Sending/Receiving files

The floppy disk drive on the Notebook is probably the easiest way of transferring documents and worksheets to and from another computer. Just copy a file to a disk, insert it into the other computer and you can then read in the information. However, some computers do not use the same type or format of disks as used on the Notebook and IBM PCs. In this case you can still transfer data to and from the other computer by linking it to the Notebook with a suitable cable and using the Notebook's Serial Terminal program to establish contact and send/receive documents. The terminal program can also be used to control a modem connected to the Notebook, but note that it does not provide facilities for auto dialling, off line reading, etc.

Because the word processor built into your Notebook is a development of the "Protext" word processor produced by Arnor, you may like to use the Notebook for entering documents on the move and then transfer them across to a desktop computer which also can run Protext to work on them in more detail when you return to the office. There are versions of the Protext software to run on all well known types of computer (IBM PC compatibles, Amstrad PCW, Commodore Amiga, Atari ST, Acorn Archimedes) They are available from:

Arnor Ltd
611 Lincoln Road
Peterborough
PE1 3HA

Tel: 0733 68909
Fax: 0733 67299

Even though you don't use Protext on your desktop computer you may still want to transfer documents from the Notebook to use in a different word processor. In this case you can still transfer the documents, choosing to convert them to WordStar format which is a format readable by many different word processing programs. If the word processor you intend to use cannot use WordStar format you can use plain ASCII but all formatting and layout will be lost.

You can transfer documents in the other direction (from desktop into the Notebook) as well. You would do this when you want to retrieve a previously saved document or when you want to

continue working on a document at home that you had started in the office. If you use the Protext word processor on the desktop machine then you can transfer documents to the Notebook before you go home, work on them in the evening or over weekends and then transfer them back to the desktop in the office and all the layout and text effects will be retained.

The spreadsheet software built into the Notebook is a development of "The Cracker" spreadsheet which is available in versions for IBM PC compatibles and CP/M based machines such as the Amstrad PCW range of computers. If you use The Cracker on one of those machines, worksheets (.MEM files) can be transferred directly from the Notebook to the other computer with all formatting and formulae intact. If you use some other spreadsheet software you can still export the data from your worksheets in .DIF, .DAT or .TXT files. However, the formulae will not be retained.

Note: The following tends to refer just to PC computers but what is said will apply equally as well to any other type of computer.

Serial or Parallel transfers ?

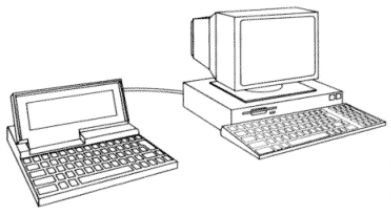
The Notebook can transfer documents either through its serial port using Xmodem/CRC or no protocol file transfers. Alternatively it can use the parallel port. Using the serial port you will just need a cable and some communication software for the PC or other computer that you are trying to connect to.

If you want to use the parallel port you must use the "Lapcat" software and cable that is available from Arnor at the above address. The advantage of using parallel transfers is two fold. Firstly you don't have any problems getting the right cable and making the right software settings and secondly, it is a faster method of transferring documents. Instructions on how to perform Lapcat transfer are given in the manual accompanying the Lapcat cable and software.

Serial transfers

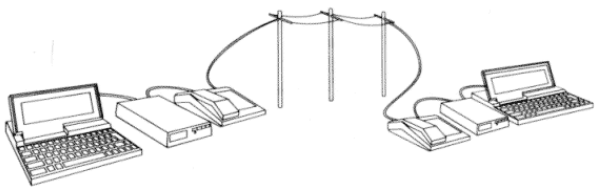
Before you can transfer documents to and from the Notebook you must physically connect it to the other computer. There are two ways in which you might do this:

"Local" connection



If the other computer is located in the same room as the Notebook then it will only be necessary to use a simple ("Null modem") cable to connect the two machines together. When you do this you connect the serial ports of the two computers together. The serial port on your Notebook is the 9 pin D shaped connector on the back of the machine. The actual connection for a serial port on another computer may vary from machine to machine. IBM PC compatible machines normally have either a 9 pin connector the same as the Notebook or they may have a 25 pin connector.

"Remote" connection



If the other computer is some distance away then you will need to make use of a device called a Modem that allows computers to send information over the telephone. Both the distant computer

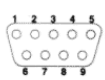
and the Notebook must have a modem attached to their serial ports. This second option is effectively the same as a local connection except that the Notebook is connected to a modem using a "straight through" cable in which "Transmit" (Tx) connects to "Transmit" and "Receive" (Rx) connects to "Receive" and so on.

When you use the serial terminal program in the Notebook you will be able to type commands to the modem. If it is a Hayes compatible modem you would normally use the command ATD<*number*> in order to telephone the other computer that you wish to connect to. Once connection is established you can proceed to send and receive documents in a similar fashion to that described below for a local connection.

Technical note: One point you may find useful to know is that if you leave the serial terminal program, the Notebook's serial port is switched off to conserve battery life. If you are connected to another computer via a modem the connection will almost certainly be lost when you do this. To prevent this happening you must instruct the modem to ignore the state of its DTR line. On some modems the command AT&D0 will instruct the modem to ignore this signal. Other modems have a switch setting that will achieve the same effect. If you cannot control the modems DTR signal then you must not leave the serial terminal program if you wish the connection to be maintained.

The Cable to use

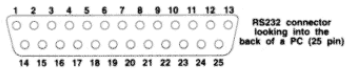
The Notebook's serial port has a 9 pin, male, D-type connector wired as follows:



RS232 connector looking into the back of NC200

Pin	Signal	Abbreviation	Direction	
1	Not connected			
2	Receive data	RX	In	
3	Transmit data	TX	Out	Note:
4	Data terminal ready	DTR	Out	DTR just duplicates RTS
5	Ground	GND		
6	Not connected			
7	Request to send	RTS	Out	
8	Clear to send	CTS	In	
9	Not connected			

The computer you are trying to connect to will probably have either a 9 pin or 25 pin, male, D-type connector. Assuming it is wired the same as an IBM compatible PC computer, the connections will be as follows:



Signal	Abbreviation	Direction	Pin Nº on 9 pin	pin Nº on 25 pin
Ground	GND		5	7
Transmit data	TX	Out	3	2
Receive data	RX	In	2	3
Request to send	RTS	Out	7	4
Clear to send	CTD	In	8	5
Data set ready	DSR	In	6	6
Data terminal ready	DTR	Out	4	20
Ring indicator	RI	In	9	22
Frame ground				1

As you can see, both the Notebook and the other computer (if it has a nine pin connector) have their transmit data signal on pin 3 and their receive data signal on pin 2. You cannot just connect the similar named signals because transmit would connect to transmit and receive to receive. The transmit from one end must be connected to the receive line at the other and vice versa. Some of the other signals must be crossed over in a similar way.

A cable that crosses over the various signals in this way is often called a **Null Modem Cable**. The correct wiring for cables to connect the Notebook to an IBM PC compatible are:

9 pin to 9 pin Null Modem Cable

NC200		Other Computer	NC200	Other
RX	2	2 RX	2	to 3
TX	3	3 TX	3	to 2
DTR	4	5 GND	4	to 6
GND	5	6 DSR	5	to 5
RTS	7	7 RTS	7	to 8
CTS	8	8 CTS	8	to 7

9 pin to 25 pin Null Modem Cable

NC200		Other Computer	NC200	Other
RX	2	2 TX	2	to 2
TX	3	3 RX	3	to 3
DTR	4	4 RTS	4	to 6
GND	5	5 CTS	5	to 7
RTS	7	6 DSR	7	to 5
CTS	8	7 GND	8	to 4

If you are not able to buy a cable that is specifically designed for connecting the Notebook to other computers, you should be able to show these details to any cable manufacturer advertising in the

computing press and you will find that they will easily be able to make up the right cable for you.

Making the software connect

Once you have plugged the correctly wired cable into both the Notebook and the other computer you are trying to connect to, you are ready to try and see if the two will communicate. The Notebook already has the necessary software to do this built-in.

On the other machine you will need to use some communications software. The software you use will depend on the type of computer but, for example, if you are using a PC compatible that has a copy of Windows 3.x then you already have the necessary software. There is a program called Terminal included in Windows that will do. The communications software you use can be very simple indeed although it would be best if it supports Xmodem file transfers. The PC shareware program "Telix" is highly recommended.

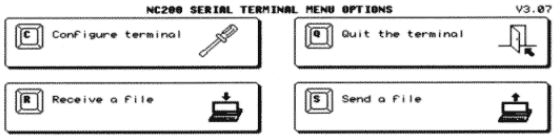
The Notebook's Serial Terminal program

All communications with another computer will usually be performed from within the Notebook's Serial terminal program (the other transfer functions in the List Stored Document menu are for use by the Lapcat cable and software that is available from Arnor). The terminal program emulates a DEC VT52 terminal. Details of the escape codes it generates/recognises are given in Appendix 4.

You start the Serial terminal program by pressing [Function][S]. On doing this you will see the following screen:

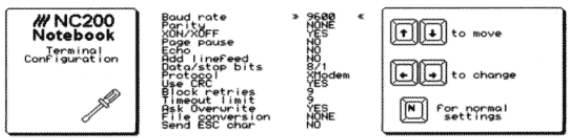
If you already had everything set up correctly, from when you last used the terminal program, you could just press [↵] to immediately start communication with the other computer. But when you first use the Serial program you will almost certainly need to set certain values correctly before starting.

When you are using the Terminal program you will find that the [Menu] key brings up a screen that is used for both setting various features related to the serial port and also for sending and receiving files:



You can quit the terminal from this screen by pressing [Q]. While actually in terminal mode you can normally press [Stop] to leave the terminal but if you have changed the **Send ESC char** option (detailed below) then it is not possible to use the [Stop] key to get out of the serial terminal program because that key will just produce an ESC character. You must press [Menu][Q] to leave.

From this menu you press [C] to configure the options within the terminal program.



Without getting into long discussions about serial connections (which can be a very complicated subject) it is only really necessary for you to know that there are certain values associated with the serial port that must be set correctly before you can get two computers to communicate. Both ends should be set to the same values.

The **Baud rate** is just a measure of the speed at which the computers communicate. It can be set to a value chosen from 300, 1200, 2400, 4800, 9600, 19200. For a direct connection it is probably best just to try it at 19200 and only reduce it if there appears to be a problem or the other end cannot operate at that speed. You may find that the software used on the other computer limits you to a top speed of 9600 baud. This is the default setting.

The other things that can be set that affect the serial port are the number of **Data/stop bits** and the **Parity**. It isn't important to know

what these things are - just to ensure that both computers are set to the same values. Data bits should normally be set to 8, with 1 stop bit. This is shown as 8/1. The Parity should normally be set to NONE. The Notebook allows you to change these things if the software at the other end does not present a suitable choice, but almost all terminal software does allow these things to be changed and almost all will choose 9600, 8 data, No parity, 1 Stop bit as the default setting anyway. If you try to use a particularly old/slow modem you may find it useful to set 2 stop bits rather than just 1.

The **XON/XOFF** option selects whether or not the XON/XOFF software handshake protocol is used. This is a system by which one end can tell the other end to stop transmitting for a short while if it is sending data too fast. Try setting this option to "Yes" if characters are being lost. However, it does rely on the other end also understanding Xon/Xoff.

The **Page Pause** would normally be set to Yes when you are receiving screenfuls of data from the other end while using the terminal and it is scrolling off the screen to quickly to read. With Page pause on it will stop after every 16 lines and wait for a key press.

The **Echo** option determines whether the characters you type are shown on the Notebook's screen as well as being transmitted to the other computer. If the other end does not echo back the characters that you type you won't be able to see what you are typing. In this case you should switch echo on.

The **Add linefeed** option determines whether an extra line feed is performed for every carriage return received. Also, when this option is set to Yes the [↵] key will generate both CR and LF codes instead of just the normal CR code. If lines are not broken where they should be then turn this option on. If, on the other hand, lines are double spaced, make sure this option is set to Off.

The **Protocol** option lets you choose between Xmodem and no protocol. When sending and receiving files you should always use Xmodem if you can. This is a system whereby the data to be sent is split into small packets and the other end confirms that each was received correctly. This means that you can be certain that no errors are introduced during the transfer process. This is explained in more detail later in this section.

The only reason to set the protocol to "None" is if the software on the other computer does not support Xmodem file transfers. When Xmodem is not used the data is just sent as one single block and the other end must capture the complete block of information and write it to a file. However, this can be prone to errors.

The **Use CRC** setting should always be set to Yes. This is the type of error checking used during the Xmodem file transfer. The other possibility is "Checksum" but this is an older method. Only change this setting if you know that the other end only supports Xmodem/Checksum.

The **Block retries** option sets the number of times an attempt is made to send an Xmodem packet before the transfer stops with an error.

The **Timeout limit** option sets the length of time in seconds that the Xmodem transfer will wait for the other end to respond to a request before assuming an error has occurred.

Ask Overwrite determines whether the serial terminal should stop and ask you if you really want to over write a file if the name you give for receiving already exists.

The **File conversion** option determines whether the data that is sent from the Notebook should be left in Protext format including all of its special codes for use in a copy of Protext on another computer (it is available from Arnor for PC/PCW/Amiga/ST/Archimedes). If you are exporting the data for use in any other word processor you should set this option to either WS (for WordStar) or ASCII. The merits of each of these file conversions was discussed in the section "Using the floppy disk drive".

If you change the options in the configuration menu and want to set them back to their initial starting values just press the [N] key for the Normal settings.

Making sure the connection works

Once you have the machines connected and they are both running terminal software you should find that if you type characters on the Notebook keyboard they appear on the screen of the other computer and vice versa. Each time you intend to transfer files to/from the Notebook it would be advisable to start by entering the Notebook's Serial Terminal program ([Function] [5]) and

just type a few characters on each keyboard to make sure that transmit and receive are working OK. There is no point in spending a long time trying to transfer files only to find that the fundamental connection that allows characters to be sent in both directions was not working.

Once you have established a sound connection between the two machines you should then be able to transfer files between the two. If you find that typing on one machine does cause something to appear on the other but the characters are just meaningless rubbish then it is probably because one of the baud rate, data bits, stop bits or parity settings are not correctly matched.

Note: The RS232 (Serial) port on the NC 200 uses signals at a higher levels than normally used inside the Notebook. This means that the batteries will drain at a faster rate than normal when making serial transfers. It may be an idea to run the Notebook from the mains adaptor when transferring files.

Choosing the correct transfer method

The Notebook can use two different types of file transfer. There is a very simple form where no protocol is used and a more powerful, versatile and reliable method called Xmodem. We suggest you always use Xmodem file transfer whenever possible. Xmodem file transfer breaks up the information to be sent into small packets and sends each with some extra information that the receiving end can use to make sure that no faults were introduced.

Document transfers without Xmodem

The simplest form of file/document transfer is with "Protocol" set to None. This is provided so that people who cannot find software to support Xmodem transfer can still connect their Notebook to other computers. When you ask the Notebook to send a document without using Xmodem it just sends each character from the document you choose as if you were typing them directly in the serial terminal itself. On the computer that is receiving the file you just have to switch its ASCII capture on before starting to send the file. Once the Notebook has finished sending the file you can switch the capture off on the PC and the information that has been sent will be written to a file.

When transferring files from a PC to the Notebook using no protocol you start the receipt of the document on the Notebook. Initially it waits for the first character to be transmitted (you can always press [Stop] if you didn't want to transfer a file). As soon as it has received the first character it then allows a maximum of 2 seconds for each subsequent character to be received. If a longer delay is encountered then the Notebook assumes that the other end has finished transmission. Stopping transfers in this way means that there is no need for End of File characters to be sent.

The length of time it waits for the initial character to be sent is the timeout period set in the Transfer settings. Normally this would be 9 seconds so you need to be ready to start the transmission of information from the PC before selecting the receive function.

To send a file, from the Notebook to a PC, without using Xmodem:

1 Make sure the serial terminal configure menu has the **Protocol** option set to **None**.

2 If the file is for use in Protext on the PC, make sure **File conversion** is set to **None**. If the file is not for Protext, set it to either **WS** or **ASCII**. WS will convert Protext codes to their WordStar equivalent. ASCII will strip out all special codes.

3 Establish the connection. Type a few characters on each keyboard and make sure they appear on the screen of the other computer.

4 Make sure the receiving end is ready to receive the file. This will usually involve giving some sort of command to initiate an ASCII capture or "download". Because the Notebook can have longer filenames than on PCs (and use a bigger range of characters) you may have to change the name you give the file to be received at the PC end.

5 In the Notebook's terminal program press the [Menu] key followed by [S] to select the **Send a file** option.

6 Position the cursor over the document to send. If there are more documents in your Notebook than can be shown on the screen use the [Word ←] and [Word →] keys to move to the others from the first or last column. If **Document sizes/date display** is set to **Shown**

in the System Settings menu then you may see ADDRESS BOOK and DIARY FILE in this list.

7 With the cursor over the document that you wish to send press [↵] and the transmission process will begin. The counters on screen give an idea of how much information has been and will be sent. The "blocks" mentioned here are blocks of 128 characters each.

8 If you have asked for conversion to ASCII or WordStar you will see a reminder on screen that the conversion process is active and the actual number of blocks sent will probably be less than the initial estimate as some characters are removed during the conversion process

9 Once the Notebook has sent the document it will return to the normal terminal screen. Press [Menu] to send more files or to quit.

10 At the receiving end stop the file transfer. In some software this may be as easy as just pressing the Esc key, while in others you may have to give a command or select a menu entry to do this.

To receive a file, into the Notebook from a PC, without using Xmodem transfer:

1 Make sure the serial terminal configure menu has the **Protocol** option set to **None**.

2 Establish the connection. Type a few characters on each keyboard and make sure they appear on the screen of the other computer.

2 At the PC, select the function that will send the file as just straight ASCII text. This might be called something like "ASCII Send" or "ASCII Upload".

3 You will probably then be given the opportunity to select the file to send. Type its name but do not press [↵] yet.

4 On the Notebook press the [Menu] key to select the serial terminal menu and then press [R] to receive a file.

5 If you want to receive a backup copy of a file that already exists position the cursor over the file of that name and press [↵]. If,

however, it is a new file then position the cursor over the special **(New file)** entry and press [↵].

6 If you selected (New file) you will then be asked to give a name for the document that is about to be received. You could just type the same name as used on the PC (8 characters, a full stop, then 3 characters).

7 If you select a file name that already exists and have the **Ask overwrite** option set to **Yes**, you will be asked to confirm that you wish to overwrite the existing file. Press [Y] if this is what you want.

8 Once the Notebook has started the receive function you have 9 seconds (or whatever the timeout value was set to) to start transmission of the file (document) from the PC. Just press [↵] on the PC to start it transmitting the file whose name you nave already entered.

9 Once the file has been received (there was a delay of longer than two seconds between characters) you are returned to the terminal screen.

Xmodem file transfers

You should always choose to use Xmodem file transfers in preference to the no protocol option. Xmodem is a far more reliable method to use and is supported by virtually every piece of communication software you might find on other computers.

There are actually two types of Xmodem protocol - Xmodem/CRC where a "Cyclic Redundancy Check" is used to check for errors and an older method known as Xmodem/Checksum. The latter is used in some older pieces of software. You can use the Configure terminal menu to specifically choose between CRC or Checksum. However, it is best to leave this setting on YES which selects CRC as one of the features of the CRC protocol is that if it cannot start communication within ten seconds using CRC it will automatically switch over to the Checksum method anyway. In the Configure terminal menu you can also set options to choose how many times a block is retried before the transfer is aborted and how many seconds the program waits before assuming that an error has occurred.

To send a file, from the Notebook to a PC, using the Xmodem protocol

1 Make sure that the serial terminal Configure menu has the **Protocol** option set to **Xmodem** and the **Use CRC** setting should be set appropriately.

2 If the file is for use in Protext on the PC, make sure **File conversion** is set to **None**. If the file is not for Protext, set it to either **WS** or **ASCII**. WS will convert Protext codes to their WordStar equivalent. ASCII will strip out all special codes.

3 Establish the connection. Type a few characters on each keyboard and make sure they appear on the screen of the other computer.

4 On the Notebook while in the serial terminal press [Menu] followed by [S] to select the send a file function.

5 Position the cursor over the document to send. If there are more documents in your Notebook than can be shown on the screen use the [←] and [→] keys to move to the others from the first or last column. If **Document sizes/date display** is set to **Shown** in the System Settings menu then you may see ADDRESS BOOK and DIARY FILE in this list.

6 With the cursor over the document that you wish to send press [↵] and the transmission process will begin. Notice that, unlike the no protocol send, you actually start transmitting the file before giving the instructions to receive it at the other computer.

7 Once you have started the send operation you must instruct the other end to start receiving it. This will depend on the software you use but you may find it called "Xmodem download". You will be asked to give a filename that the information will be stored in on that computer.

8 Once you start the Xmodem receive on the other computer the information will be transferred. You will see a counter on the Notebook showing you how many blocks of 128 characters it has sent.

9 If you have asked for conversion to ASCII or WordStar you will see a reminder on screen that the conversion process is active

and the actual number of blocks sent will probably be less than the initial estimate as some characters are removed during the conversion process

10 Once the Notebook has finished sending the file it will revert to the serial terminal screen. At the PC end it will automatically finish the transfer and write the data into the file whose name you gave earlier.

Note that when the Notebook sends information using the Xmodem protocol the number of characters sent is often a number larger than the actual number of characters in the document. The reason for this is that Xmodem always rounds up the number of characters to send to a multiple of 128.

It is possible to perform the transfer by starting the PC receiving before the Notebook starts sending but there will be a few second delay while the two machines synchronise.

To receive a file, into the Notebook from a PC, using the Xmodem protocol:

1 Make sure that the serial terminal Configure menu has the **Protocol** option set to **Xmodem** and the **Use CRC** setting should be set appropriately.

2 Establish the connection. Type a few characters on each keyboard and make sure they appear on the screen of the other computer.

3 On the Notebook while in the serial terminal press [Menu] followed by [R] to select the receive a file function.

4 If you want to receive a backup copy of a file that already exists position the cursor over the file of that name. If, however, it is a new file then position the cursor over the special **(New file)** entry. Do not press [↵] yet - you should start the transmission from the PC before the Notebook starts to receive. Note, it would be unwise to try and receive a file as an address book or diary file that wasn't originally sent as one from the Notebook.

5 At the PC end give the command to the software to start sending the chosen file. This may be called something like "Xmodem upload" or "Xmodem Send".

6 Once the PC has started to send the file press [↵] on the Notebook to start receiving the file.

7 If you selected (New file) you will then be asked to give a name for the document that is about to be received. You could just type the same name as used on the PC (8 characters, a full stop, then 3 characters).

8 If you select a file name that already exists and have the **Ask overwrite** option set to **Yes**, you will be asked to confirm that you wish to overwrite the exisitng file. Press [Y] if this is what you want.

9 When the transfer is complete the Notebook will return to the normal serial terminal screen.