



Transferring data from a PDP-11 to CHARON-11 using Dump and UNDUMP over a serial line.

This application note describes how to create a CHARON-11 disk image from a real PDP11 disk. Any disk type supported by CHARON-11 is suitable for this procedure.

1. Hardware and software required:

- A PDP11 with a serial line
- A magnetic tape device connected to the PDP11 is required when creating a bootable disk image.
- The PDP-11 operation system that must be configured for work with the serial line, and the magnetic tape device if required.
- A PC computer with CHARON-11 PDP11 emulator installed.
- The PC must also have a software tool supporting serial lines. This software has to save information coming from the serial port to an ASCII file. For example PATHWORKS PowerTerm 525 terminal emulator is appropriate for this purpose. This is the example referred to below.
- A connection between a PDP11 serial port and any of COM ports of the PC.

2. Before starting:

- Establish an connection between PDP11 and PC using appropriate serial cable
- and if working with bootable disks
- Insert a clear magnetic tape to magnetic type device.
- Make sure that magnetic tape device is ready to work

3. Non-bootable disks

This chapter describes how to create CHARON-11 disk images for non-bootable disks.

On the PDP11:

If the non-bootable disk is mounted dismount it by issuing the command:

>DMO <disk name>:

For example:

>DMO DU1:

You can check a current status of the disk by the command:

>DEV <disk name>:

For Example:

>DEV DU1:

Mount the disk as foreign:

>MOUNT <disk name>: /FOR

For Example:

>MOUNT DU1: /FOR

If the DMP utility is not installed install it by the command:

>INS \$DMP

On the PC:

Start the terminal software and configure it to working with the COM port connected to the PDP11 serial line. Before proceeding to the next step test that your chosen device is able to interpret correctly any characters sent to the serial line by the PDP-11. For example direct a copy command to the serial line on the PDP-11 and check that the characters are received on the remote system.

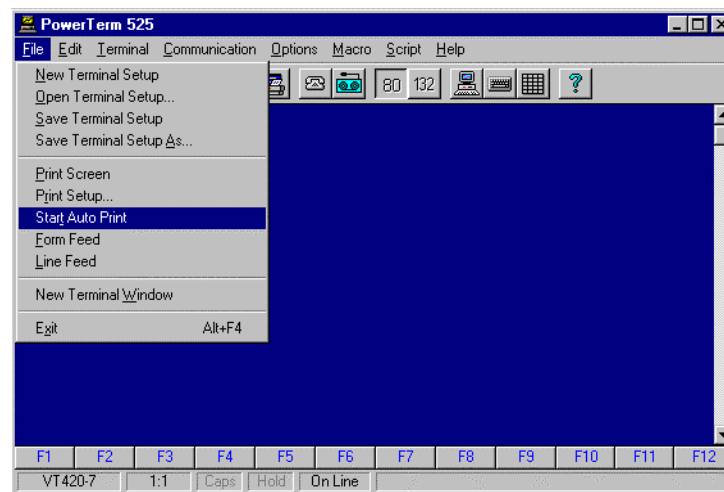
For Example (For COM1 port):

Start → Programs → PATHWORKS PowerTerm 525 → PowerTerm COM1

In the “PowerTerm COM1” application: Click on the **“Terminal Setup”** button, choose **“Printer”** area, set **“Print Device: file”**. In the section **“Device”** enter a file name to store the dump information (for instance: **“c:\du1.dmp”**) and set the **“File creation”** switch to **“overwrite”** position. (see the picture)



Then choose “File” from application menu and choose “Start auto print” option. PowerTerm starts to print all information from the COM1 port to the file C:\du1.dmp in ASCII format.



On PDP11:

e) Start the disk dump by issuing the command:
>DMP <serial port name>: = <disk name>: /BL:0

For example (for TT1 serial line)

:>DMP TT1: = DU1: /BL:0

You should see ASCII dump information is displayed in the Term application window. This step may take many hours or even days to finish according to the disk size and speed of serial connection between PDP and PC.

On the PC:

When the previous step finishes stop the dumping to the file.

For example:

- Choose "File" on the PowerTerm application menu
- Choose the "Stop auto print" option.

Open an DOS prompt and invoke the UNDUMP utility with the dump file as a parameter:

>undump -d <disk type> -m <dump_type> <dump file> <disk image file>

For example:

>undump -d RZ74 -m 4 C:\du1.dmp C:\du1.dsk

This command creates a CHARON-11 image of a RZ74 disk from the RSX octal dump file.

You can get all the information about supported disk types and dump types just by typing "undump" without any parameter. Or by referring to the chapter on UNDUMP below.

To configure CHARON-11 to use this particular disk image refer to the configuration file fragment shown below.

load UDA50 DU0

set DU0 file[0]="C:\du0_sys.dsk"

set DU0 file[1]="C:\du1.dsk"

4. Bootable disks

This chapter describes how to create CHARON-11 disk images for non-bootable disks.

On the PDP11:

Insert the tape into the magnetic tape device and make sure that MTD is ready to operate.

If the BRU utility isn't installed install it by the command:

>INS \$BRU

If the DMP utility isn't installed install it by the command:

>INS \$DMP

Allocate and mount the tape as foreign:

>ALLOCATE <tape device>:

>MOUNT <tape device>: /FOR

For example:

>ALLOCATE MU0:>MOUNT MU0: /FOR

Backup the system disk to the tape using BRU utility:

>BRU /REW/MOUNT <system disk>: <tape device>:

For example:

>BRU /REW/MOUNT DU0: MU0:

Dismount the tape by issuing the following command:

>DMO <tape device>:

For Example:

>DMO MU0:

Mount the tape as foreign:

>MOUNT <tape device>: /FOR

For Example:

>MOUNT MU0: /FOR

On the PC:

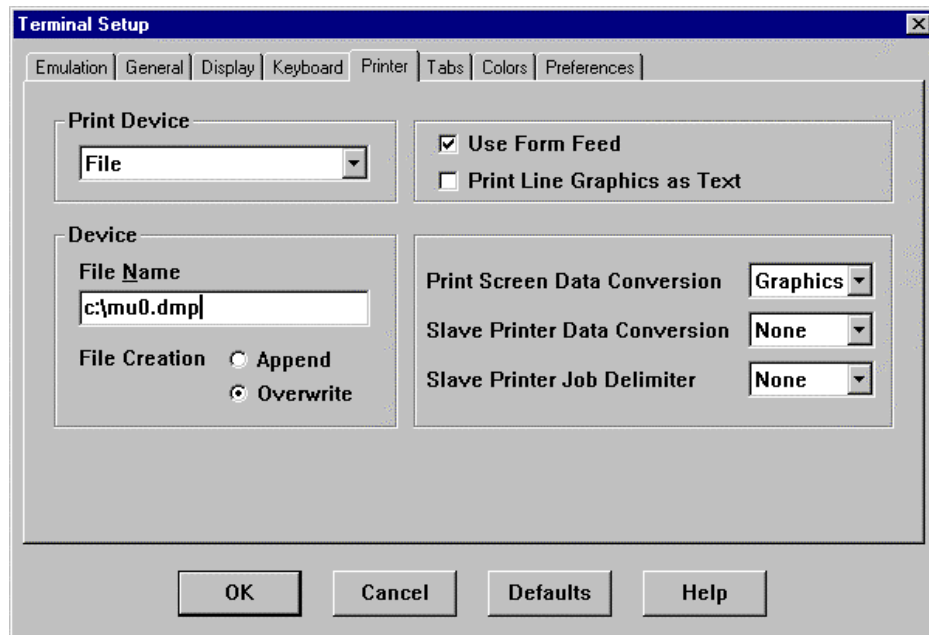
Start the terminal software and configure it to working with the COM port connected to the PDP11 serial line.

For Example (For COM1 port):

Start → Programs → PATHWORKS PowerTerm 525 → PowerTerm COM1

In the “PowerTerm COM1” application:

Click on the “**Terminal Setup**” button, choose “**Printer**” area, set “**Print Device: file**”. In the section “**Device**” enter a file name to store the dump information (for instance: “**c:\mu0.dmp**”) and set the “**File creation**” switch to the “**overwrite**” position. (see the picture)



Then choose “File” from the application menu and choose the “Start auto print” option. PowerTerm starts to print all the information from the COM1 port to file C:\mu0.dmp in ASCII format (see 1-d)

On the PDP11:

Start the disk dump by issuing the command:

>DMP <serial port name>: = <tape device>: /BL:0

For example (for TT1 serial line):

>DMP TT1: = MU0: /BL:0

You will see the ASCII dump information displayed in the PowerTerm application window. This step may take many hours or even days to finish according to the size of the backup and the performance of the PDP-11 and the PC.

On the PC:

When the dump is finished close the dump file.

For example:

- Choose “File” from the PowerTerm application menu
- Choose the “Stop auto print” option.

Open the MS-DOS prompt and invoke the UNDUMP utility with the dump file as a parameter:

>undump -t <dump file> <tape image file>

For example:

>undump -t C:\du0.dmp C:\du0.img

This creates a CHARON-11 image of a tape from the RSX11 octal dump file.

Create a disk image of the required type by using mkdisk utility:

>mkdisk -t <disk_type> <file_name> or >mkdisk -s <size in blocks> [-b <block size>] <file_name>

For Example:

>mkdisk -t RZ74 c:\du0.dsk

See the chapter on mkdisk for more details.

To configure CHARON-11 to use this tape and disk images refer to the configuration file fragments shown below.

```
load TMSCP MU0
set MU0 file[0]="image mu0.img"
```

```
load UDA50 DU0
set DU0 file[0]="C:\du0_sys.dsk"
set DU0 file[1]="C:\du0.dsk"
```

```
boot DU0 0
```

In the example above we assume that C:\du0_sys.dsk is a bootable system that already exists

In the PDP-11 emulated by CHARON-11:

Initialize and format the disk image created above.

For Example:

```
>ALLOCATE DU1:
>MOUNT DU1: /FOR
>FMT DU1:
```

The format instruction is optional, depending on disk type. For more details see the chapter on Disk emulation.

Restore the backup tape image on non-bootable Charon disk using BRU utility:

If BRU is not installed install BRU by issuing the following command:

```
>INS $BRU

>BRU /INIT <charon tape device with the tape image>: <Not-bootable Charon disk>:
```

For Example:

```
>BRU /INIT MU0: DU1:
```

This BRU creates a bootable disk image on DU1:. The host operating system file in our example is as allocated in the configuration file, namely C:\du0.dsk

5. The UNDUMP utility

1.1 The Dump Utility UNDUMP

The *undump* utility is a simple program which restores the original disk image from its ASCII dump file. When *undump* processes a dump file, it converts ASCII lines of dump output back into the original byte pattern. In case of errors (e.g. a corrupted ASCII dump file), a non-convertable line (except blank lines or lines with logical sector information) is written into the report file named "undump.lst".

undump -d <disk type> -m <dump type> [-f] source destination

where:

source specifies source file containing disk dump.
destination specifies destination file containing resulting disk image. If the destination file already exists, the **undump** utility overwrites it.
dump type specifies dump type. The following dump types are supported:

| dump type | Comment |
|-----------|---|
| 1 | UNIX dump (short words as octal values) |
| 2 | VMS dump (octal) |
| 3 | VMS dump (hexadecimal) |
| 4 | RSX dump (octal) |
| 5 | RT dump (hexadecimal) |
| 6 | VMS dump (long word hexadecimal) |

-f This parameter is optional. *-f* filters the source data and transforms it to a disk image in binary form dropping the input end of line symbols. The generated disk image file will have exactly the size

defined by the input data. -f suppresses error reporting. -f expects input in hexadecimal format in four columns, that is dump type 3 or 5.

disk type specifies type of the disk to be dumped. This parameter can be chosen from the following list:

Examples:

>undump -d rd53 -m 4 rd53.dmp rd53.dsk

Converts an RSX11 octal dump of an RD53 disk into a disk container.

>undump -d rd54 -m 5 -f rd54.dmp rd54.dsk

Converts an RT11 hexadecimal dump of an RD54 disk into a disk container.

| | |
|-------|-----------------------------------|
| Rk05 | DEC RK05 cartridge disk drive |
| Rk06 | DEC RK06 cartridge disk drive |
| Rk07 | DEC RK07 cartridge disk drive |
| RI01 | DEC RL01 cartridge disk drive |
| RI02 | DEC RL02 cartridge disk drive |
| Rd50 | DEC RD50 disk drive |
| Rx01 | DEC RX11 floppy |
| Rx02 | DEC RX21 floppy |
| Rx50 | DEC RX50 floppy |
| Rm02 | DEC RM02 disk drive |
| Rm03 | DEC RM03 disk drive |
| rm05 | DEC RM05 disk drive |
| rm80 | DEC RM80 disk drive |
| rp04 | DEC RP04 disk drive |
| rp05 | DEC RP05 disk drive |
| rp06 | DEC RP06 disk drive |
| rp07 | DEC RP07 disk drive |
| rz22 | DEC RZ22 Winchester 5.2 MB 3.5" |
| rz23 | DEC RZ23 Winchester 104 MB 3.5" |
| rz23l | DEC RZ23L Winchester 121 MB 3.5" |
| rz24 | DEC RZ24 Winchester 209 MB 3.5" |
| rz24l | DEC RZ24L Winchester 245 MB 3.5" |
| rz25 | DEC RZ25 Winchester 425 MB 2.5" |
| rz26 | DEC RZ26 Winchester 1.5 GB 3.5" |
| rz27 | DEC RZ27 Winchester 1.6 GB 3.5" |
| rz28 | DEC RZ28 Winchester 2.1 GB 3.5" |
| rz29 | DEC RZ29 Winchester 4.3 GB 3.5" |
| rz74 | DEC RZ74 Winchester 3.75 GB 5.25" |

| | |
|------|-----------------------------------|
| rz35 | DEC RZ35 Winchester 825 MB 3.5" |
| rz55 | DEC RZ55 Winchester 332 MB 5.25" |
| rz56 | DEC RZ56 Winchester 665 MB 5.25" |
| rz57 | DEC RZ57 Winchester 1.0 GB 5.25" |
| rz58 | DEC RZ58 Winchester 1.38 GB 5.25" |
| rz59 | DEC RZ59 Winchester |
| rz73 | DEC RZ73 Winchester 2 GB 5.25" |
| ez51 | DEC EZ51 100 MB Solid State Disk |
| ez54 | DEC EZ54 400 MB Solid State Disk |
| ez58 | DEC EZ58 Winchester 1 GB 5.25" |
| rx23 | DEC RX23 1.4 MB 3.5" |
| rx26 | DEC RX26 2.8 MB 3.5" |
| rx33 | DEC RX33 1200 KB 5.25" |
| rc25 | DEC RC25 Removable |
| rx50 | DEC RX50 5.25" |
| rd51 | DEC RD51 10 MB 5.25" |
| rd52 | DEC RD52 31 MB 5.25" |
| rd53 | DEC RD53 71 MB 5.25" |
| rd54 | DEC RD53 159 MB 5.25" |
| ra60 | DEC RA60 Removable |
| ra70 | DEC RA70 Winchester |
| ra71 | DEC RA71 Winchester 700 MB 5.25" |
| ra72 | DEC RA72 Winchester 1.0GB 5.25" |
| ra73 | DEC RA73 Winchester 2.0GB 5.25" |
| ra80 | DEC RA80 Winchester |
| ra81 | DEC RA81 Winchester |
| ra82 | DEC RA82 Winchester |
| ra90 | DEC RA90 Winchester |
| ra92 | DEC RA92 Winchester |

The following dump types are supported:

UNIX dump (short words as octal values)

VMS dump (octal), VMS dump (hexadecimal)

RSX dump (octal), RT dump (hexadecimal)

The utility is available for the following operating systems: Windows 95, Windows NT, Windows 98, True64 UNIX.