS

```

BUFFERS=10,0
FILES=30
LASTDRIVE=Z
FCBS=4,0
DEVICE=A:\MSCLIENT\IFSHLP.SYS
    
```

Fig. 4-11: Content of the CONFIG.SYS file

AUTOEXEC.BAT

```

PATH=A:\;A:\MSCLIENT
keyb gr
A:\MSCLIENT\NET INITIALIZE
A:\MSCLIENT\NWLINK
A:\MSCLIENT\NET START
A:\MSCLIENT\NET
    
```

Fig. 4-12: Content of the AUTOEXEC.BAT file

PROTOCOL.INI

```

[network.setup]
version=0x3110
netcard=smc9000,1,SMC9000,1
transport=ms$nwlink,MS$NWLINK
transport=ms$ndishlp,MS$NDISHLP
transport=ms$netbeui,MS$NETBEUI
lana0=smc9000,1,ms$nwlink
lana1=smc9000,1,ms$ndishlp
lana2=smc9000,1,ms$netbeui
[MS$NWLINK]
FRAME=ETHERNET_802.2
DriverName=nwlink$
BINDINGS=SMC9000
[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP
[SMC9000]
DriverName=SMC9X$
IOBase=0x280
[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=SMC9000
[MS$NETBEUI]
DriverName=nnetbeui$
Sessions=10
NCBS=12
BINDINGS=SMC9000
LANABASE=1

```

Fig. 4-13: Content of the PROTOCOL.INI file

SYSTEM.INI settings

Network settings must be adjusted in the MS-CLIENT file SYSTEM.INI (in the \MSCLIENT directory on the diskette).

⇒ Overwrite the default settings with the correct values for the network you are using. In case of doubt consult a network administrator.

The following settings must be modified:

- Computer name
- User name
- Workgroup

The following figure shows the lines (marked) where modifications are necessary.

```
[network]
sizworkbuf=1498
filesharing=no
printsharing=no
autologon=yes
computername=MAHO
lanroot=A:\MSCLIENT
username=Wirthmann_Egon
workgroup=ESM1
reconnect=yes
dospophotkey=N
lmlogon=0
logondomain=
preferredredir=full
autostart=
maxconnections=8
[network drivers]
netcard=SMC9000.dos
transport=ndishlp.sys,*netbeui
devdir=A:\MSCLIENT
LoadRMDrivers=yes
[Password Lists]
*Shares=A:\MSCLIENT\Share000.PWL
SYSTEM200=A:\MSCLIENT\SYSTEM20.PWL
```

Fig. 4-14: SYSTEM.INI settings of MS-CLIENT

Transfer Operating System to Diskette

For starting the system, the diskettes for MO and network operation should include the operating system. For this, the DOS command "SYS.COM" should be used in a MS DOS system. In this way, the operating system is transferred to diskette.

⇒ Create one bootable diskette with the operating system MS-DOS for each of the starting diskettes for network and MO operation.

4.6 The Program Norton Ghost 5.1d

The program Norton Ghost 5.1d from Symantec is a DOS program. It is not possible to start it in the DOS window under Windows NT. Windows NT does not allow exclusive access to data mediums. For the program settings and the data backup two modes are available.

- | | |
|------------------------------|--|
| Interactive operation | The software is set and operated via menu calls. The selection of the data areas to be saved and the settings of the destination drives, etc. are executed by the program in dialogs. |
| Batch operation | For a fast automatic procedure, the program can be started in batch mode. In a batch file various parameters can be added to the call name of the program. By calling the batch file, the backup and/or restore operation can run automatically. |

Setup Diskette for Ghost

The DOS program Ghost does not have to be installed. It fulfills the duty to copy the program file "GHOST.EXE" to a formatted diskette. For the data backup on a local MO drive, Ghost can be copied to the starting diskette. The disk space of the starting diskette for network operation is not sufficient. For Ghost you must insert a second diskette.

Adjust the software to your requirements by selecting program options interactively or by setting call parameters.

Set Options for Interactive Operation

The program options are determined in the **Options** menu.

For example you can set that the image file is divided on multiple data storage mediums (spanning) or that safety prompts are not displayed (sure).

⇒ Select the **Options** menu.

An entry field with flags is displayed.

⇒ Move from flag to flag with the Tab key

The active handle is illuminated, a help text is displayed as balloon help.

⇒ Confirm Enter in order to activate the option.

A check mark displays that the option has been selected.

⇒ Set the required options

⇒ Confirm the **Accept** button

The settings are applied.

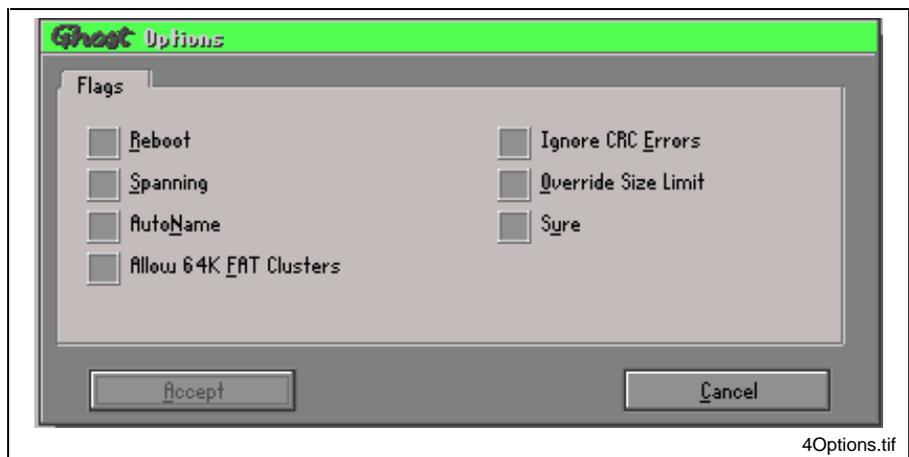


Fig. 4-15: The settings in the "Options" menu

Create or Modify Batch File

With the help of a batch file, the program settings are added as parameters to the call names of the program. The batch file should have the following structure.

Batch File for Backup in an Image File

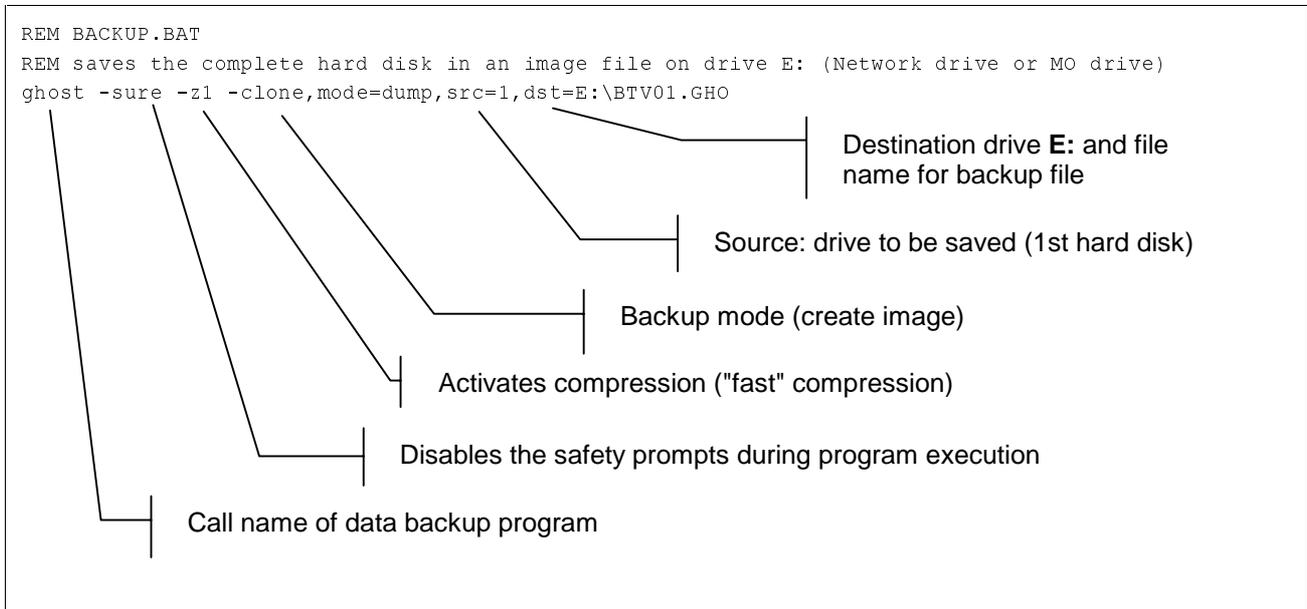


Fig. 4-16: Batch File for Backup in an Image File

⇒ Open the batch file in an ASCII editor and modify the destination drive and the file name of the backup file if necessary.

Batch File for Restoring the Data of an Image File

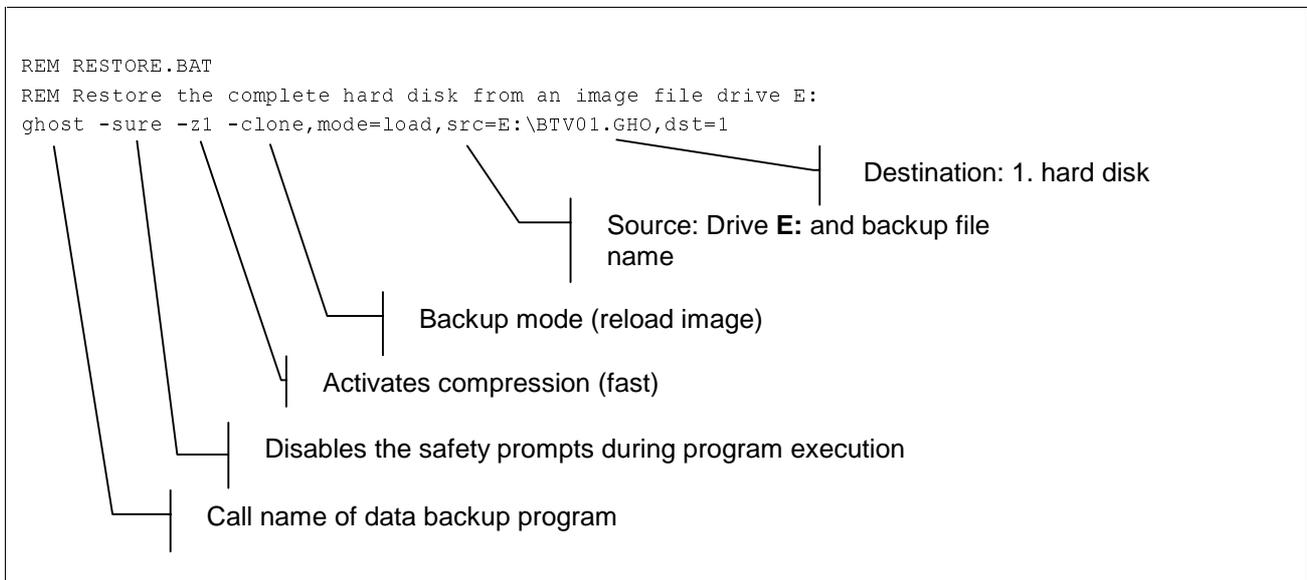


Fig. 4-17: Batch file for restoring from an image file

Optional Parameters

- span** If the disk space of the connected MO drive is not sufficient, the image file can be saved on multiple data storage mediums. For this, the parameter "-span" must be entered in the batch file.
- z** With the parameter "-z" two modes can be selected for the compression of the image file.
- z1: Compression "fast", the image file is compressed to approximately 60% of the original size. The backup time is 10% less than without compression. (Less data must be transferred through the relatively slow network connection or to the parallel connected MO drive). This compression mode is recommended.
- z2: Compression "high", the image file is compressed to approximately 50% of the original size. However, the backup takes approximately three times longer than without compression. This compression mode is not recommended.

Note: For further setting possibilities e. g. copying individual partitions, please refer to the product documentation of Ghost.

4.7 The Program DrivelImage Pro 3.0

The program DrivelImage Pro 3.0 from Powerquest can be started under Windows 95/98 from hard disk or from a bootable diskette. It is not possible to start it in the DOS window under Windows NT. Start the program under Windows NT from a bootable diskette or a bootable DOS partition of the hard disk.

For the program settings and the data backup two modes are available.

- Interactive operation** The software is set and operated via menu calls. The selection of the data areas to be saved and the settings of the destination drives, etc. are executed by the program in dialogs.
- Batch operation** For a fast automatic procedure, the program can be started in batch mode. In a batch file and a script file, various parameters can be added to the call name of the program. By calling the batch file, the backup and/or restore operation can run automatically.

Setup Diskette for DrivelImage

The program DrivelImage is installed from the installation CD. The setup program copies all necessary data to the hard disk. The setup program allows to create the necessary diskettes for diskette operation. A bootable diskette with the drivers for external data storage mediums and a program diskette for DrivelImage are created.

⇒ Select the option **Create emergency diskettes** in the setup program. Adjust the software to your requirements by selecting program options interactively or by setting call parameters.

Set Options for Interactive Operation

The program interface is similar to Windows and offers assistance; it can be operated with the keyboard or the mouse.

Advanced Options offers special settings e. g. to protect the image file with a password or to split the image file into multiple files with a fixed size each.

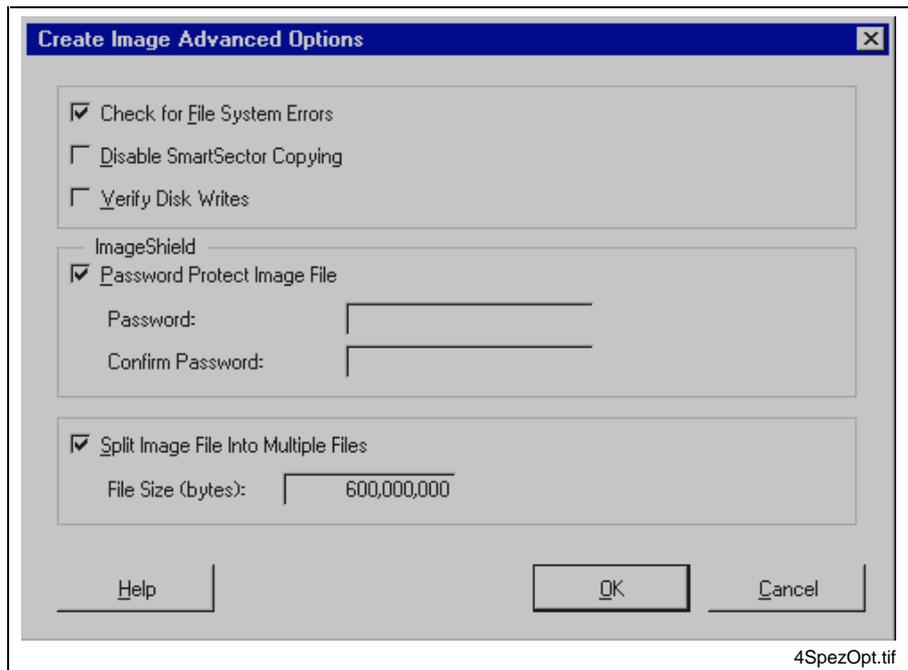


Fig. 4-18: Assisted "Advanced Options" menu

Create or Modify Batch File

With a batch file or a script file the program settings can be attached to the program call. The batch file should have the following structure.

Batch File for Backup in an Image File

The following figure shows a simple batch file. With this batch file the complete hard disk (all partitions) with the main program settings are written in the image file BTV01.PQI on drive E:.

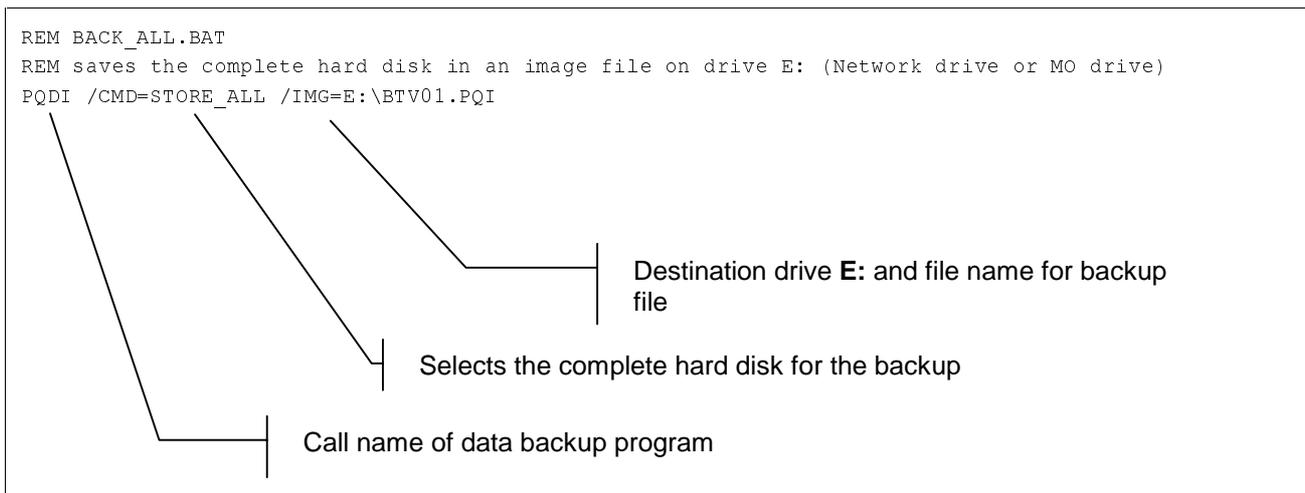


Fig. 4-19: Batch file for easy backup in an image file

⇒ Open the batch file in an ASCII editor and modify the destination drive and the file name of the backup file if necessary.

For differentiated backups it is important to create a script file. It will be executed in the batch file.

Application Example 1

Partition 3 on drive 1 as well as partitions 1 and 4 on drive 2 are to be written in the file E:\BTV20.PQI. Furthermore the image file is to be limited to 630 MB so it can be copied on a MO or on a CD.

Batch file The script file which is to be executed, the destination file for the image and the file size limit are entered in the batch file.

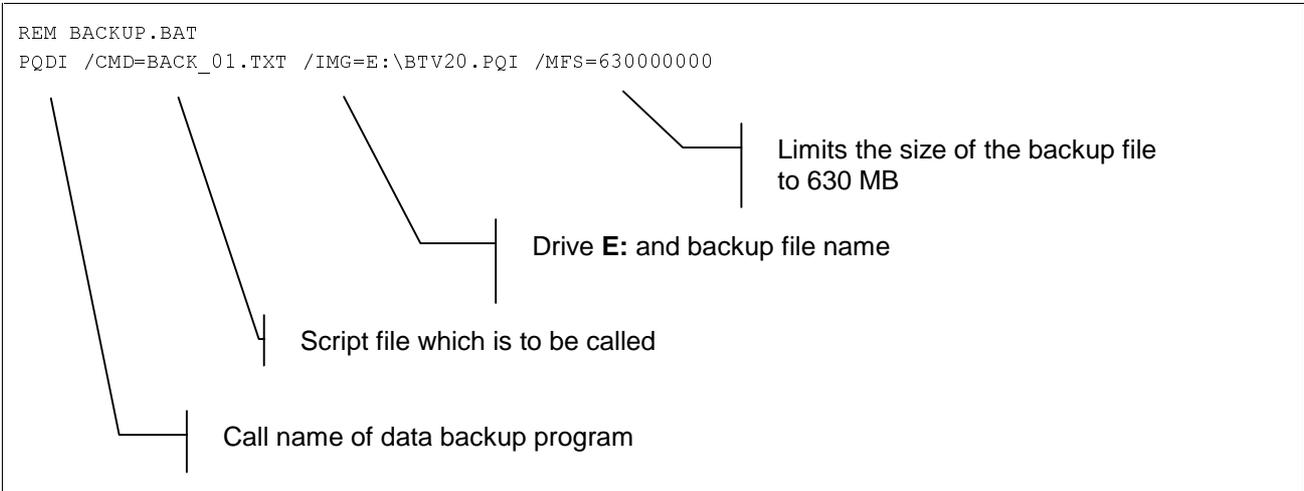


Fig. 4-20: Batch file for the backup of a partition

Script file The script file BACK_01.TXT includes the call parameters which are to be transferred to the program.

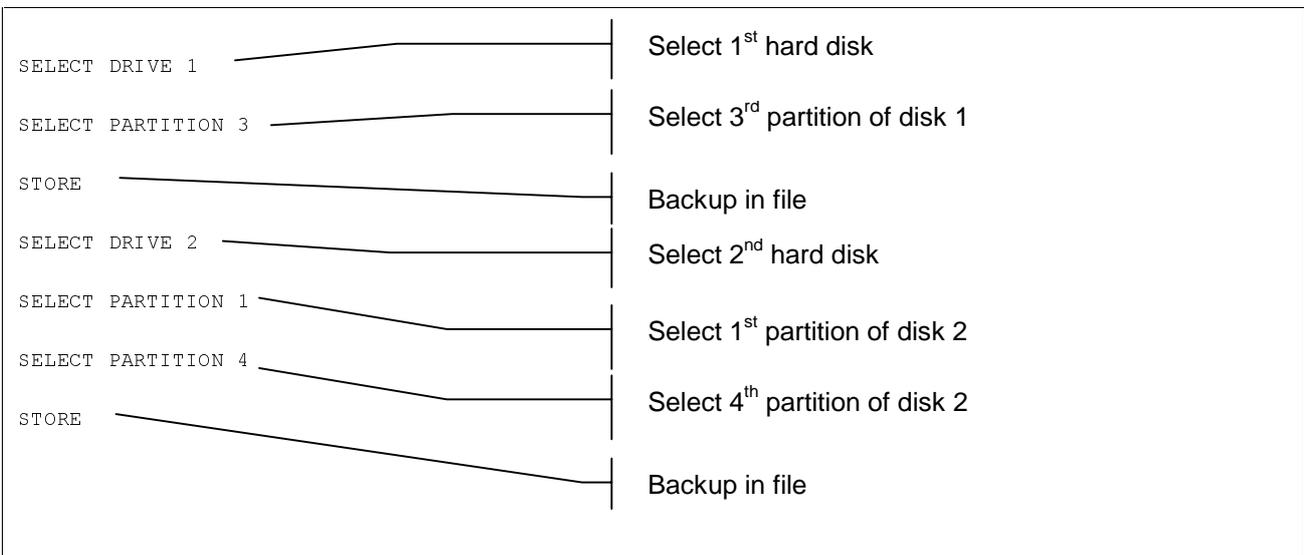


Fig. 4-21: Script file for backup

Batch File for Restoring the Data of an Image File

With the following batch file an image file can be restored easily.

```
REM REST_ALL.BAT
REM restores the complete hard disk from the image file on drive E:
PQDI /CMD=RESTORE_ALL /IMG=E:\BTV01.PQI
```

Destination drive **E:** and file name for backup file

Selects the complete hard disk for the restore

Call name of data backup program

Fig. 4-22: Batch file for easy restore of an image file

⇒ Open the batch file in an ASCII editor and modify the destination drive and the file name of the image file if necessary.

For restore details a script file can be used. This way for example the partition size can be modified or single partitions can be selected.

Application Example 2

Batch file The first two images of the file E:\BTV20.PQI are to be restored in the last free memory. The size of each image is to be limited to 500 MB: The image file is protected with the password "SECURE".

The script file (REST_01.TXT) which is to be called, the image file (BTV20.PQI) which is to be restored and the password (SECURE) for the image file are entered in the batch file.

```
REM REST_P1.BAT
REM Restore the 2nd partition of the 1st hard disk from image file on drive E:
PQDI /CMD=REST_01.TXT /IMG=E:\BTV20.PQI /PWD=SECURE
```

Password for image file

Drive **E:** and name of image file

Script file which is to be called

Call name of data backup program

Fig. 4-23: Batch file for extended restore

Script file The script file REST_01.TXT includes the call parameters which are to be transferred to the program.



Fig. 4-24: Script file for backup

Note: For further setting possibilities e. g. compressing files, please refer to the product documentation of DriveImage.

4.8 The Program HDCOPY 2.0 Pro

The program HDCOPY 2.0 Pro from HDTRONIC EDV Service GmbH is a DOS program. It is not possible to start it in the DOS window under Windows NT. Windows NT does not allow exclusive access to data mediums. For the program settings and the data backup two modes are available.

Interactive operation The software is set and operated via menu calls. The selection of the data areas to be saved and the settings of the destination drives, etc. are executed by the program in menu entries.

Batch operation For a fast automatic procedure, the program can be started in batch mode. In a batch file various parameters can be added to the call name of the program. By calling the batch file, the backup and/or restore operation can run automatically.

Setup Diskette for HDCOPY

The DOS program HDCOPY does not have to be installed. It fulfils the duty to copy the files of the original diskettes on a formatted diskette. For the data backup on a local MO drive, HDCOPY can be copied to the starting diskette. The disk space of the starting diskette for network operation is not sufficient. For HDCOPY you must insert a second diskette.

Adjust the software to your requirements by selecting program options interactively or by setting call parameters.

Set Options for Interactive Operation

The **Options** menu offers program settings for the data backup.

For example you can determine the size of the image file or select or deselect compression.

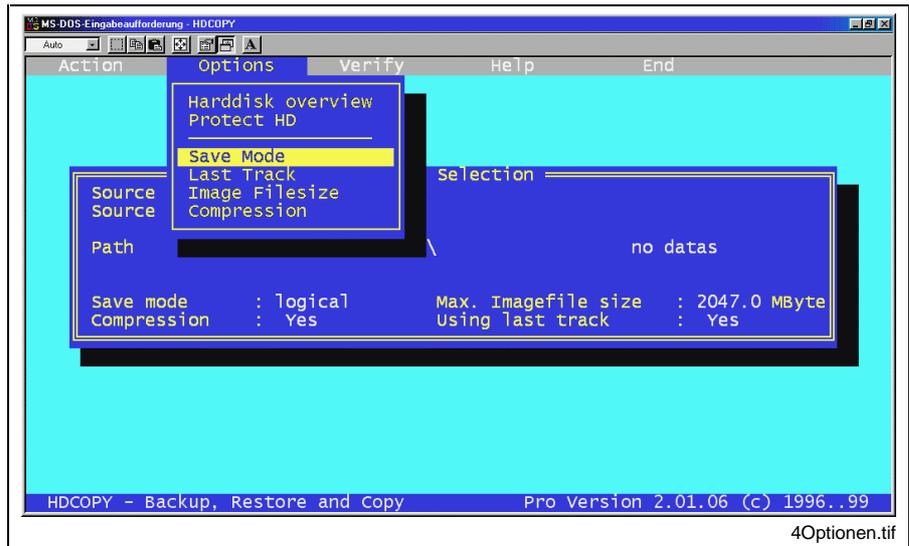


Fig. 4-25: The "Options" menu

The following options can be set.

- **Save mode**

Determines if the partitions are saved logically or physically.

- **Last track**

The use of the last track can be activated in order to have 8 MB hard disk memory available.

- **Image Filesize**

The size of the image file can be limited in order to copy the image file to a MO drive or on a CD.

- **Compression**

If compression is active, the size of the image file will be reduced to approximately 50%. This is recommended if there is not enough memory available or if the backup is to be saved on a slow medium (MO drive).

Create or Modify Batch File

With the help of a batch file, the program settings are added as parameters to the call names of the program. The batch file should have the following structure.

Batch File for Backup in an Image File

The following batch file saves all partitions of the first hard disk of the system in the BTV01.IMG file on drive E.

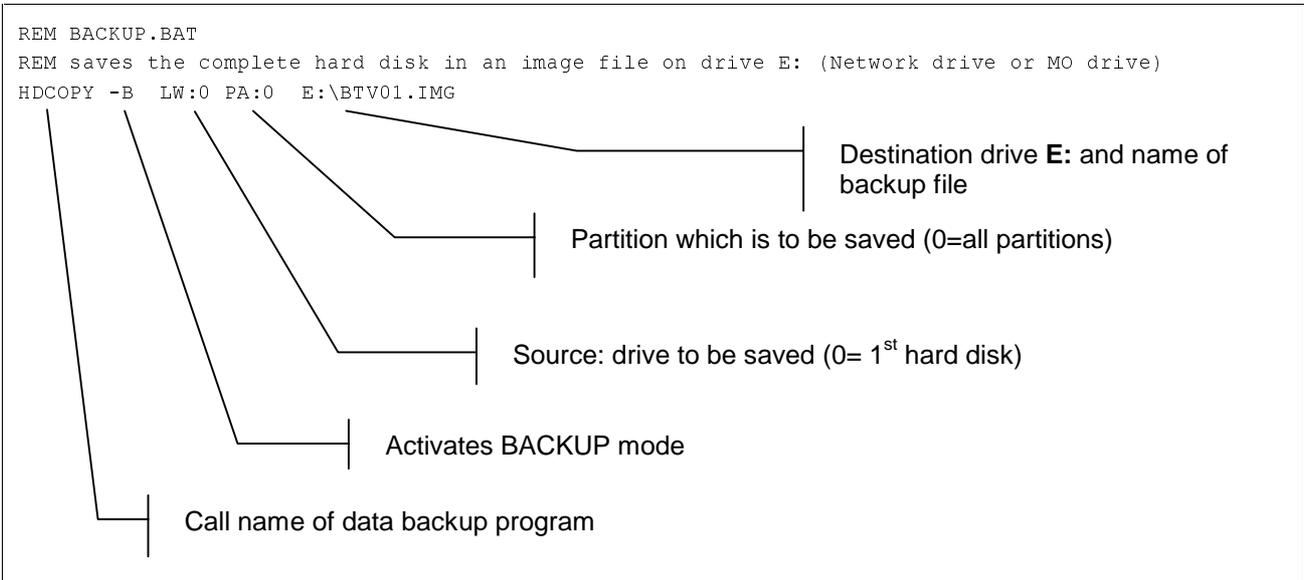


Fig. 4-26: Batch File for Backup in an Image File

⇒ Open the batch file in an ASCII editor and modify the destination drive and the file name of the backup file if necessary.

Batch File for Restoring the Data of an Image File

For the restore of an image file, a make file is necessary in addition to the batch file. This file includes information for a detailed restore in script form.

Batch file

The script file which is to be called is entered in the batch file.

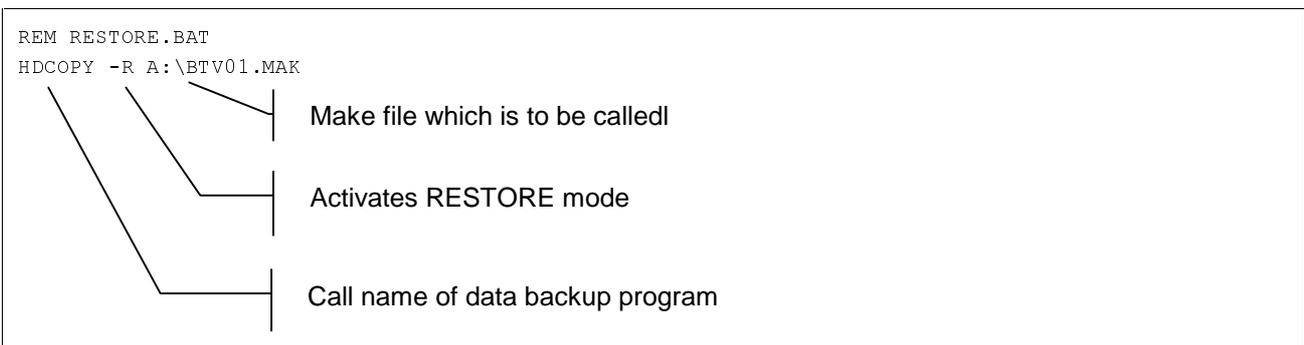


Fig. 4-27: Batch file for the restore of a partition

Make File The make file BTV01.MAK includes the call parameters which are to be transferred to the program. The first and the last line are important and must always exist.

HDCOPY Make file for restore	Compulsory: make file is recognized with this line
; Restore complete hard disk	Optional comment line, introduced by „;“
Drive=0	Selection 1 st hard disk
Keyboard=0	Keyboard inputs are not ignored
Action=L	Following selected partitions will be deleted
Number=0	0 = all partitions selected
Action=R	Restore selected
File=D:\BTV01.IMG	File for restore
Index=0	Position of partition (0 = complete restore)
HDCOPY Make End	Compulsory: end of make file

Fig. 4-28: Script file for backup

Note: For further setting possibilities e. g. modifying the partition size, please refer to the product documentation of HDCOPY.

4.9 Execute Data Backup on Local MO Drive

Requirements

- The MO drive is connected to the parallel port and is ready for operation.
- A formatted data storage medium with enough disk space is inserted in the MO drive
- A bootable diskette with device drivers and the backup program has been created

The backup is executed with assisted dialogs. This guarantees an easy handling. After selecting an option, the button Next leads to the next dialog. The button Back leads to the previous dialog. In the last dialog the archiving is started with the settings made before by pressing Execute.

Adjust batch file

Adjust the batch file BACKUP.BAT on the diskette.

- ⇒ Open the batch file in an ASCII editor
- ⇒ Enter the drive letter for the MO drive and a name for the image file to be created.
- ⇒ Save the modified file on the diskette

Execute backup

- ⇒ Shut down the system
- ⇒ Insert the diskette in the boot drive and start the computer again
The computer starts from diskette and loads the device drivers for the MO drive
- ⇒ Start the program by entering the start name at the DOS prompt and execute it interactively.

- or -

- ⇒ Call the batch file "BACKUP.BAT" at the DOS prompt
The program is loaded and started automatically. A progress-bar control on the screen displays the progress of the data backup. Depending on the program the statistics show further information about the data size, data throughput and remaining time of the backup.

When the data backup is finished, the program is exited automatically.

4.10 Execute Data Backup on Network Drive

Requirements

- You have created a bootable diskette with network client.
- A diskette with the data backup program and the batch file BACKUP.BAT is available.
- The network drive (hard disk, MO drive) where the data backup is to be executed, is available.
- The backup drive is ready (MO drive switched on) and has enough disk space.
- The modified data (NC variables, NC events, D corrections, tool lists, zero offset data, machine data, remanent SPS data, SERCOS parameter) of the control has been saved on hard disk, refer to Save Control Data on Hard Disk, page 3-6.

Adjust batch file

Adjust the batch file BACKUP.BAT on the program diskette.

- ⇒ Open the batch file in an ASCII editor
- ⇒ Enter the drive letter for the network drive and a name for the image file to be created.
- ⇒ Save the modified file on the diskette

Create network connection

- ⇒ Shut down the system
- ⇒ Insert the boot diskette in the boot drive and start the computer again

The computer starts from diskette; the drivers for the network are loaded and MS-CLIENT is started.

⇒ Confirm the question whether the network service is to be started with "Y" for Yes.

The workstation service is started.

⇒ Enter the user name and the password when prompted.

If it is started for the first time, the password must be confirmed again.

In the following screen, information about the network connection must be entered. The Tab key allows to move within the screen mask.

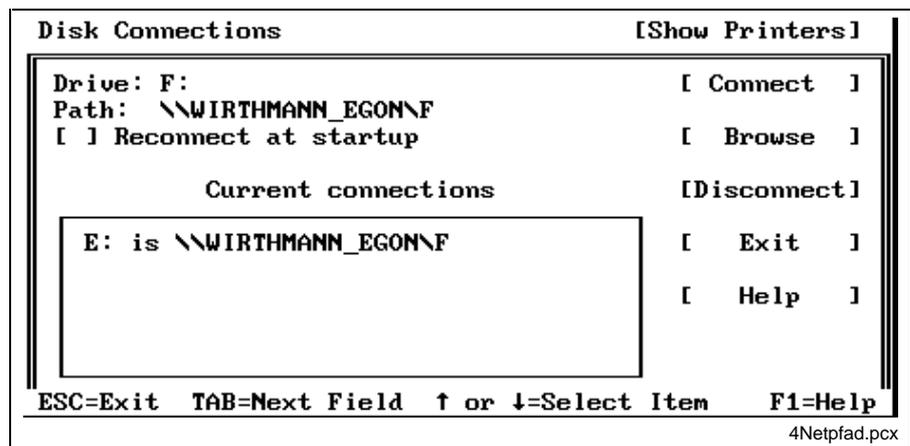


Fig. 4-29: Screen mask for network connection

⇒ Enter the path for the backup drive of the network computer (see figure above).

The path name is inserted in the list of the current connections. The letter of the drive which has been assigned to this connection is displayed in this list.

If an error message (error 53) is displayed:

The connection cannot be created, the indicated computer name cannot be found.

- Check whether the indicated path exists in the current network and whether the computer has been started
- Make sure that the path name starts with an double backslash (\\).

⇒ Mark "Reconnect at Startup" if you would like to save on the same drive every time.

⇒ Exit the screen mask with the button **Exit**

The connection to the network drive has been created now.

Execute backup

- ⇒ Insert the diskette with the data backup program
- ⇒ Start the program by entering the start name at the DOS prompt and execute it interactively.

- or -

- ⇒ Call the batch file "BACKUP.BAT" at the DOS prompt
The program is loaded and started automatically. A progress-bar control on the screen displays the progress of the data backup. Depending on the program the statistics show further information about the data size, data throughput and remaining time of the backup.

When the data backup is finished, the program is exited automatically.

Restore Data

For restoring data, the same procedure is nearly the same. The image file is re-written and the hard disk content is re-created completely. This Ghost version does not allow to restore individual data. If the hard disk entry "Autoconfiguration" was set in the BIOS, it is not necessary to log on the new hard disk in the BIOS after replacing it. The hard disk does not have to be partitioned and formatted. The partition data are saved by Ghost and re-transferred again.

Restore from Local MO Drive

- ⇒ Insert the MO disk with the image file into the MO drive
- ⇒ Boot the work station with the starting diskette for MO drive
The drivers for the MO drive are being loaded
- ⇒ Adjust the path and file names in the batch file RESTORE.BAT on the diskette if necessary
- ⇒ Start Ghost by entering "GHOST" at the DOS prompt and execute it interactively.

- or -

- ⇒ Start the restore by calling the batch file RESTORE.BAT.
The image file is restored and the hard disk data is re-created. When the restore is finished, the program is exited.

Restore from Network Drive

- ⇒ Make sure that the computer with the backup file is ready and the drive is available.
 - ⇒ Boot the work station with the start diskette for the network drive
The computer starts from diskette; the drivers for the network are loaded and MS-CLIENT is started.
 - ⇒ Confirm the question whether the network service is to be started with "Y" for Yes.
The workstation service is started.
 - ⇒ Enter the user name and the password when prompted.
 - ⇒ Enter the path of the backup drive on the network computer in the following screen. The path name is inserted in the list of the current connections. The letter of the drive which has been assigned to this connection is displayed in this list.
 - ⇒ Finish the dialog with the button **Finish**
 - ⇒ Adjust the path and file names in the batch file RESTORE.BAT on the diskette
 - ⇒ Start the program at the DOS prompt and execute it interactively
- or -**
- ⇒ Start the restore by calling the batch file RESTORE.BAT.
The image file is restored and the hard disk data is re-created. When the restore is finished, the program is exited.

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