

Recovery Card

User's and Reference Manual

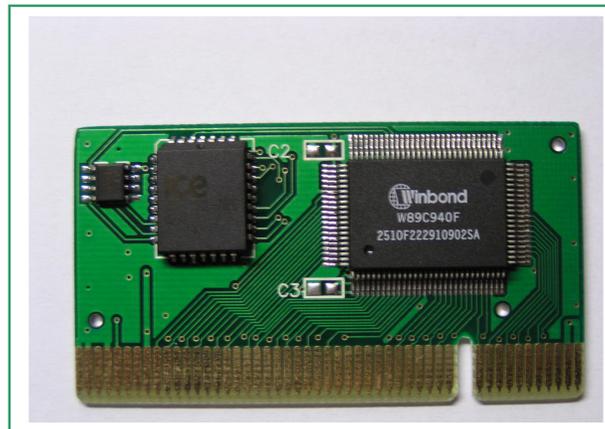


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1. Who needs the Recovery Fast Recovery card?

Computer room managers will be familiar with problems like mis-operation or incorrect shutdown by users, illegal operations from Windows itself, viruses, and sometimes loss of data or files as a result of curiosity or even willingly damaging the software by the users. The Recovery Fast Recovery card can repair the computer system by simply rebooting the computer. The Recovery card can be instructed to automatically restore the system on a flexible regular time interval, or on every reboot.

All that has to be done is installing the Recovery card in the computer and specifying the data that has to be protected, and the data will be kept good forever. Not only the supervisor has an easier task because he does not have to restore the computers after misuse, he can even give the users more freedom because even if they format the hard disk, the Recovery card will restore the data after the computer has been rebooted. In case of a teaching environment students can learn how to operate for example a word processor, thereby modifying and saving files, and after a restart of the computer all the files used are fresh again for the next session.

Computer room management is also made easy when the computers are connected in a network. The Recovery card can co-operate with a network card to synchronize with another computer, this making management of a computer room as easy as management of a single computer.

Note: the Recovery card, of course, cannot protect the computer from hardware failure. It is therefore strongly advised to keep a back up of your important data at all time.

2. Main features of the Recovery card

- PCI Bus plug-and-play without any changes to the hard disk, the installation uses as little as 0.5% of the available hard disk space -which is negligible with today's hard disk sizes.
- Recovers data instantaneously, as it simply forgets all the changes made.
- Wide compatibility support for Windows 95, 98, ME, NT, 2000 and XP, and support for the BIGDOS, FAT16, FAT32 and NTFS file systems.
- Support for BIOS protection and recovery of hard disk parameters and type.
- The Recovery card has a built-in VxD device driver of Windows 95, 98 and ME, therefore it does not need a floppy disk during installation and usage. On Windows NT, 2000 and XP a driver has to be installed.
- Support for automatic maintenance of all computers in a networked computer room. Maintaining a computer room is now just like maintaining a single computer. The Recovery card supports synchronization, remote on/off switching and automatic setting of IP address, computer name and user name.
- Support for third party multi-boot software like System Commander or LILO.
- Support for multiple partition protection. If the hard disk is divided into multiple partitions, the Recovery card can protect all or any of the partitions. For example if the hard disk is divided in partitions C, D and E, protection can be switched on for drives C and E leaving drive D unprotected. Of course any combination of protected and unprotected drives is allowed.
- Support for high-speed access modes such as Ultra-DMA66 and ATA-100.
- Support for large hard disks with a capacity of over 100 GB.
- Support for hard disks with IDE, EIDE and SCSI interfaces.
- Preventing virus infection and destruction of protected drives, and can disable disk management tools and low-level formatting tools.
- Three-click fast installation options.
- No hard disk performance loss.

3 Quick startup

The fast installation option is for computers with Windows 95, 98 or ME installed; Windows NT, 2000 and XP need installation of a software driver, this is the file setup.exe on the driver (some branded name computers the driver must be installed before the Recovery card, else a blue screen will popup during booting of your PC). The installation can be done as easy as inserting the card into the computer, switching on the computer, and pressing the <ENTER> key three times as soon as the installation interface of the Recovery Fast Restore card appears. It is strongly recommended though to change the default password (the default password is empty, that means you only have to press <ENTER> when the password is asked), and it is recommended to check the other installation options.

After installation the Recovery card shows a menu on the screen when the computer is started, this menu appears before the operating system is started. The choices provided are to continue in either "Protected Mode" or "Open Mode", or to change the "Configuration" of the Recovery card, or "Save Changes to Hard Disk".

- "Protected Mode" is the working mode, which protects data on a specified area of the hard disk such as C:\ Drive (where the main Operating System is). Users can modify the data normally, but the Recovery card can always restore the original data after a manual reboots or resets.
- "Open Mode" is the working mode, which does not protect any data, this is useful for system installation and administration. The Recovery card protection features are switched off in this mode. **WARNING: SWITCHING TO "OPEN MODE" IMPLIES A RESTORE TO THE LATEST SAVED STATE!** If you made changes you want to keep when switching to open mode, select the "Save Changes" option first.
- "Configuration" is to set some working parameters of the Recovery card, like the password you want to use, the partition or partitions of the hard disk to protect, and how and when to restore the original data.
- "Save Changes" makes all the changes made to files on the hard disk in protected mode permanent. The current state of the hard disk becomes the new saved state. This is useful after installation of new software, or when changes to the system settings were made.

3.1 How it works

When the user changes a file, or saves a file, or anything the Recovery card appears to save the file to disk normally, the file can later be accessed as if nothing special has ever happened. This is of course not the case. The file is saved on the hard disk, but the Recovery card remembers where the changes are stored, as shown in figure 1 below:

File X1	File X2	Other data stored in your HDD	Changes in File X1
---------	---------	----------------------------------	-----------------------

Figure 1: schematic representation of the data on the hard disk.

If File X1 is modified under Protected Mode, the Recovery card keeps File X1 unchanged and saves the changes in a copy of File X1. If now File X2 is accessed, everything goes normal. However when file X1 is accessed the Recovery card presents the modified copy. File X1 appears to be modified, but the original one is merely hidden and remains untouched.

Actually the Recovery card only creates a copy of the modified part of the data. For example, if 5% of the content of file X1 is modified, then the Recovery card only creates a copy of that modified 5%. For this copy the empty space of the hard disk is used.

4 Preparations you need before installation

The Desktop PC system requirements are

- An IBM compatible PC with a 486 or higher CPU.
- IDE, EIDE or SCSI hard disk.
- VGA graphics.
- One empty PCI slot.
- For the network maintenance option a Network Card is required.

Check the hardware and software of the computer to see if they are in good working condition

- Check the BIOS to ensure the hard disk parameters are correct. The Recovery card only supports the first physical hard disk.
- Set the virus-check option in the BIOS to Disabled.
- If the BIOS knows a "LAN SETUP FIRST" or similar option, set this option to Enabled.
- A thorough virus check is recommended to make sure there is no virus in the computer at the time of installation of the Recovery card. You can use your own favorite updated virus scanner.
- It is recommended to do a hard disk defragmentation prior to the installation of the Recovery card. The default disk defragmentation program of Windows does the job well. This is to keep your hard disk data in a good and efficient condition.
- It is recommended to store the Virtual Memory (swap file) on an unprotected partition of the hard disk via Start > Control Panel > System > Virtual Memory > Set Virtual Memory Specified.
- It is recommended to store the Temporary Internet Files on an unprotected partition of the hard disk via Start > Control Panel > Internet Options > Temporary Internet Files > Settings > Move folder.

It is recommended to disable real-time virus monitoring software and system recovery software such as "Norton Ghost".

5 Installation of the Recovery card into the PC

Unplug all power cables prior to performing this operation, and beware of static electricity as it can damage both the Recovery card and the rest of your PC hardware. If you do not know how to do this, ask an expert for advice.

Power down your PC and open the cover of the computer to insert the Recovery card into an empty PCI slot, and ensure that it is inserted correctly in the slot. Close the computer cover, and connect all unplug power cables.

Power up you PC, after the power-on self-test, the initial installing interface of the Recovery Fast Recovery card should appear Figure 2:

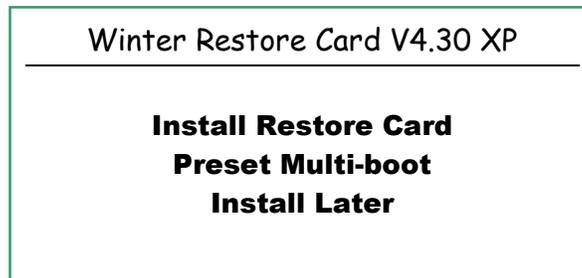


Figure 2: The installation interface.

Select **Install Now** to enter the system menu to execute a normal plug and play installation. If this interface does not appear, and maybe a blue screen will show up, then either case, the card is not inserted properly, or likely you need to install the driver first prior to installing the Recovery card.

After pressing <ENTER> the system configuration menu will appear Figure 3:

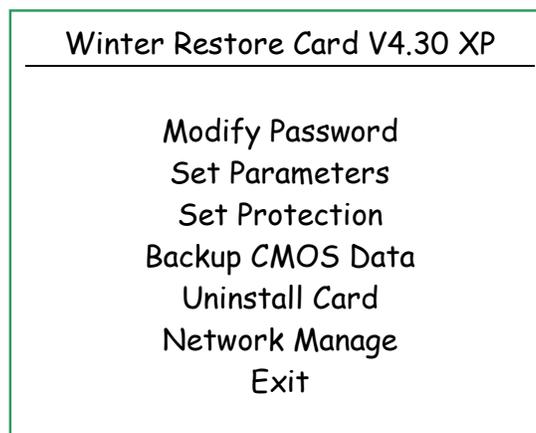


Figure 3: the configuration menu.

In this menu, the "Configuration menu", several options can be set, please refer to chapter 7 for an overview. To complete the installation, select [Exit](#). The Recovery card will ask for confirmation, when confirmed the card is completely installed.

6 The Daily operation

When starting up, the Recovery card shows the following startup menu:

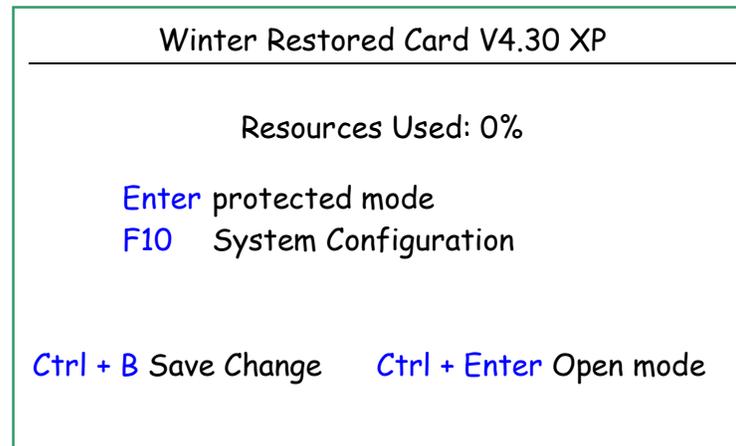


Figure 4: the startup menu.

- **ENTER** Protected Mode. This is the normal working mode for a public computer, there is no special action necessary for this mode. The Recovery card now protects the specified parts of the hard disk. All file operations including deleting files and formatting the disk appear to work normally, but all data can be instantly restored by restarting the computer.
- **F10** System Configuration. Enters the configuration menu, see chapter 7.
- **Ctrl + B** Restore data. Restores the data on the hard disk to the latest savedstate.
Note: this option is only visible when in the options menu the "Recovery Mode" is set to Keep.
- **Ctrl + Enter** Open Mode. This is not a recovery mode, and does not change the original recovery settings. Now all data written to the disk will truly be written to the disk. This is useful for the system administrator to make changes to the system, e.g. install or remove programs. This mode is valid until the next reboot. The password is required to enter this mode.

WARNING: ENTERING OPEN MODE MEANS AUTOMATICALLY A RESTORE TO THE LATEST SAVED STATE!

7 The Configuration menu

This chapter explains the options in the configuration menu, as shown in Figure 3 above. To navigate this menu, use the cursor keys to highlight the option to change, and press <ENTER>.

7.1 Set Protection

By default, only drive C is protected. The Recovery card supports up to eight partitions and one physical hard disk. If more than one hard disk is installed in the system the Recovery card will only be able to protect the first physical hard disk.

On entering the **Set Protection** menu the following screen will appear Figure 5:

Set Protection				
Partition	Filesystem	Size(MB)	Free(MB)	Protected
C:	NTFS	10001	9121	[Y]
D:	FAT32	16072	10569	[N]
E:	FAT32	16072	10569	[N]

Esc Exit +/-/PgUp/PgDn/Space Modify

Figure 5: the 'set protection' menu.

Use the cursor keys to select the partition, and then the +/-/PgUp/PgDn keys to change the status of the partition. Press <ESC> when finished.

Figure 7: prompt to restore data.

-If the space bar is pressed now, the Recovery card restores the data to the last saved state. Any other key pressed will make the computer continue booting with the current state of the hard disk.

- Keep: the data is not recovered automatically, only the administrator can recover the data by pressing the <F4> key during startup.

- **Automatic recovery**

- Each reboot: The protected data of the hard disk will be restored automatically each time the computer is rebooted.

- Every half-day/ day/ 7 days/ 15 days/ 30 days: the Recovery card will restore the data on the disk automatically in the set frequency.

- **CMOS data recovery.**

When this option is set to Enabled, the Recovery card will check the BIOS with the saved state on every boot. When it finds the BIOS data has changed, it will prompt to restore the BIOS data. To keep the current settings, press <CTRL>-<HOME>, and enter the first four letters of the password when prompted.

7.3 Modify Password

The default password of the Recovery card is empty, that means only pressing the <ENTER> key when the password is prompted. To change the password select the **modify password** option, enter the old password, and then enter the new password twice.

7.4 Backup CMOS data

To analyze the contents of the BIOS, the Recovery card has to reboot the computer three times. When the **backup CMOS data** option is selected, the Recovery card will ask if you really want to do this, and when confirmed by pressing the <Y> key it will reboot the computer three times. When done, the message "CMOS has been backup" will appear.

7.5 Uninstall Recovery card

The Recovery card can be safely uninstalled, this will not harm any of your protected data. Uninstalling the Recovery card implies that the data on the hard disk will be restored to the latest saved state, select **save changes** if you want to save your latest changes. To complete the un-installation, the software driver has to be removed from the computer.

- Windows 95, 98 and ME:

Go to the directory C:\WINDOWS\SYSTEM\IOSUBSYS, and remove the file HDMCVSD.VXD.

- Windows NT, 2000 and XP: open the Control Panel (Start>Settings>Control Panel or Start>Control Panel) and choose the icon Add/Remove Programs. Remove the driver software.

8 Networking

The Recovery card can do remote maintenance and synchronization of a complete networked computer room in co-operation with a network card in the computer.

After initial installation of the capability on the computers, all these computers can be synchronized easily. Changes are made to one computer (the sender) and when the configuration is complete the NetCopy tool can synchronize all other computers (the receivers) in the network. Maintenance of a computer room with a few dozens of computers is now brought down to the maintenance of a single computer.

8.1 Preparing network synchronization

After synchronizing the networked computers using a broadcast, all data on the hard disk, the BIOS data, and the settings of the Recovery card will be the same. Therefore, it is recommended to make sure the set-up of the sender is correct before performing this operation. Note: this will only work when all computers in the network are identical! So the same brand, same components, etc. The tool is not suitable for synchronizing a network with a mix of brands and types of computers.

8.1.1 Installation of the network adapter

Every network card comes with a so-called 'packet driver', you will have to use the packet driver of your network card, as provided by the manufacturer of the network adapter. Rename this packet driver to NCPACKET.COM, and copy this file to the same directory as where you have installed NETCOPY.COM - This should be the root directory of the first partition of your hard disk (usually drive C:). The sample NCPACKET.COM as provided on the tool disk is the driver for the Realtech RTL8139 chipset. Do this for all computers, the sender and the receivers alike.

To use the NETCOPY.COM tool, you have to first make sure the Recovery card is installed properly. When starting the computer, switch the Recovery card to 'open mode'. Run the computer in DOS mode, and make sure the DOS programs HMEM.SYS and EMM386.EXE are loaded. Then run NCPACKET.COM to install the network adapter, the computer is now ready for the synchronization as described below.

8.1.2 Preparing the sender

In order to automatically assign and modify the network identity parameters of each receiver, set the computer name, user name and IP address (if required) of the sender, execute `NETCOPY.COM` from the tool disk, and press <F10>. A broadcast is sent out to all computers in the network, the identity of each receiver will be the identity of the sender plus the network node number plus one. The same accounts for the assigned IP address. For example, the sender's name is PC5 and its IP address is 192.168.10.1. Now the computer on node 26 will be called PC32 ($5+26+1=32$), and its IP address will become 192.168.10.28 ($1+26+1=28$).

8.1.3 Preparing the receiver(s)

Start the computer in DOS mode, with `HIMEM.SYS` and `EMM386.EXE` loaded as described above. Run `NCPACKET.COM` and then `NETCOPY.COM`, the computer will automatically go into receiver mode.

8.1.4 Synchronization

The receivers will automatically log in to the sender, as soon as the sender is detected. Now press <F2> on the receiver to start the synchronization process. The computer will now be synchronized to the sender; the time this takes depends on the speed of the network, the speed of the hardware and the amount of data to be transmitted.

9 Troubleshooting

The Recovery card is not found by the computer, and thus it seems that no card is present.

A: Then the card is probably not properly inserted in the slot, or there is a conflict with other hardware. Follow the following steps:

- Make sure the Recovery card is inserted properly. If so, take out the Recovery card and reinsert it, or insert it in another PCI slot.
- When there are other cards with a CMOS ROM installed in the computer, there may be a conflict. Try to adjust the ROM address of the other card.
- Make sure the "virus warning" option in the BIOS of the computer is set to Disabled.

In Windows 95/98, an exclamation mark appears on hard disk controller after installing the Recovery card; the system halts or shows a blue screen saying, "can not load HDMC driver" during startup.

A: This problem usually has one of the following two causes:

- The BIOS settings are incorrect. In the BIOS, go to the "PnP/PCI Configuration" menu and set "Reset" to "Enabled" or "Both". Some computers also have a problem with the "PnP OS Installed" option. Try adjusting this option.
- The built-in VxD driver of the Recovery card does not run normally, or is enforced to run in 16-bit mode. This can be solved as follows:
 - A special IDE driver which is not compatible with the Recovery card was installed in Windows 95/98. If a special IDE driver was installed, try to uninstall it and restore the standard driver. Please refer to the manual of your IDE driver how to do this.
 - Another Recovery card was installed on this computer previously. Uninstall the old driver with the software from that old card, and reinstall the new Recovery card.

Data on hard disk cannot be protected under Windows NT, 2000 or XP.

A: This means the NT/2000/XP driver of the Recovery card does not run properly. Make sure the driver is installed, and that it is the correct version for your Recovery card. If the driver is not installed, or cannot be loaded, the computer will prompt "can not load" and you will hear a low-high-low-high beep sound. In this case, run SETUP from the driver disk again, check your version number, and install the driver again.

Forgot the password after installing the Recovery card.

A: The password can be reset using the CLEAR.EXE program. This goes as follows:

- Remove the Recovery card from the computer. THIS MAY CAUSE A RESET TO YOUR LATEST SAVED STATE!
- Reboot the computer in DOS mode, or start up with a DOS boot disk, and run the program CLEAR.EXE from the driver CD. When the bleu screen appears press <F10> to continue.
- Re-install the Recovery card, now the password is empty.

After removing the Recovery card from the system, Windows NT, 2000 or XP gives an alarm.

A: This is because the driver of the Recovery card has not yet been uninstalled. Uninstall the driver from the control panel.

A blue Screen shows up in the middle of the Startup of Windows 2000 and the blue screen hanged, and nothing works unless you pull the power plug.

A: This can happen to some branded name PCs running Windows 2000, take out the card and let the Windows 2000 boot up normally, install the driver, and power down the PC. Install the card back, and power up the PC. This should work.

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