

AMSTRAD RS232

BY



RS232 Serial Interface
Including COMMSTAR, Viewdata &
Terminal Communication Software
for the **AMSTRAD** *CPC464/664/6128*

User Guide
for
Commstar, Honeyterm and Honeyview
for the Amstrad CPC
series micro-computers.

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Chapter 1

Getting Started

1.1 Installation

Complete interface pack

If you have purchased the RS232/Commstar interface you should have received the following items :

- 1 Interface with parallel lead and edge connectors
- 1 50 way adaptor circuit board
- This user guide
- User Registration card

If you also have an Amstrad modem, the instructions for installing and using it are included in a separate guide. This section details the installation of the RS232 interface itself with the remainder of the manual describing the Commstar communications software.

The RS232 communications interface must be fitted using the parallel connection cable provided. One end of this cable terminates within the interface housing, the other is fitted with two card edge sockets. An 50-way socket adaptor board is also provided for the CPC464 so that both the disc interface (if fitted) and RS232 can be used simultaneously. It is very easy to fit, just carry out the following operations :

1. Switch OFF the power to your Amstrad (and disc drive if you have one).
2. On the CPC464 the RS232 interface connects directly to the FLOPPY DISC port via the parallel cable. On the 6128 and 664 machines the EXPANSION port is used.

If you have a 464 with a disc drive and interface, you should remove the disc interface and put it to one side. Take the small adaptor circuit board and push it firmly into the socket on the parallel cable which is nearest to the interface housing. It will fit in four different ways but it does not matter which way you insert it. When it is in place connect your disc interface onto the protruding edge connector of the adaptor board.

On a 6128, 664 or 464 without discs, simply connect the socket at the end of the parallel cable to the Expansion/Floppy disc port edge connector appropriately.

3. Connect the 25-way D-type socket on the RS232 lead to it's counterpart 25-way plug on the RS232 interface and connect the other end of the lead to the serial port of your modem.

Warning : Never install or remove the RS232 interface while the power to the Amstrad

computer is turned ON. Permanent damage to both the computer and interface may result.

To check that installation is correct, switch on the power and you should see a signon message similar to :

Commstar (c) 1986, Honeysoft Ltd.

or

Honeyview (c)1985, 1986 Honeysoft Ltd.

Honeyterm (c)1985, 1986 Honeysoft Ltd.

Important note : The CPC6128 machine has current limiting circuitry within the monitor. It is possible that with an interface such as the RS232 fitted to the EXPANSION port, power-up from the keyboard switch will be unreliable. If this is the case, leave the keyboard switched ON and power-up using the switch on the monitor.

Commstar is accessed by typing :

I CS [ENTER]

which will present a menu to allow selection of either Honeyterm or Honeyview. Alternatively, each individual program can still be accessed using the commands I HT or I HV as above.

It is also possible, having entered either Honeyview or Honeyterm, to switch to the other by using the menu under [CTRL]8 (see section 4.12).

1.2 User Registration

When the interface/software has been correctly installed the serial number should be filled in on the registration card for return to Pace Micro Technology. The serial number can be displayed by typing :

I CS.ID or I HT.ID or I HV.ID

appropriately, which will display a window containing a message such as :

Commstar 1 Serial : nnnn
(C) 1986 Honeysoft Ltd.
Press any key to continue

where nnnn is the serial number. Alternatively, typing [CTRL]? from within either Honeyterm or Honeyview will have the same effect.

HONEYTERM Serial : HTnnnn
(C) 1985, 1986 Honeysoft Ltd
Press any key to continue

The serial number nnnn should be filled in on your registration card which should then be returned to :

Pace Micro Technology
Allerton Road
Bradford
West Yorkshire
BD15 7AG

NO user support will be provided if this card is not returned! Please ensure also that this number is quoted in any correspondence.

Chapter 2

Introducing Communications

2.1 Overview.

Honeyterm and Honeyview are two communications programs which allow the Amstrad CPC range of microcomputers to access the main types of remote information service that exist.

Honeyterm is an ASCII terminal program which allows the Amstrad to behave in much the same manner as a terminal connected to a mainframe or mini-computer in a commercial data processing environment. Honeyview behaves differently in that it will only communicate with a Viewdata host such as Prestel. The result is very different as you will come to realise when you are more familiar with the two types of system. Commstar combines both programs in a single package so that you have the best of both worlds.

British Telecom's Prestel service is probably the best known of the online services to which you might wish to subscribe. It provides almost instant access to a multitude of up-to-the-minute information pages detailing world news or weather, latest travel bulletins and much more. Similarly, Viewfax and Micronet 800 provide a range of services within the umbrella of Prestel, which are aimed particularly at microcomputer owners and offer tele-software, programming advice, news and other facilities.

The term 'bulletin board' is also used frequently with reference to communications. Bulletin boards are micro-computers equipped with Auto-answer modems and some special software which allows them to answer incoming calls from other computers, take messages and provide the caller with access to their files or programs, and messages left by other users. If you have a problem, someone out there has a solution, so why not ask them? Simply leave your message on one or more of the many bulletin boards that have now been established and for the cost of a phone call you will soon have an answer. For this purpose, and for accessing mainframe information services such as Telecom Gold, you would use Honeyterm.

Honeyterm also has the added advantage that it can be used to talk to other microcomputers. How many times have you wanted to get a copy of a program to a friend or a business colleague, quickly? With Honeyterm you can transfer a file of ANY type, between two Amstrads (or an Amstrad and another micro), in the space of a phone call.

The ability to communicate adds a valuable and versatile dimension to your computer and takes it out of isolation. Large computers have been communicating with each other for years, now micro-computers can too.

2.2 Communications software.

How does a terminal program such as Commstar work? Basically it serves to manage the data that is received from and sent to the serial interface. It provides the software to drive the communications hardware and thus create an environment in which meaningful communication can take place. Commstar is particularly versatile and includes many advanced facilities to make it easy to talk to an enormous range of remote systems.

Commstar looks after all the file handling that takes place during the transfer of data, it looks after the various protocols that are used to ensure correct communication and it displays only the information that you are supposed to see. Essentially it is the brain of the system which interprets the signals it receives and acts accordingly. Obviously there are many 'housekeeping' functions which must be carried out but Commstar 'hides' all of these from the user making it very simple to use.

2.3 Communications hardware.

Whereas the software provides the brain behind communications, the hardware (a serial interface and modem) provides the physical mechanism, the voice and ears, so to speak.

The serial interface is necessary because within a computer, information is transferred between different components in parallel. You may often hear the Z80 processor chip which is used in the Amstrad machine referred to as an '8-bit processor'. This indicates that the internal paths along which data is transferred are 8 bits wide ie. there are 8 separate wires which carry data, in the form of electrical signals, around the computer simultaneously. However, when large distances are involved this method becomes unsatisfactory. The individual bits of data tend to travel at different speeds within the wires and introduce what is known as 'data skew' i.e. the data becomes garbled. Apart from this it would be rather expensive to lay eight wires across the country instead of one!

In order to overcome these problems it is necessary to serialise the data and transmit it a single bit at a time through a two or three wire transmission circuit. This is the function of the RS232 serial port provided with Commstar.

The RS232 interface converts data from your computer into serial form which makes it suitable for transmission over longer distances than would be possible with a parallel port. Data skew in parallel lines is the main reason that data cables used on disc drives and parallel printers are rarely longer than about 1.5 metres.

When an RS232 interface is used in conjunction with a length of suitable cabling, data can be transferred to and from other computers easily. Communication is only meaningful however, if the parties involved understand each other. In this respect, some form of 'protocol' is required to ensure that each computer knows how to interpret the signals it receives from the other. This protocol is the equivalent of word, sentence and paragraph structure in English i.e. the correct punctuation must be used in order to ensure that the text makes sense to the reader. Commstar, in conjunction with the associated hardware, provides the necessary environment for ordered communication to occur.

2.4 The role of the telephone.

It is both impracticable and expensive to connect two computers together over a long distance with a direct wire connection (commonly referred to as hard-wiring). Apart from the technical problems associated with laying the cable, there is a limit to the distance even a serial signal can travel without being 'boosted'.

The simplest solution is to use a network of cabling which already exists, the Public telephone network. There are however, a number of technical difficulties associated with using telephone lines in this way. These arise from the fact that they were not designed to carry digital signals from computers; they were designed to carry analogue wave forms, in particular, the human voice. Digital signals must be converted into analogue form before they can be passed to the telephone network and this task, called modulation is carried out by a Modem. In fact the modem carries out two jobs: that of converting the outgoing signal into analogue form and the reciprocal task of converting incoming signals into a form which the receiving computer can understand (demodulation). Thus a modem both MODulates and DEModulates electrical signals. In simple terms, it is the interface which allows you to connect your computer to the telephone system.

It is possible therefore, with a suitable communications port and the appropriate software, together with a modem and a telephone, for two computers to communicate over a very great distance. The Amstrad RS232 interface and Commstar software provide all you need.

2.5 Accessing Commstar

You should now be ready to start using your communications pack so to activate Commstar type :

I CS[ENTER]

The I symbol is obtained by using [SHIFT] and @ together.

You should now have an introductory page on the screen with two menu options. The first of these will run the Commstar viewdata program Honeyview which allows access to viewdata systems such as Prestel. The second option will run the ASCII program Honeyterm for use on standard 'scrolling screen' systems such as Telecom Gold and bulletin boards or for use in talking to other micros.

To exit any of the programs back to Basic press [CONTROL], [SHIFT] and [ESC] simultaneously.

2.6 Commstar fundamentals

This section describes those features of Honeyterm and Honeyview which are common to both programs. These include the pop-up windows and menus which make it so easy to use, the use of filenames etc. Reading this section first will make the rest of the manual easier to follow and will clarify some of the terminology.

Throughout the text, characters or words in square brackets indicate keys on the Amstrad keyboard which do not produce a printable character. For example, [ESC] refers to the Escape key etc.

Note that the 6128 keyboard is different from those of the 464 and 664 and where reference is made to the [ENTER] key or Large [ENTER] key, 6128 owners should use the [RETURN] key. Only references to the small [ENTER] key or the [ENTER] key near the numeric keypad refer to the [ENTER] key on the 6128.

2.6.1 Menus and Windows

Both of the Commstar programs use a system of 'pop-up' menus to set parameters and control various options. These menus take the form of a window that appears in the middle of the screen, overwriting the current display. Each window consists of the title bar and the option area which lists the options available. The title or name of the menu appears in the top line of each window and serves to describe the type of commands in the menu.

A menu is essentially a list of options and normally there will be a pointer next to one of the options. If Commstar is operating in Mode 1 this pointer takes the form of a tick on the left hand side of the option, if mode 0 is in use the pointer takes the form of square brackets surrounding the option. The option next to which this pointer is situated is referred to as the currently 'selected' option.

The pointer can be moved around the options in the menu by using the up and down cursor keys. When it is against the required option press [ENTER] to select that option.

Some options have a direct effect as soon as you use the [ENTER] key to select them, other will display a further 'sub-menu' which works in the same manner as the main menu.

To exit from a menu without changing the currently selected value or option, or when you have made the appropriate selection, you should press [ESC]. This will return you to the previous menu level, or if you are at a main menu, will place you back into the operating mode from which the menu was originally selected.

2.6.2 Entering filenames

Several options that access the filing system require a filename to be entered from the keyboard. This is necessary when loading or saving a file to disc or tape or to one of the RAM buffers (see section 3.8), and when downloading and saving Telesoftware programs. In each case, a window will appear in which to enter the filename.

Filenames must conform to the requirements of the filing system being used. In the case of the internal buffers and tape filing system, the name can be up to 16 characters long. If the disc filing system is active, the name chosen must conform to AMSDOS conventions. These state that a filename may consist of up to 8 characters which may optionally be followed by a '.' and a 3-letter type identifier. The name may also be preceded by a 'user area identifier' for the disc. The user area is a number less than 15 optionally followed by a drive letter (either A or B), and must always be terminated by a colon.

Example disc filenames are :

| | |
|---------------|---------------------------------|
| SAMPLE | : filename only specified |
| SAMPLE.DOC | : filename and type specified |
| 5:SAMPLE.DOC | : user area specified |
| 5B:SAMPLE.DOC | : user area and drive specified |

When you are entering filenames you may use the following keys :

| | |
|----------|--|
| [DEL] - | deletes the last character entered |
| [CLR] - | erases the entire filename |
| [ESC] - | cancel filename entry and returns to the menu |
| [COPY] - | is used in the viewdata program to copy the frame number displayed at the top of the current Prestel page into the filename. When using the disc filing system take care that this number does not exceed 8 digits, only the first 8 digits are used and you may overwrite an existing file if the currently displayed frame uses the same first 8 digits as one which has already been saved. |

Chapter 3

Honeyview

3.1 Introduction

The Honeyview program allows your Amstrad to emulate the type of terminal which is used to access viewdata services such as Prestel. Instead of using a standard 'scrolling' screen to display information and messages, viewdata systems rely on colour graphics and text frames which occupy the entire screen area (24 lines of 40 characters). Normally, special hardware is required to display these screens in their correct form. However, with the aid of appropriate software such as Honeyview, micro-computers can be used to reproduce the displays very accurately.

Other features of Viewdata systems include Telesoftware i.e. the transmission of computer programs down the telephone lines into your computer, and to an increasing extent, Teleshopping and Homebanking.

There are now several telesoftware areas under Prestel Microcomputing offering Amstrad programs which can be downloaded using Honeyview. There are also telex, electronic mail and mail order facilities all of which can be readily accessed with the use of a modem and appropriate software.

Now Load and run Honeyview as described earlier.

The screen will clear except for the bottom line which is used as a Status line to display system and control messages.

At the left of this line is the program name, Honeyview followed, if you have a 6128, 664 or 464 with a disc interface fitted, by A: which is the currently selected drive number.

After this there is a clock display which is updated every minute to show elapsed time. If no RS232 interface is fitted the clock will not be shown.

The area in the middle of the screen is used to indicate the status of the Caps-lock and Shift-lock keys with the message Caps or Shift appearing when the locks are active.

Finally, at the right of the screen is the message READY or ONLINE, which tells you that the system is ready to communicate with a viewdata host.

To exit Honeyview from this point you may use [CTRL][SHIFT][ESC] which will return you to Basic.

3.2 Special keys

When Honeyview is active, several of the keys on the Amstrad keyboard are reconfigured to generate some of the most common commands used on Prestel. If you are not already familiar with viewdata systems and the commands they use, it is advisable that you read the Prestel Directory (which you receive when you first subscribe), before proceeding further.

3.2.1 The STAR character '*'

This is the key used by Prestel and other viewdata systems to select various functions whilst online. To obtain '*' you may use the normal [SHIFT]: key. For convenience however Honeyview also reconfigures the decimal point key on the numeric keypad to give '*'.

3.2.2 The HASH character '#'

Hash is another character used frequently by Prestel and is essentially the equivalent of the [ENTER] key. Within Honeyview it can be obtained using either [SHIFT]3 or the [ENTER] key located near the numeric keypad.

3.2.3 The [DEL] key

[DEL] normally gives a character sequence that both backspaces and deletes the previous character. In Honeyview this is only true during mailbox editing, at other times the key is ignored.

Some Prestel frames contain hidden information which can be revealed by the user on request. When used in conjunction with [SHIFT], [DEL] is used to carry out this function and also to re-conceal information which has already been revealed. A frame that contains concealed information will generally inform you when to use the Reveal function.

[CTRL][DEL] is used to generate the 'blob' or inverse space character (ASCII 7FH) during editing should you need it.

3.2.4 The [COPY] key

The [COPY] key is used to request a frame to be retransmitted, when, for instance it is corrupted by noise during display. For those frames which are constantly updated with new information you will not be re-charged for the frame i.e. the [COPY] key is equivalent to the Prestel *00# command.

To request a new version of an update frame use [SHIFT][COPY]. This is the same as the Prestel command *09#.

One final use for the [COPY] key is to copy the Frame-id which is found at the top of every Prestel frame, into a filename at a menu. Care must be taken to ensure that the length of the ID is consistent with file naming conventions.

3.2.5 The cursor keys

Whilst online the cursor movement keys are used as follows :

[RIGHT-CURSOR] - move to next frame in sequence e.g. if the current frame is 1a, pressing [CURSOR-RIGHT] will move to frame 1b. Note that this is equivalent to pressing # or [ENTER].

[LEFT-CURSOR] - move to previous frame, this is equivalent to the *# command. It is only possible to back up three frames and you may occasionally be routed via an intermediate frame.

[UP-CURSOR] - request main index, this is equivalent to entering *0#.

3.3 Logging on to Prestel

Once you have entered Honeyview so that the status line is displayed at the bottom of the screen, it is ready to use immediately to talk to a viewdata system. The RS232 port is automatically configured to operate at the 1200/75 baud rates used by Prestel, with the correct data format (7 data bits, Even parity and 1 stop bit) also selected.

Assuming that your modem is set to receive at 1200 baud and transmit at 75 baud, you should now be ready to dial you local Prestel (or other viewdata system) number and go online. Dial the number and wait for the 'carrier signal' (a high pitched whistle). When this is present connect your modem and wait for the carriers to lock before replacing the telephone handset. You will notice that the READY message on the status line now reads ON-LINE to indicate that a communications link has been established.

Data from Prestel should now start appearing on the screen forming the introductory logon page. This will request your 10 digit Customer Identity number which, should be entered using the normal numeric keys or those on the numeric keypad. If you have not yet subscribed to Prestel there is a free demonstration area which can be accessed by typing 4444444444 for the Customer Identity.

If the page appears corrupted, the likely cause is the noise generated when you replaced the telephone handset. It should not cause any problems but waiting until the page is complete before replacing the handset will prevent corruption of this type.

Each digit of your Customer Identity that you type will appear on the screen as a dash (-), this is for security reasons. Following entry of a valid identity the next frame will be displayed which requests your four character personal password. Once again this will appear as dashes on the screen and typing 4444 will allow entry to the demonstration area.

If at any time during Customer Identity or Password entry you make a mistake, pressing * twice in succession will cancel the entire line and allow you to start again. Remember that with Honeyview you may use either the normal * key or the decimal point key on the numeric keypad to enter *.

Following successful logon, the Prestel front page or the front page of any Closed User Group, such as Micronet, to which you subscribe, will be displayed and you may proceed to use the system.

3.4 The Frame buffers

Honeyview uses the free RAM space on the Amstrad to set up ten 'frame buffers' in memory. These are used for storing copies of Prestel screens so that you may examine them after you have logged off, print them or use them in Carousel mode (see section 3.12).

All ten frame buffers can be saved on disc or tape in a single file or conversely, a file containing previously saved frames can be loaded from disc or tape into the buffers.

Commands for operating on the buffers are described separately in section 3.8.

3.5 The Function keys

Extensive use is made of the 10 function keys, f0 to f9 on the numeric keypad.

Each key when used on it's own produces it's normal numeric value so that commands such as *456# can be easily entered.

In addition, when used in conjunction with the [SHIFT] key the function keys can be used to access your own User defined strings (see section 3.15).

Finally, using the function keys in conjunction with [CTRL] will call up Honeyterm's own programmed functions according to the following list :

- [CTRL] 0 - SCREEN format/control
- [CTRL] 1 - RS232 configuration
- [CTRL] 2 - FILE handling
- [CTRL] 3 - TELESOFTWARE downloader
- [CTRL] 4 - EDIT mode
- [CTRL] 5 - READY/ON-LINE mode
- [CTRL] 6 - CAROUSEL mode
- [CTRL] 7 - PRINT screen
- [CTRL] 8 - DISC RSX commands
- [CTRL] 9 - USER key definition

Most of these keys will present a menu of the type described earlier from which you may choose one of the options by using the cursor control and [ENTER] keys. The following sections describe the use of each key in detail.

3.6 SCREEN : [CTRL] 0

The SCREEN menu is selected by pressing [CTRL] and 0 and includes two options :

SCREEN :

[Mode]
Inks

3.6.1 Mode

Honeyview can display Prestel pages in one of two screen modes, 0 or 1. In mode 0 all the Prestel colours and attributes are supported but the character set is compressed giving a reduced definition.

In mode 1 a standard 40 column character set is used with 8 colours but only 4 of the colours are pure. The remaining four colours are made up using a technique known as stippling where alternate pixels are printed in different colours. This gives a wider choice of colours but tends to reduce colour definition. No flashing is available in this mode. Switching from mode to mode can be done at any time without loss of data by pressing [ENTER] a second time.

3.6.2 Inks

Inks allows the colours of the inks used in the display to be re-configured. If the current screen mode is 0 then a sub-menu appears offering a choice of either Colour or Green. This is intended for switching between green-screen and colour monitors. The colour option sets the inks to standard Prestel colours. Green selects colours which provide better contrast on green screen monitors.

If the current screen mode is 1 a sub-menu will appear with a list of the three currently selected ink colours (the fourth is always black) and a bar chart of the current colours (including stippled colours). You may choose the colour of any of the three inks from any of the 26 which are available.

To change the colour of one of the inks, use the cursor to select the ink and press [ENTER]. A solid block of currently selected colour for that ink will then be shown and the [UP-CURSOR] and [DOWN-CURSOR] keys can be used to step through the other colours. The required colour is selected by pressing [ENTER]. Pressing [ESC] will exit without changing the colour.

When you have selected all the colours you require press [ESC] to return to the screen menu, and then again to go back to READY/ON-LINE mode.

3.7 RS232 : [CTRL] 1

The RS232 menu allows simple configuration of the RS232 interface. There are five options which are used to select the transmit and receive baud rates, the number of data bits and stop bits, and the parity used. The main menu displays all five options with their currently selected values. Pressing [ESC] at this point will exit the menu without making any changes.

RS232 :

```
[TX baud 75      ]  
RX baud   1200  
Parity    Even  
Data bits  7  
Stop bits  1
```

3.7.1 TX baud

Initially the first option, transmit baud rate will be selected and pressing [ENTER] will allow you to change the selected value by displaying a sub-menu of possible baud rates. Normally this should be left at 75 baud, the rate expected by most viewdata systems. The other rates available are 300, 1200 and 2400 which may be required for use with 300 or 1200 full duplex viewdata hosts.

3.7.2 RX baud

Pressing [DOWN-CURSOR] once at the RS232 menu will move the pointer down to the Receive rate which is by default 1200 baud. Once again there should be no need to alter this for use with most viewdata systems but 75, 300 and 2400 baud can also be selected.

3.7.3 Parity

The parity used may be either Even, Odd or None and is normally Even for use with Prestel. Pressing [ENTER] whilst Parity is selected at the main RS232 menu will display a sub-menu of the available options from which you can choose the correct parity type.

3.7.4 Data bits

The number of data bits used may be either 7 or 8 and is normally 7 for Prestel. The alternatives are selected from a sub-menu as usual.

3.7.5 Stop bits

Most viewdata systems use only 1 stop bit for data but options are available for 1, 1.5 or 2 stop bits.

Once you have selected the appropriate values for the RS232 options press [ESC] to exit from the RS232 menu back to the current operating mode. Remember that in most cases you will not have to alter the default settings used by Honeyview, they have been chosen to suit the most common requirements.

3.8 FILE : [CTRL] 2

The FILE menu is accessed using [CTRL] 2 and contains 4 options :

FILE :
[Save]
Load
Cat
Erase

which are used to access the four essential filing facilities for managing viewdata frames and other information. Individual frames may be saved, loaded, catalogued or Erased from one of the buffer pages or from a file on disc or tape.

Each of the four options present further sub-menus to determine the action to be taken.

3.8.1 Save

The Save sub-menu appears as shown below :

SAVE :
[Screen to buffer]
Screen to file
Buffers to file
Text to file
Configuration

Screen to buffer

Choosing this option will allow the screen to be saved to one of the ten internal frame buffers. A catalogue of the currently stored frames is displayed and the cursor keys are then used to select a buffer in which to store the currently displayed frame. Buffers which are already occupied can be overwritten.

Once you have selected a buffer, pressing [ENTER] will position the cursor such that you may enter a name for the frame or use the COPY key to copy the frame id. At least one character must be used for the name otherwise the frame will not be saved. You may use the same name more than once but obviously this is not advisable. Pressing [ENTER] again now will save an image of the frame into the selected buffer. Pressing [ESC] will cancel the operation.

Screen to file

The currently displayed frame can be saved directly to a disc or tape file using this option. A window will be displayed asking for the filename. Remember that the frame id number may be incorporated into the filename by pressing the [COPY] key.

Press [ENTER] to save the frame and the System Messages window will appear to show any of the normal filing system messages which occur during the loading and saving of files. When saving is complete, the message 'Press any key..' will be displayed to allow you to return to the main FILE menu.

Buffers to file

This option allows all 10 buffers to be saved into a single file for use later in Carousel mode. A window will be displayed asking for a filename for the buffers and once again the system messages window will appear during the save operation.

Text to file

The ROM version of Honeyview includes this extra option to save the textual content of viewdata frames into a file for the purpose of editing with a word processing package. Graphics and screen formatting are ignored and the text of the frames is saved sequentially, line by line into the file.

Configuration

Saving the configuration allows the current values for the USER, RS232 and the SCREEN menus to be saved in the specified file. The file can then be re-loaded next time you use Honeyview in order to configure it with the minimum number of keystrokes. It is sensible to use a filename extension such as .CNF for files of this type so that you can recognise them in the disc/tape catalog.

3.8.2 Load

After selecting Load, a sub-menu showing four possible options will be displayed :

```
LOAD :  
[Buffer to screen]  
File to screen  
File to buffers  
Configuration
```

Buffer to screen

This operation performs the reverse of the Screen to buffer option from the SAVE menu. A single frame is loaded from the selected buffer for display on the screen. Initially the first buffer name is ticked and as usual the cursor keys are used to step through to the desired buffer. Pressing [ENTER] will select that buffer for display.

[ESC] can be used to cancel the command and selecting an empty buffer will result in no action being taken.

File to screen

Selecting File to screen will ask you to enter the name of a file. Honeyview will then check the type of the file before loading its contents to the screen. If the file is not of the correct type i.e. it was saved by means other than the Screen to file option from the Save menu, an error message 'Not a page file', will be displayed and the operation will be cancelled. When the load is complete, all windows will automatically be cleared and the new frame displayed. Note that it is possible to load either files or buffers to the screen whilst on-line. To restore the original frame use *00.

File to buffers

This allows a file previously saved using the SAVE Buffers to file option to be re-loaded to the frame buffers. Type the filename as usual and press [ENTER]. Attempting to load a file of the wrong type will give a warning message 'Not a buffer file' and the operation will be cancelled.

Configuration

Selecting this option will reload a file saved using the Save Configuration option. The selected values for the RS232, SCREEN and USER menus at the time of saving will be re-instated. Specifying a file of the wrong type will give the message 'Not a configuration file'.

3.8.3 Cat

Selecting CAT will display a sub-menu from which you may choose to display a catalogue of either the frame buffers or disc/tape files.

If tape is being used the [ESC] key may be used to interrupt the operation and return to the main FILE menu. When disc is in use, [ESC] will temporarily pause the catalogue listing so that large catalogues can be read before they scroll out of the window. After reading the catalogue press any key to return to the main FILE menu.

3.8.4 Erase

Selecting this option permits individual buffers or disc files to be erased. It is not possible to erase tape files so that if tape is in use, Honeyview will assume that one of the buffers is to be erased as described below. If you have discs, a sub-menu will appear for selection of buffer or file erasure.

When erasing buffers a list of the currently loaded frames will be shown and the cursor keys may be used to select which to erase as required.

When erasing files a filename window will appear in which you may specify the file to be erased. Press [ENTER] or [ESC] to proceed with or cancel the operation appropriately. During erasure the system messages window will appear.

3.9 TELESOFTWARE : [CTRL] 3

Function key f3 does not provide access to a menu, it is simply a command key which instructs Prestel to initiate a telesoftware downloading sequence.

At the time of writing there are several new areas being created for Amstrad users that offer a variety of Telesoftware programs for downloading. Some of these programs are provided free of charge, others are commercially available and will be charged for at a specified price which will be added to your Prestel bill.

The command may only be used when you are positioned at a telesoftware header frame. Generally a message such as 'Press CTRL-3 to download' will be present on the header frame.

When TELESOFTWARE has been selected, a window will appear with the message

Searching for header ...

This means that Honeyview is looking for a special sequence of characters that make up the header frame. If the header frame cannot be found you will be instructed what to do next.

When a header has been successfully found a 'Download status' window will appear indicating the name of the program being downloaded, the total number of blocks comprising the program, the current block number, the number of retries on the current block and the amount of free room left in the download buffer.

Some programs consist of two or more separate program files. If this is the first in the sequence after selecting TELESOFTWARE then a filename window will appear with the default filename (derived from the header frame) already entered. This may be changed if necessary using the normal editing keys or accepted using [ENTER].

If a particular block is corrupted during download (perhaps due to noise on the line), Honeyview will request a repeat of the block up to a maximum of 5 times before the attempt is abandoned.

If you wish to deliberately interrupt the download sequence you should use the [ESC] key once.

After a successful download the program will be saved to a file and if there are further files in the sequence Honeyview will automatically request these as well.

After a complete download you will be asked whether you wish to 'Log off Y/N'. If you select N the program will be saved to disc and you will be returned to the last frame used. If you select Y the communications link will be broken and the program saved.

3.10 EDIT : [CTRL] 4

[CTRL] 4 puts Honeyview into EDIT mode for the purpose of creating and editing viewdata screens. Existing frames copied from Prestel can be edited or new screens can be created from scratch.

You may only switch into EDIT mode when the status indicates that you are READY rather than ON-LINE, the status line will indicate the change of mode by replacing READY with EDIT. If your cable is incorrectly wired it will not be possible to enter Edit mode unless the RS232 interface is disconnected. Refer to Appendix B for correct wiring details.

In EDIT mode, the cursor keys are used to move around the screen and alter the display using the keyboard. Also, the large [ENTER] key performs a Carriage Return without a Line-feed.

Each key on the keyboard will behave normally when used on it's own. However, pressing [ESC] once will cause Honeyview to interpret the next key as one of the standard Teletext control codes (often called attributes), used by viewdata systems. For instance, go into edit mode now and press [ESC] followed by capital A. Anything else you now type on the same line should appear in red. If you only have a green screen monitor you should notice a change in the shade of the lettering.

Other codes operate as follows :

| | | | | | |
|----------|-------------------|------|----------|---------------------|----------|
| [ESC]A - | red | text | [ESC]Q - | red | graphics |
| [ESC]B - | green | " | [ESC]R - | green | " |
| [ESC]C - | yellow | " | [ESC]S - | yellow | " |
| [ESC]D - | blue | " | [ESC]T - | blue | " |
| [ESC]E - | magenta | " | [ESC]U - | magenta | " |
| [ESC]F - | cyan | " | [ESC]V - | cyan | " |
| [ESC]G - | white | " | [ESC]W - | white | " |
| [ESC]H - | flash | | [ESC]X - | conceal | |
| [ESC]I - | steady | | [ESC]Y - | reveal | |
| [ESC]L - | end double height | | [ESC]M - | start double height | |
| [ESC] - | new background | | [ESC] \ | Black background | |

Note that any attribute is only active until it is cancelled by another attribute, or the end of the line on which it is placed. If you wish to use the same effect on other lines you must duplicated the attributes on those lines.

When colour graphics is in operation, capital letters appear normally but lower case letters and other characters generate the various mosaic graphics patterns used to build viewdata frames. These mosaics are 2 pixels wide by 3 high and can contain two colours.

The [ESC] sequences described above can also be used whilst on-line in certain situations, particularly within mailbox response frames.

3.11 READY/ON-LINE : [CTRL] 5

Pressing [CTRL] 5 whilst in either CAROUSEL or EDIT mode puts Honeyview into READY/ON-LINE mode ready to communicate with the remote viewdata host. This means that once a connection has been established with a remote viewdata system, incoming characters from the RS232 are displayed on the screen and characters entered at the keyboard are transmitted to the host via the RS232 interface.

If no RS232 interface is present Honeyview will sound the bell and the switch into ON-LINE mode will not take place.

READY/ON-LINE mode is the usual mode which will be entered when you run Honeyview with an RS232 interface connected. If no RS232 is present EDIT mode will automatically be selected.

Whilst in READY/ON-LINE mode the elapsed time clock counting hours and minutes will be displayed in the centre of the status line and the READY message will be shown at the right of the status line. When you actually connect to the remote system the READY message will change to ON-LINE to show that a data link has been established. At the same time the elapsed time clock will be reset to 00:00. The ON-LINE message will revert to READY when the link is broken, for example when you disconnect your modem. Note that for the READY/ON-LINE messages to operate properly you must ensure that the RS232 lead is correctly wired as detailed in Appendix B of this guide. Incorrect wiring may cause the ON-LINE message to appear permanently.

Note that pressing [CTRL] 5 while already ON-LINE will also reset the clock to 00:00.

3.12 CAROUSEL : [CTRL] 6

[CTRL] 6 may be used to switch Honeyview into CAROUSEL mode, either from Edit or On-line modes. The Carousel allows up to 10 Viewdata frames which are stored in the 10 frame buffers, to be redisplayed in sequence one after the other rather like a carousel slide projector.

If you attempt to enter Carousel mode when the frame buffers are empty, the bell will sound and the switch will not take place.

Whilst in Carousel mode the status line will indicate this with the message CAROUSEL. In the centre of the status line is the name of the currently displayed frame as defined when it was first saved.

To move through frames which are stored in the buffer use the up and down cursor keys. [UP-CURSOR] will display the previous frame, [DOWN-CURSOR] will display the next frame. Any empty frames will be ignored. The carousel display option can also be controlled by the use of a suitable joystick.

The FILE menu is available if you wish to save frames to disc or erase them from the buffers. If all 10 frames are erased Carousel mode will automatically be exited and you will be returned to either ON-LINE mode or EDIT mode appropriately. The PRINT menu is also available should you wish to obtain a hardcopy of a frame.

If no action is taken for 1 minute since the last frame was displayed the next will be displayed automatically. When the last frame in sequence has been displayed the first will be repeated.

The [ESC] key can be used to exit CAROUSEL mode, without losing the currently displayed frame, to either EDIT or READY/ON-LINE modes depending upon which was active prior to CAROUSEL. [CTRL] 4 and [CTRL] 6 are also available to exit to Edit or On-line modes respectively.

3.13 PRINT : [CTRL] 7

This key will allow you to obtain a text only printout of the currently displayed viewdata frame via the parallel centronics port. Printing is very fast and is useful for taking hardcopies of mailboxes and other information.

If no printer is present, or if the printer is offline, a message requesting that the printer be put online is displayed. At this point pressing [ESC] will abandon the attempt to print. Alternatively, put the printer online and press any key to continue.

If the printer should go offline for any reason for more than 20 seconds while printing, a timeout will occur and cause the print to be abandoned. If this happens you will have to start again by using [CTRL] 7.

3.14 DISC: [CTRL] 8

This menu is only available when discs are fitted. Selecting [CTRL] 8 without discs will cause the bell to sound and no action will be taken.

Four options are available under the menu :

```
DISC
  ITape
  [IDisc]
  IA
  IB
  IHT
```

which allow you to select the disc or tape filing systems, and if disc is selected, the default drive, A: or B:.

3.14.1 ITape

Selecting ITape will ensure that all future filing operations are performed using the cassette. Also, since no disc drive is being used, the status line will no longer contain the default disc drive.

3.14.2 IDisc

IDisc will reinstate the disc filing system with the drive indicator on the status line reflecting the currently selected default drive.

3.14.3 Drive selection

IA and IB will select drive A: or B: as the default drive respectively. The status line will change to reflect the selected drive.

3.14.4 IHT

This option will switch from Honeyview to Honeyterm. Note that you cannot use the option whilst on-line.

3.15 USER : [CTRL] 9

The USER menu allows you to redefine any of the 10 user function keys to contain your own character strings. These are accessed while you are online by using [SHIFT] with the appropriate numeric key. Their main use is to allow single-key transmission of logon strings/passwords and commonly used command sequences.

There are 3 options under the main USER menu :

USER KEYS

Define
[Load]
Save

3.15.1 Define

When you receive Honeyview there are 10 predefined strings :

| User Key | Default string | Use |
|-----------|----------------|--------------------------------|
| [SHIFT] 0 | - | Reserved for Customer Identity |
| [SHIFT] 1 | - | Reserved for Password |
| [SHIFT] 2 | 2 | Number 2 |
| [SHIFT] 3 | *77# | Send mailbox |
| [SHIFT] 4 | *1# | Main index |
| [SHIFT] 5 | *90# | Logoff |
| [SHIFT] 6 | 6 | Number 6 |
| [SHIFT] 7 | 7 | Number 7 |
| [SHIFT] 8 | *00 | Retransmit page |
| [SHIFT] 9 | *# | Previous page |

Selecting the define option causes a window to appear displaying each of the currently defined strings assigned to the User function keys.

As usual the cursor keys are used to move through the list of strings. Pressing [ENTER] will select the current key and clear the previously assigned string leaving the cursor at the start ready for you to type the new definition. Each string must contain at least one character and may contain a maximum of 32. Any characters available from the keyboard may be entered, including the [CTRL] codes listed below. The # key can be used to include # into a string, [DEL] deletes the last character and [CLR] will clear the entire string. Pressing [ESC] will cancel the new definition and return ready for another key to be selected.

The first two keys, f0 and f1, have special meanings within Honeyview and are used for auto-logon. f0 is expected to contain your Customer Identity number with f1 containing

your four digit password. These numbers will be transmitted automatically by Honeyview when it receives the ENQ sequence from Prestel i.e. immediately after a connection is established. If the first character of f0 is a space Honeyview will not attempt to send the string and auto-logon is disabled. Initially both keys are programmed with a single space. To put your own Identity number and password on the keys simply type them in the normal manner. Notice that each digit will be displayed as a dash (-) for security reasons once you have pressed [ENTER]. Note that if the password is not present the Customer Identity will still be sent.

The following [CTRL] codes are valid for use in User defined strings :

| | | | |
|----------|---|-----|-----------------|
| [CTRL] H | - | ^ H | Backspace |
| [CTRL] J | - | ^ J | Line feed |
| [CTRL] L | - | ^ L | Clear screen |
| [CTRL] M | - | ^ M | Carriage Return |
| [CTRL] | - | ^] | Escape |

To enter these codes type ^ followed by the appropriate letter, DO NOT use [CTRL] in conjunction with the letter as you would normally do.

After typing the new definition press the large [ENTER] key to accept it, [ESC] may be used to return to the main USER menu when all changes have been made and you have saved the definitions using the save option described in section 3.15.3 below. Alternatively, it is possible to save the User functions together with other parameters using the Save Configuration option discussed in section 3.8.

3.15.2 Load

A previously defined set of user key definitions can be reloaded with this option. A filename window will appear in which you should enter the name of the file containing the required definitions. Note that loading a file which was not originally saved from the User keys menu may have unpredictable effects.

3.15.3 Save

This option will save all ten User key definitions in a single file on disc or tape. When a filename has been given the definitions will be saved. It is good practice to end Key definition filenames with the .KEY extension to avoid confusion with other file types.

Chapter 4

Honeyterm

4.1 Introduction

Honeyterm is the ASCII terminal program which forms part of the Commstar package. It is accessed by selecting option 2 from the Commstar main menu, or by typing IHT [ENTER].

The screen will clear except for the bottom line which is used for status information. At the left hand side of the status line is an elapsed time clock which is updated every second to show hours, minutes and seconds since Honeyterm was activated.

Next to this is a space for messages indicating the [CAPS-LOCK] and [SHIFT-LOCK] status. If Caps lock is active the message 'Caps' will be displayed and similarly, if Shift lock is active the message 'Shift' will be displayed.

If you have a disc drive fitted, the next item on the line will be A: or B: to indicate the currently active drive.

At the right side of the status line there are three further status messages, one to indicate the Spool status (see 4.10), another to indicate the READY/ON-LINE status and a third to show the amount of free memory remaining. The Free memory will show as 24K initially.

As with Honeyview, various keys on the keyboard are reconfigured by Honeyterm to allow quick selection of the program's many features. In particular the function keys are used to provide access to the pop-up menus. These are described fully in section ~~2.7.1~~.

2.6.1

4.2 The RAM buffer

One of the important points to notice is the difference in the way in which memory is used by Honeyview and Honeyterm. Whereas Honeyview uses the Amstrad's free RAM space as a number of 'frame buffers' in which viewdata screens can be stored, the same RAM in Honeyterm is used as a single large buffer for all incoming data. Thus characters which are received and displayed on your screen are also copied into memory. An indication of how much memory is left is given at the right hand side of the Status line. Initially this will be 24K.

The advantage of buffering the data in this way is that data which has been received and lost from the display can still be examined later.

If the RAM buffer becomes full, the first characters received i.e those at the start of the buffer, will be overwritten by new data. In order to avoid loss of important data, you will be given a warning when the buffer is nearly full and Honeyterm will send an XOFF signal to the host in an attempt to suspend transmission. You may then proceed to save the buffer contents if necessary. When using discs, this operation may be carried out without losing new incoming data even if the host system does not respond to the XOFF. However, tape users may find that new data is lost if the host system does not respond to the XOFF signal sent by Honeyterm. When saving is complete Honeyterm will automatically issue an XON signal to enable the host to resume transmission.

Honeyterm configures several keys on the keyboard to allow data in the buffer to be reviewed in different ways. In effect, the screen acts as a window into the buffer and this window follows the incoming data. When you move the window to another part of the buffer, the word REVIEW will appear on the status line.

Whilst in REVIEW mode incoming data is still saved in the buffer but will not be shown on the screen. When the window is returned to the end of the buffer this new data will be shown.

4.3 Special keys

4.3.1 The Cursor keys

When the cursor keys are used on their own in terminal mode they will produce the normal cursor movements whilst you are on-line. In Edit mode it will be necessary to switch Echo on so that your key presses are repeated on the screen.

In addition, the up and down cursor keys when used in conjunction with [SHIFT] can be used to move the window through the buffer by one line at a time.

Pressing [SHIFT][UP-CURSOR] will move the window back through the buffer by one line, [SHIFT][DOWN-CURSOR] moves the window forward one line. If, when moving in either direction the end of the buffer is reached, the bell will sound and no movement of the window will take place.

Using the cursor keys in conjunction with [CTRL] will move the buffer window one screenful at a time instead of one line. i.e. [CTRL][DOWN-CURSOR] moves the window forward one page and [CTRL][UP-CURSOR] moves it back a page. Once again if the end of the buffer is reached the bell will sound.

4.3.2 [CTRL] [TAB]

[CTRL][TAB] is used to return quickly to the end of the buffer and exit Review mode so that incoming data is once more displayed on the screen.

4.3.3 [CTRL][CLR]

Pressing [CTRL] and [CLR] together will cause Honeyterm to transmit a 'break' level to the remote system. This is often used to interrupt a process running on the host such as Telecom Gold, One to One etc.

4.3.4 The Function keys

As with Viewdata mode, extensive use is made of the Amstrad's ten function keys, both for displaying the option menus and for programming your own key sequences.

Without [SHIFT] or [CTRL] the function keys give their normal numeric values 0-9 as expected.

With [SHIFT] the keys give access to the ten user definable strings (see Section 4.13).

When used in conjunction with [CTRL] the Honeyterm menus become available as follows:

- [CTRL] 0 - CONFIGURE terminal characteristics
- [CTRL] 1 - RS232 configuration
- [CTRL] 2 - FILE management
- [CTRL] 3 - TRANSFER files
- [CTRL] 4 - OFF-LINE mode
- [CTRL] 5 - READY/ON-LINE mode
- [CTRL] 6 - SPOOL to file/printer
- [CTRL] 7 - PRINT RAM, file or screen
- [CTRL] 8 - DISC management
- [CTRL] 9 - USER key definition

You will see that some of these correspond to those used by the viewdata program but that there are also differences. Once again, most of the keys present a menu on the screen from which you may choose one of the options using the cursor control and [ENTER] key. These operate in the same way as for the viewdata program. The others simply change the operating mode of Honeyterm. Full descriptions of the function keys are provided in the following sections.

4.4 CONFIGURE : [CTRL] 0

The CONFIGURE menu is displayed by pressing [CTRL] 0 and is entered with the pointer against the first option. There are 9 options in total which are used to set up various terminal characteristics. Most of these options can have one of two states, ON or OFF. Selecting an option simply reverses it's current state.

The following options are available :

```
CONFIGURE :  
[XON/XOFF ON]  
Auto LF OFF  
Echo OFF  
Monitor OFF  
Line Wrap 80  
Cursor UND  
Rev video OFF  
Delete 8  
CHR$(35)=
```

4.4.1 XON/XOFF

The majority of databases operate a form of flow-control known as XON/XOFF. This involves the use of two special characters that are used to either temporarily halt transmission or to restart it.

If a receiving system has to carry out some background task such as saving on to disc data that has already been received, it may not be able to handle incoming data at the same time. If XON/XOFF protocols are in use it would simply transmit the XOFF character to the sender which in turn would cease transmission. When the receiver has completed the background task it would transmit an XON character to tell the sender to resume.

Even if XON/XOFF is switched OFF you may use it manually whilst online by simply typing [CTRL] S (the XOFF character) or [CTRL] Q (XON), as required.

When XOFF is sent, either manually or by Honeyterm, the message HALT appears on the status line to warn you that transmission is now halted. This message is removed when transmission resumes.

4.4.2 Auto LF

Most databases send a Linefeed character following every Carriage Return so that data is displayed correctly on the screen of the receiving terminal. There are some systems however, that send only Carriage Returns, in which case it will be necessary to switch Honeyterm's Auto Linefeed option ON so that screen formatting is correct.

4.4.3 Echo

Whilst online to most databases, any characters that you type are 'echoed' back to you so that they appear on your screen and you can see what you have typed. When using systems that do not provide echo you should switch Honeyterm's Echo option ON so that Honeyterm sends copies of your typing to the screen as well as to the RS232.

4.4.4 Monitor

When the Monitor option is OFF all control codes received by Honeyterm will be acted upon, for example, a received [CTRL] L character will clear the screen, a [CTRL] G will sound the Bell etc. Switching Monitor ON causes incoming control codes to be printed as inverse characters and not acted upon so that a received [CTRL] G will appear as an inverse 'G' on your screen. This facility can be very useful when testing or examining what control codes are being transmitted by a database.

4.4.5 Line Wrap

In general a database will send a Carriage Return/Linefeed at the end of each line. However, if a remote system uses a line length less than 80 characters and does not provide Linefeeds the display of incoming data will be adversely affected. The Line Wrap function allows you to set the width of your screen to either 40, 48, 56, 64, 72 or 80 characters so that you can correct this situation if it occurs.

4.4.6 Rev video

In certain situations screen displays may be easier to read if the foreground and background colours are reversed. This option simply switches the paper and ink colours.

4.4.7 Cursor

The shape of the cursor can either be a flashing underline (UND) or block character (BLK) as selected by this option.

4.4.8 Delete

There are two ASCII characters which can be used to mean 'delete'. The standard is ASCII 127 which performs the dual operation of backspacing and deleting. The lesser used character is ASCII 8 which normally only backspaces i.e. it moves the cursor back one place but does not delete. If you find that the delete key does not operate as it should, you can toggle the Delete character used between 127 and 8 by using this option.

4.4.9 CHR\$(35)=

This allows the ASCII character 35, to be reconfigured as either the Pound (£) or Hash (#) symbols as necessary.

4.5 RS232 : [CTRL] 1

The RS232 key operates in the same manner as for the Viewdata program to allow simple configuration of the RS232 interface.

A main menu shows all seven options with their currently selected values. Pressing [ESC] at this point will exit the menu without making any changes.

```
RS232 :  
[TX baud 300    ]  
RX baud =TX  
Parity None  
Data bits 8  
Stop bits 1  
Handshake SOFT  
Par check ON
```

4.5.1 TX baud

TX baud (transmit baud rate) is selected initially and pressing [ENTER] will allow you to change the current value. In terminal mode this will be set to 300 baud by default. Other possible values are 75, 150, 600, 1200, 2400, 4800, 9600. It will only be possible to use some of these rates when transferring data by direct connection to another computer i.e. by linking the two RS232 interfaces directly together. When using a modem only those rates which are supported by that modem can be used.

4.5.2 RX baud

Pressing [DOWN-CURSOR] once will select receive baud rate which is by default set to =TX i.e. it is normally the same as the transmit baud rate. Press [ENTER] and use the cursor keys if you wish to change this for use with split baud rate systems such as PSS 1200/75 ports. The same range of receive rates are available as listed under Transmit baud above with the addition of the =TX option.

4.5.3 Parity

The parity bit is an extra bit which is added to the data to provide a simple form of error check. If the parity of received data is not the same as expected, a 'Parity Error' will be generated by the RS232 interface. Normally this will result in incoming data appearing corrupted and if the sender is using a different parity from the receiver most characters will be affected.

The parity used may be either Even, Odd or None. It is normally None for use with bulletin boards or Even for Telecom Gold and similar systems.

4.5.4 Data bits

The number of data bits used may be either 7 or 8 and is normally 8 for bulletin boards. Telecom Gold and similar systems use 7.

4.5.5 Stop bits

Most bulletin boards use only 1 stop bit for data but options are available for 1, 1.5 and 2 stop bits. Telecom Gold uses 2 stop bits.

Once you have selected the appropriate values for the RS232 options press [ESC] to exit from the main menu back to the current operating mode. Remember that in most cases you will not have to alter the default settings used by Honeyterm, they have been chosen to suit the most common requirements.

4.5.6 Handshake

The RS232 serial interface specification includes facility for hardware 'handshaking' to control the flow of data and prevent overrun. This involves the use of certain control lines such as CTS (Clear to Send), RTS (Request to Send) and DTR (Data Terminal Ready). How these lines are used depends upon the communications software that you are running and it is quite possible to transfer data without using them at all, the only difference being that data could be lost at higher speeds due to overrun. Hardware handshaking ensures that this does not occur. The alternative to hardware handshaking is to use software flow control such as XON/XOFF. Whether or not you use hardware handshaking depends upon the type of interface on your modem. Some modems may not provide connections for signals such as CTS and therefore preclude the use of hardware handshaking.

4.5.7 Par check

It has been found that some systems actually change the type of parity used during an online session and unless you are aware of the change it is very difficult to correct the situation and you will suddenly start receiving garbage. Switching Par Check OFF will cause Honeyterm to ignore the parity of incoming data. This means that changes of parity by the host will not affect your display. Remember however genuine corruption of data may not reveal itself as it would with parity checking ON.

4.6 FILE : [CTRL] 2

The FILE key allows access to 4 options for file and RAM buffer management :

```
FILE :  
[Save  ]  
Load  
Cat  
Erase
```

4.6.1 Save

This Save option is the first in the list and presents a further menu :

```
SAVE :  
[Buffer      ]  
Configuration
```

The save buffer option allows the contents of the RAM buffer to be saved to a disc or tape file and pressing [ENTER] will cause a window to appear requesting the name of the file into which the data should be saved. During the saving the system messages window will appear to display the usual messages. When saving is complete press any key to continue.

The Save Configuration option will store all the currently selected values from the CONFIGURATION, RS232 and USER menus into a file of your choice. This file can then be reloaded later and used to set up Honeyterm to use those values.

Note that the Save option is not operational when SPOOLING to FILE is active (See 4.10.1).

4.6.2 Load

The load option can be used to retrieve a previously saved file from disc or tape and place its contents in the RAM buffer or to re-load a set of configuration values.

A further menu will appear :

```
LOAD :  
[Buffer      ]  
Configuration
```

Selecting either option will display a window requesting the name of the file to be loaded. Loading the buffer will open the specified file and copy its contents into memory.

Loading a configuration file will read the saved values and configure the CONFIGURE, RS232 and User options appropriately.

During loading the system messages window will display the usual messages. When loading is complete, press any key to return to the file menu and [ESC] to go back online. You will then see the last page of the file displayed on the screen. The usual [CTRL] and [SHIFT] cursor commands may then be used to review the file.

4.6.3 Cat

Selecting CAT will display a list of the files on the currently loaded disc or tape. If tape is being used the [ESC] key may be used to interrupt the operation and return to the main FILE menu. When discs are in use, [ESC] will temporarily pause the catalogue listing so that large catalogues can be read before they scroll out of the window. After reading the catalogue press any key to return to the main FILE menu.

4.6.4 Erase

Selecting this option permits the buffer contents or individual disc files to be erased. It is not possible to erase tape files so that if tape is in use, Honeyterm will assume that the buffer is to be erased. If you have discs, a sub-menu will appear for selection of buffer or file erasure.

When erasing the buffer the System messages window will appear to request confirmation that the buffer be erased. Note that there will be no apparent effect until you press [ESC] to exit back to ON-LINE mode at which point any displayed data will disappear.

When erasing files a filename window will appear requesting the relevant filename. You may either enter the filename or press [ESC] to proceed with or cancel the operation respectively. During erasure the system messages window will appear.

4.7 TRANSFER : [CTRL] 3

The transfer key is used to initiate the transfer of complete files between the Amstrad and other computers. Pressing [CTRL] 3 will display a menu with two options :

```
TRANSFER :  
[ASCII   ]  
XMODEM
```

Simple ASCII transfer relies on XON/XOFF flow control and will only allow the transfer of pure ASCII files. It will not transfer machine code or BASIC programs or data files. It is normally used for the transfer of ASCII files to systems which are incapable of using XMODEM. Most systems that you are likely to use will have the equivalent type of transfer but it is important to note that sending or receiving files this way does not provide any error checking of the file contents. Any noise on the line during the transfer is therefore likely to cause corruption of the data.

XMODEM is a more sophisticated protocol that incorporates comprehensive error detection and correction techniques. XMODEM transfer can be used to transfer data to or from many bulletin boards which also have XMODEM capability, or to another Honeyterm user. Using XMODEM any type of file can be transferred including ASCII files, machine code and BASIC programs.

Once you have selected the appropriate protocol, a sub-menu will be displayed offering the choice of either Sending or Receiving a file. All that is then necessary is to enter the name of the file to be transferred. Pressing [ESC] at this stage will abort the transfer before the file has been accessed.

During the transfer a system message window will appear to show various status messages that will occur.

4.7.1 ASCII Send

When sending a file using the standard ASCII format the message :

Sending...

will be shown in the system messages window and the data will be sent to the RS232 port. The end of the data is signified by a [CTRL] Z character which is appended to Amstrad text files by Amsdos.

4.7.2 ASCII Receive

The message :

Receiving...

will be displayed in the system messages window along with a count of the incoming

characters which will be stored in the specified file until an End of File character ([CTRL] Z) is received.

When receiving files from systems which do not use [CTRL] Z for file termination, wait until the character count stops and then use [ESC] to terminate. You will get the message 'Transfer aborted' but the file will actually be saved correctly. Alternatively, request the sender to type [CTRL]Z on their keyboard when transmission of the file itself is complete.

The transfer can be abandoned at any time by pressing the [ESC] key.

4.7.3 XMODEM Send

After entering the filename the specified file will be opened and the message :

Awaiting synchronisation

is displayed in the system messages window. This signifies that Honeyterm is waiting to detect that a receiver is trying to receive the file.

If after a period of time no receiver is found an appropriate message will be displayed and the transfer attempt will be abandoned.

If a receiver is correctly acknowledged the transfer will proceed and the message :

Sending...

Block: 1 Retries: 0

will be displayed. The actual data is transferred in blocks and as each block is sent the block counter is updated. If an error is detected by the receiver in any block Honeyterm will re-transmit the block in question and the Retry counter will be updated. If more than 10 re-tries are required for a particular block the transfer will be abandoned and you will have to start again. If this does occur it is usually a sign of poor line conditions and you should disconnect and redial before trying again.

4.7.4 XMODEM receive

Once the file has been opened the message :

Receiving...

Block: 0 Retries: 0

will be displayed. As each block is received the block counter is updated and Honeyterm will check for errors. If errors are detected in the block Honeyterm will request the sender to re-transmit it and the retry counter will be updated. If more than 10 re-tries are necessary the transfer will be abandoned. When the transfer has been successfully completed you will be returned to ON-LINE mode.

If you wish to abandon the transfer press [ESC].

4.7.5 Transferring Binary files

The file header information used in a file catalogue cannot be transferred with the data when using XMODEM. This means that the correct catalogue information for binary files (with the extension .BIN), must be re-created after the transfer. For example, if you wish to transfer the file "HELLO.BIN" which has an execution address of &4000, a load address of &4000 and a length of &100 bytes, use XMODEM as normal and then give the receiver the correct catalogue information. He should then save the file as HELLO.BIN and exit Honeyterm. The file header may then be recreated using the following statements:

```
MEMORY &3FFF  
LOAD "HELLO.BIN",&4000  
SAVE "HELLO.BIN",B,&4000,&100
```

4.7.6 File transfer at 1200 baud

Modems which are capable of operating at 1200 baud in full duplex are still fairly expensive. However, it is possible to transfer files between two Honeyterm systems at 1200 baud providing that the modems used are capable of operating at both 1200/75 and 75/1200 baud rates.

The procedure to do this is simple. The sender configures both Honeyterm and his modem to send at 1200 baud and receive at 75 baud. The receiver does the opposite i.e. configures both Honeyterm and his modem to receive at 1200 baud and send at 75. This means that the bulk of the data i.e. the file being sent, is transmitted at 1200 baud, only the acknowledgements (when using XMODEM) travel at 75 baud. The result is a very much faster transfer than at 300 baud.

To send files in the other direction simply reverse the baud rates.

4.8 OFF-LINE : [CTRL] 4

Pressing [CTRL] 4 will cause Honeyterm to relinquish control of the modem by dropping RTS and therefore drop the line to any host to which you have been connected.

The buffer contents may still be reviewed or printed but data is not sent to the RS232 interface and any incoming data will be ignored.

OFF-LINE mode may in fact be used to prepare messages whilst offline. To do this ensure that the Echo option is ON at the CONFIGURE menu and then go OFF-LINE. Whatever you type will then be copied into the buffer, including cursor movements. For this reason, text on a particular line may only be edited using the [DEL] key and retyping until you have pressed [ENTER]. You cannot edit text on previous lines by moving around with the cursor as the receiving system may not accept the cursor control codes. Messages created in this way can be saved to disc or tape using the Save Buffer option. To transmit the message to a system such as Telecom Gold you would simply log on and at the appropriate point use the ASCII option from the TRANSFER menu to send the file.

4.9 READY/ON-LINE : [CTRL] 5

The READY/ON-LINE key is used to put Honeyterm into a state in which it is ready to communicate with a host system such as Telecom Gold. When a connection is established, incoming data is displayed on the screen and characters entered at the keyboard are sent to the host. The message READY will be displayed on the status line until a connection is established when it will change to ON-LINE.

If no RS232 interface is present, Honeyterm will sound a warning bell and the switch into online mode will not take place.

Whilst online the elapsed time clock counting hours, minutes and seconds will be displayed on the status line and the READY or ON-LINE message will be shown depending upon whether or not you are connected to a remote host. Pressing [CTRL] 5 whilst already online will simply reset the clock to 00:00:00.

4.10 SPOOL : [CTRL] 6

Normally all incoming data is copied directly into the RAM buffer. However, it is sometimes desirable to keep a copy of the data on disc as well, or to keep a hardcopy from the printer. When [CTRL] 6 is pressed the SPOOL menu will be displayed :

```
SPOOL :  
[RAM   ]  
File  
Printer
```

with the three options shown above. Normally the SPOOL option is RAM so that incoming data is only stored in memory.

4.10.1 File

If the file option is selected you will be asked to enter the name of the file in which the data is to be stored. This file will then be opened and you will be returned to ON-LINE mode.

If the current filing system is Disc, spooling will stop automatically when the disc becomes full.

4.10.2 Printer

Selecting Printer causes a hardcopy of all data to be produced as it is received. As this generally slows down the speed of data transfer it is recommended that data is first spooled to a file and then printed while offline.

4.11 PRINT : [CTRL] 7

The PRINT key allows a hardcopy of data to be obtained from one of three sources: the currently displayed screen, the RAM buffer or a previously saved file. The parallel Centronics port is used for printing.

PRINT :

[Screen]

Buffer

File

When the type of print required has been selected the system messages window will be displayed and printing will proceed.

If there is no printer attached or if the printer is offline a message will be displayed requesting the printer to be placed online. If you wish to abandon the print at this stage or whilst printing is in progress press [ESC].

If the printer goes offline during printing for more than ten seconds a timeout will occur causing the operation to be abandoned. If this happens the print will have to be re-started using [CTRL] 7.

When a print is successfully finished the message window is removed and the original screen will be restored.

4.11.1 Screen

When the screen option is selected the entire contents of the screen will be sent to the printer with the exception of the status line or any windows.

4.11.2 Buffer

With this option the entire contents of the RAM buffer will be printed.

4.11.3 File

Selecting this option causes a window to appear in which the name of the file to be printed should be entered. The file specified must only contain ASCII data or the results will be unpredictable. The option is generally intended for obtaining hardcopies of previously spooled files.

4.12 DISC : [CTRL] 8

This key is only operational when discs are fitted. Pressing [CTRL] 8 without discs will cause the bell to sound and no action will be taken.

Five options are available under the main menu :

```
DISC :  
  |Tape  
[ |Disc]  
  |A  
  |B  
  |HV
```

which allow you to select the disc or tape filing systems, and if disc is selected, the default drive, A: or B:.

4.12.1 Tape

Selecting |Tape will ensure that all future filing operations are performed using the cassette. Also, since no disc drive is being used, the status line will no longer contain the default disc drive.

4.12.2 | Disc

| Disc will reinstate the disc filing system with the drive indicator on the status line reflecting the currently selected drive.

4.12.3 Drive selection

|A and |B will select drive A: or B: as the default drive respectively. The status line will change to reflect the selected drive.

4.12.4 | HV

This option will switch from Honeyterm to Honeyview. Note that you cannot use the option whilst on-line.

4.13 USER : [CTRL] 9

The USER key presents a menu which allows you to program any of the ten function keys with your own logon strings, passwords or even command strings for intelligent modems etc. These strings can be transmitted with a single keypress whilst you are ON-LINE by using [SHIFT] with the appropriate numeric key, and do not affect the normal definitions set up by Honeyterm.

There are 3 options under the main USER menu :

```
USER:
Define
[Load  ]
Save
```

4.13.1 Define

When you receive Honeyterm there are 10 predefined strings which are simply the normal numeric values of the keys :

| User Key | Default string | Use |
|-----------|----------------|----------|
| [SHIFT] 0 | 0 | Number 0 |
| [SHIFT] 1 | 1 | 1 |
| [SHIFT] 2 | 2 | 2 |
| [SHIFT] 3 | 3 | 3 |
| [SHIFT] 4 | 4 | 4 |
| [SHIFT] 5 | 5 | 5 |
| [SHIFT] 6 | 6 | 6 |
| [SHIFT] 7 | 7 | 7 |
| [SHIFT] 8 | 8 | 8 |
| [SHIFT] 9 | 9 | 9 |

Selecting the define option causes a window to appear displaying each of the currently defined strings assigned to the User function keys.

Initially the first option will be selected and as usual the cursor keys are used to move through the options. [ENTER] selects the ticked option and clears the assigned string leaving the cursor at the beginning of the string entry ready for you to type the new definition. Each string must contain at least one character and may contain a maximum of 32. Any characters available from the keyboard may be entered, including the [CTRL] codes listed below. [DEL] deletes the last character and [CLR] will clear the entire string. Pressing [ESC] will cancel the new definition leaving the previous one intact, and return to the menu ready for another key to be selected.

The following [CTRL] codes are valid for use in User defined strings :

| | | |
|----------|-----|-----------------|
| [CTRL] H | -^H | Backspace |
| [CTRL] J | -^J | Line feed |
| [CTRL] L | -^L | Clear screen |
| [CTRL] M | -^M | Carriage Return |
| [CTRL]] | -^] | Escape |

To enter these codes type ^ followed by the appropriate letter, do not use [CTRL] in conjunction with the letter as you would normally do.

As an example, to log on to a remote information service via PSS you will need to enter your PSS NUI (Network User Identity) and your NUA (Network User Address). If these were NTLGOLD123ABC and A21900011456 respectively, you could program each of them on to a function key with the following :

```
f1 NTLGOLD123ABC^M
f2 A21900011456^M
```

The ^M pair at the end of the string generates the Carriage Return that is required, so that to send the strings you would simply type [CTRL] 1 and [CTRL] 2 at the appropriate prompts.

After entering all the definitions that you require press the large [ENTER] key to accept it, [ESC] may be used to return to the main USER menu when all the changes have been made. Remember that if you wish to use the same key definitions in future you must use the Save option described below before you switch off your machine.

4.13.2 Load

A previously defined set of user key definitions can be reloaded with this option. A filename window will appear in which you should enter the name of the file containing the required definitions. Note that Honeyterm will not allow you to load a file that was not originally saved using the Save option described below.

4.13.3 Save

This option will save all ten User key definitions in a single file on disc or tape. When a filename has been given the definitions will be saved. It is good practice to end Key definition file names with the .KEY extension to avoid confusion with other file types.

Chapter 5

Switching ROMs OFF

5.1 I ROMON

Commstar is contained in an EPROM within the RS232 interface box and is accessed using 'bar' type commands. The programs in the ROM are 'paged' into memory when required and when not in use the address space they occupy is free for use by other software. However, about 80 bytes of RAM workspace is used by Commstar even when it is not loaded, to store variables, flags etc. It is therefore necessary to be able to switch ROMs off completely so as to free this workspace for those programs which require it.

The command **I ROMON** followed by a list of ROM addresses is provided for this purpose.

For example, **I ROMON** without parameters will restart the default foreground ROM, which is normally Basic, with the full amount of memory. Other ROMs are effectively switched OFF and are not allocated any memory.

If one or more ROM addresses are specified then all of those ROMs will be initialised and allocated workspace should they need it.

Using **I ROMON,7** will switch OFF all ROM's except Basic and the disc expansion ROM.

Commstar occupies slots 1 and 2 so that **I ROMON, 1, 2, 7** would initialise Commstar, Basic and the disc expansion Rom whilst disabling all other Roms.

Chapter 6

The Bar commands

6.1 Introduction

Many of the functions available within Honeyterm have also been made accessible for use in Basic programs in the form of Bar commands i.e. commands preceded by `!`. These commands which are used to control the RS232 from within BASIC so that you can create specialist communications applications.

Commands are provided for control of the RS232 link and for serial character transfer on an individual or multiple basis. All of the command names are prefixed by `'C'` so that they are easily recognised as Commstar/Honeyterm commands.

You should be aware that a good degree of programming ability may be necessary before you can use these commands competently. Most communications requirements are catered for within the Commstar programs and you should only need the bar commands for specialist applications.

6.2 Command parameters

Most commands require one or more parameters so that information can be passed between them and Basic, the notation used throughout this documentation to identify parameters is as follows :

The angled brackets `<>` indicate a parameter. Where more than one parameter is used they are separated in a list by commas. The name within the brackets is the name of the parameter e.g. `<parameter1>`.

Square brackets `[]` indicate that a parameter is optional and may be omitted e.g. `[<optional>]`

Where a parameter must be an integer, Basic variables may be used and must be suffixed by a `%` symbol e.g. `<char>%`.

Where the address of a variable must be passed, an `@` symbol is used before the parameter. For example, `@<char>%`. The variable must have previously been assigned a dummy value, otherwise Basic will flag an improper argument error. This type of variable is used to pass information back into a basic program.

Two methods of passing the string variables necessary for `<string>` or `<filename>` use are possible depending upon which version of Locomotive Basic you are using. The CPC464 uses Basic 1.0, the CPC664 and CPC6128 use Basic 1.1.

For Basic 1.0 the parameter `<string>` or `<filename>` should be the address of a string as given by the `@` symbol, for example :

```
a$="This is a string for Basic 1.0"
```

```
! CWRITE @a$
```

This same method may be used with Basic 1.1 or, alternatively the string may be given as a constant in the external command :

```
! CWRITE, "This is a string for Basic 1.1 only"
```

6.3 Bar Command Summary

All of the external bar commands available to Basic programs are summarised here in alphabetical order. Full descriptions of each command are given in the next section.

IBREAK, <duration>
ICLOSE
ICOUNT, @<count>%
ICERROR, @<error>%
ICGET, @<char>%
ICNULL, <nulls>
ICOPEN [,<baud> [,<flow> [,<databits> [,<parity>
[,<stopbits> [,<rxbaud>]]]]]]
ICPRINT, <device>
ICPUT, <char>
ICREAD, <string>
ICSTATUS, @<status>%
ICTIMEOUT, <time>
ICWRITE, <string>

6.3.1 CBREAK

Use :

To initiate a line 'break' for an integral number of milliseconds (ms).

Syntax :

I CBREAK, <duration>

Operation :

The integer parameter <duration>, in the range 0..65535 specifies the duration in milliseconds of which the line break is to persist. A duration of 0 mS will not generate a break.

The command will wait for any remaining characters to be sent before initiating the break and may abort if the timeout limit is reached before these characters have been sent.

6.3.2 CCLOSE

Use :

To close the RS232 channel.

Syntax :

!CCLOSE

Operation :

The command will wait for any remaining characters to be sent before setting both RTS and DTR false. If a timeout occurs then the channel will not be closed and a timeout error will be given.

Note that using this command when the RS232 channel has not been previously opened will have no effect and will not generate an error.

6.3.3 CCOUNT

Use :

To obtain the number of characters transferred by the last I CNULL, I CREAD or I CWRITE command.

Syntax :

I CCOUNT, @·count·%

Operation :

The parameter ·count·% should be a predeclared integer variable into which the count will be returned. The count may be in the range 0-65535. The count is reset to 0 after having been read.

If an error occurred during the operation of either I CNULL I CREAD or I CWRITE, then the count returned will be the number of characters successfully transferred before the error.

6.3.4 CERROR

Use :

Returns the error code for the last command used.

Syntax :

I CERROR, @error%

Operation :

The parameter <error>% should be a predeclared integer variable into which the error code will be returned. If the parameter is omitted then the command will be ignored. The error code is reset to 0 after reading, the codes used and their meanings are listed in the table below :

| CODE | INTERPRETATION |
|------|---------------------------------------|
| 0 | No error |
| 1 | Too few parameters given |
| 2 | Too many parameters given |
| 4 | Timeout |
| 5 | Invalid parameter |
| 6 | Line break received |
| 7 | Framing error detected |
| 8 | Receiver overrun detected |
| 9 | Received parity error |
| 10 | Channel not open |
| 11 | Invalid baud rate specified |
| 12 | Invalid flow control type specified |
| 13 | Invalid number of data bits specified |
| 14 | Invalid parity specified |
| 15 | Invalid number of stop bits specified |

6.3.5 CGET

Use:

To receive a single byte from the RS232 channel

Syntax:

```
| CGET, @char.%
```

Operation:

The parameter <char.%> should be a previously declared integer variable into which the received character is to be returned. The received character will always be in the range 0..255. The timeout count set with the CTIMEOUT command is used.

Notes:

Attempting to receive from an unopened channel will result in a 'channel unopened' error.

If no handshaking is used then the command will wait for a character until the timeout occurs. When hardware handshaking is active then DTR will be set true if there is no character immediately available. The command will then wait until a character is received or a timeout occurs. To enable the receiver the DCD input should be true.

6.3.6 CNULL

Use :

To transmit an integral number of ASCII NULL (00H) characters.

Syntax :

I CNULL, <nulls>

Operation :

The integer parameter <nulls> in the range 0..255 specifies the number of NULLs to be transmitted and is truncated MOD 256. The command will wait for any remaining characters to be sent before sending the NULLs and may abort if the timeout limit is reached whilst waiting. If an error occurs the number of NULLs successfully sent can be determined using CCOUNT.

Notes :

Attempting to transmit when the channel is not open will result in a channel unopened error and no NULLs will be sent. Each NULL character is sent in the same manner as used in the I CPUT command.

6.3.7 COPEN

Use :

To open the serial channel by setting the baud rate, stop bits, flow control type and parity. No data can be sent or received unless the channel has been opened using this command.

Syntax :

```
I COPEN [,<baudrate> [,<flow> [,<databits> [,<parity>
[,<stopbits> [,<rxbaud>]]]]]]
```

Operation :

The command remembers previous values of parameters and these will be used if the parameters in the command line are omitted. If no previous parameters have been specified then the following defaults will be assumed :

| | | |
|------------|---|--------------------------------|
| <baudrate> | = | 9600 baud |
| <flow> | = | 1 (hardware CTS DCD RTS & DTR) |
| <databits> | = | 8 |
| <parity> | = | 0 (disabled) |
| <stopbits> | = | 1 |
| <rxbaud> | = | 9600 baud |

Each parameter given is checked and if valid replaces the previously stored value. Only if all parameters are valid is the channel opened.

The baudrate is selected from the following :

| | | | | | | | | |
|------|------|------|------|------|------|------|-----|-----|
| 9600 | 7200 | 4800 | 3600 | 2400 | 1800 | 1200 | 600 | 300 |
| 200 | 150 | 110 | 75 | 50 | 45 | | | |

The <baudrate> parameter is used to set the transmit baud rate but if the <rxbaud> parameter is omitted then the <baudrate> parameter will also be used to set the receive rate.

The modes of flow control or handshaking may be set with the integer parameter <flow>. Valid modes are :

| | | |
|--------|---|--|
| <flow> | = | 0, No handshaking |
| | = | 1, Hardware control with CTS, DCD, RTS and DTR |

If mode 1 is used then RTS will be set to true. If mode 0 is used then the hardware signals DTR and RTS will be permanently enabled and the signals DCD and CTS will be ignored.

The integer parameter `<databits>` selects the required number of data bits for each character to be sent and received in the range 5..8.

The type of parity to be applied to transmitted data, and checked for on received data is set with the integer parameter `<parity>`. For transmitted characters the extra parity bit is sent after the data bits.

`<parity>` = 0, No parity generated or checked
= 1, ODD parity generated and checked
= 2, EVEN parity generated and checked

The integer parameter `<stopbits>` specifies the number of stop bits to be sent after the data and parity bits.

`<stopbits>` = 0, 1 stop bits sent
= 1, 1.5 stop bits sent
= 2, 2 stop bits sent

The receiver will require at least 1 stop bit.

Re-opening the channel when it is already open will simply change the parameters.

6.3.8 CPRINT

Use :

To select the serial channel for printer output.

Syntax :

```
I CPRINT, <device>
```

Operation :

The integer parameter <device> selects the printer device which is to be used :

```
<device> = 0, NULL, discard output  
          = 1, Amstrad 7 bit Centronics port  
          = 2, RS232 channel
```

The NULL device simply discards all characters printed. The Amstrad 7 bit Centronics device is the standard printer port. The RS232 is used to print information to a serial printer, characters will be output using the full 8 bits.

Once the <device> has been selected all output to stream 8 will be sent to it.

Notes :

Attempting to print from an unopened channel will result in a 'channel unopened' error and no data will be sent.

Individual characters are sent in the same manner as with I CPUT.

Any errors on the serial port will appear to Basic as a timeout and will therefore cause the character to be retried for printing. The current value of timeout is used.

6.3.9 CPUT

Use :

To transmit a single byte to the serial channel using the current handshake mode and timeout.

Syntax :

I CPUT, <char>

Operation :

The parameter <char> is the integer byte in the range 0..255 to be output. It is taken MOD 256 to ensure that it is within the correct range. The current timeout as set with I CTIMEOUT.

Notes :

Attempting to transmit when the channel is not open will result in a 'channel unopened' error and the byte will not be sent.

If no handshaking is being used the character will be sent immediately.

If hardware handshaking is active the command will wait for the CTS input to go true before sending the character, or until a timeout occurs.

6.3.10 CREAD

Use :

To receive a string from the serial interface.

Syntax :

```
ICREAD, <string>
```

Operation :

The parameter <string> should be the address of a predeclared string variable. Characters will be read into the string up to the predeclared length of the string or until a Carriage Return is received. The number of characters successfully input can be obtained using ICCOUNT.

Notes :

The Carriage Return is not stored as part of the string.

Attempting to receive when the channel is not open will result in an 'unopened channel' error and no characters will be received. Individual characters are received in the same manner as with ICGET and the current timeout is used.

6.3.11 CREPORT

Use :

To allow errors to be reported as soon as they are encountered.

Syntax :

I CREPORT, <state>

Operation :

The parameter <state> disables or enables error messages :

<state> = 0, disable messages
 = 1, enable messages

Reporting is disabled by default. When enabled, any error immediately causes a message to be printed on the screen. The format of the message will be :

SIO Error: nn
<error message>

where nn is the error number which is followed by the error message text on the next line. A list of possible errors and their causes are given in Appendix D.

6.3.12 CSTATUS

Use :

To obtain the hardware status of the serial interface.

Syntax :

```
I CSTATUS, @<status>%
```

Operation :

The parameter <status>% should be a previously declared integer variable into which the serial port status is to be returned. The status is returned as a bit significant integer whose bits should be interpreted as follows :

| Bit 15 (msb) | 0 |
|--------------|------------------------|
| 14 | Framing error |
| 13 | Receiver overrun |
| 12 | Parity error |
| 11 | RTS |
| 10 | DTR |
| 9 | 0 |
| 8 | All sent |
| 7 | Break received |
| 6 | 0 |
| 5 | CTS |
| 4 | 0 |
| 3 | DCD |
| 2 | TX data register empty |
| 1 | 0 |
| 0 | RX data available |

All bits are active high i.e. Binary 1 = true

Notes :

This command will reset the RS232 error status flags and may therefore cause a following command to incorrectly interpret an error condition.

6.3.13 CTIMEOUT

Use:

To set the SIO timeout period.

Syntax:

I CTIMEOUT, <time>

Operation:

The integer parameter <time> specifies the time limit, in units of milliseconds (mS), after which a command will stop trying to send or receive a character. If <time> is 65535, its largest possible value, then the timeout period is infinite and no timeout will occur.

The following minimum values of <time> are recommended for the various handshake modes:

| | | |
|----------|---|--------------------------|
| None | : | 0 |
| Hardware | : | 1 whole character period |

Notes:

The default timeout period is 1000mS corresponding to 1 second and this has been found suitable for most applications.

6.3.14 CWRITE

Use:

To transmit a string.

Syntax:

```
I CWRITE, <string>
```

Operation:

The parameter <string> should be a reference to a predeclared string variable. Characters from the string will be transmitted until the end of the string is reached or a timeout occurs. The actual number of characters sent can be obtained using I CCOUNT.

Notes:

Attempting to transmit when the channel has not been opened will result in an 'unopened channel' error.

6.4 Example Programs

The following programs are provided as examples to show the use of some of the commands and can be adapted to suit particular applications.

6.4.1 Terminal emulator

This is a simple terminal emulation program written in Basic. It simply reads characters from the RS232 and displays them on the screen whilst reading characters from the keyboard and transmitting them via the RS232.

```
10 I COPEN,300,1,8,0,1           'open serial port
20 I CTIMEOUT,0                 'don't wait for characters
30 MODE 2                       '80 columns
40 a%=0:b%=0                    'initialise variables
50 WHILE -1                     'repeat forever
60 I CGET,@a%                   'get character
70 I CERROR,@b%                 'check for error
80 IF b%=0 THEN ?CHR$(a%);      'if ok print it
90 a$=INKEY$                    'read keyboard
100 IF a$<>"" THEN I CPUT,ASC(a$) 'if ok send it
110 WEND                        'and try again
```

6.4.2 Receiving a string

This section of program shows how the I CCOUNT command is used in conjunction with the string transfer commands to receive and correctly print a string. The serial channel must previously have been opened using the I COPEN command.

```
200 a$=STRING$(80,101)
210 a%=0
220 WHILE -1                     'repeat forever
230 I CREAD,@a$                 'read a string
240 I CCOUNT,@a%              'determine length
250 IF a%>0 THEN PRINT LEFT$(a$,a%) 'print it
260 WEND                        'and try again
```

Appendix A

Glossary of terms

Acoustic modem

An acoustic modem is a modem which has two flexible cups into which a telephone handset can be pushed to provide a coupling between the modem and the telephone line. One of the cups contains a microphone and the other contains a speaker. Data can then be passed between the modem and the telephone system via a normal telephone handset. This method of coupling lacks reliability due to the interference which may be caused by environmental noise penetrating the cups. Data may be lost or corrupted due to this.

Auto-answer modem

Some types of direct-coupled modem are capable of automatically answering a dialled-in call and setting up the data link. This is referred to as auto-answer. Modems of this type are essential for host systems such as bulletin boards which are left unattended.

Auto-dial modem

A type of direct-coupled modem which is capable of dialling a telephone number under the control of the computer to which it is connected.

Baud rate

The baud rate is an indication of the rate at which data is passed between two communicating devices, the higher the baud rate, the faster the data transfer. An N baud line is one in which the signal level can change N times per second. In most cases there are only two possible signal levels representing binary 1 and 0. In this case the bit rate is the same as the baud rate. If then, the word length is 10 bits, each word representing one character, then a 300 baud line is capable of transferring 30 characters per second ie $300/10$

Bulletin board

A bulletin board is a 'service', usually set up on a micro-computer, that accepts calls via an auto-answer modem. The software that runs the system is generally left unattended and controls access to the facilities that the computer provides. Thus, users may be able to pass messages to each other, download software or even ask the advice of other users.

Communications software

This term is generally used to describe software that allows a micro or other computer to emulate a terminal device. More intelligent communications packages provide facilities, such as selective storage of incoming data or automatic dialling of telephone numbers for use with auto-dial modems, which may not be available on 'dumb' terminals.

Direct connect modem

A type of modem that connects directly into the telephone line via an isolation transformer. These are more reliable than modems of the acoustic type because they are unaffected by environmental noise.

Downloading

The term used to describe the process of transferring data or programs between a user and a host system, via the telephone line.

Host system

A computer which accepts communications from other remote computers or terminals via a suitable transmission medium, usually the public telephone network.

Modem

A device which modulates digital data into a form suitable for transmission over the analogue speech telephone system or demodulates incoming analogue data into digital form.

Parity bit

A parity bit is an extra bit that is sometimes added to a character as a simple form of error check. Parity may be either even or odd. If the parity is odd then the parity bit of a given character will be a 1 if the number of 1 bits in the character is even or 0 if it is odd i.e. whatever the number of 1's in the original character, it will be odd following the addition of the parity bit. If even parity is used then the number of 1 bits in the character following the addition of the parity will always be even. Both the receiving and sending equipment must be working on the same parity. If a character is received with an odd number of 1 bits (including the parity bit) when even parity is in use, then it is obvious that an error has been introduced during the transmission.

Protocol

A protocol is the set of rules which both the sending and receiving equipment must obey in order to establish meaningful communication.

RS232 interface

An RS232 interface is a device which converts parallel data into a serial form which may be transmitted over a two or three wire circuit. It provides the link between a computer and a modem. The interface also converts the incoming serial bit stream into parallel form and is an international standard.

SIO - see RS232 interface

Start bits

This is an extra bit added to a data word before transmission so that the receiving equipment recognises the start of the character. The start bit is automatically generated by the sending RS232 interface and then removed by the receiving interface.

Stop bits

During data transfer, 1 or 2 extra bits may be added onto the data word by the RS232 interface so that the receiving equipment can detect the end of the word. These are the 'stop' bits and depending on the quiescent state of the line may be 0's or 1's. The generation of the correct start and stop bits at the sender and then their removal at the receiving equipment, is totally transparent to the user and is carried out by the RS232 interfaces.

Terminal

A device by which a person can communicate with a host computer.

Word length

The number of bits which are recognised as comprising a unit of data transfer, a word. This need not be the same as the word length within the computer, extra formatting bits are added during data transfer (stop and start bits).

Xon/Xoff

A simple form of data transfer protocol. If the receiving system wishes to stop the transmission, for example, to transfer the data it has already received on to disc, then it sends an 'XOFF' signal to the host. Once the sender receives an XOFF signal it ceases transmission until it receives an 'XON' from the receiver.

Xmodem

A relatively sophisticated form of file transfer protocol, developed by Ward Christensen, that allows the transfer of any type of file, either ASCII or binary, without conversion. Complex error checking is carried out to ensure the integrity of the transferred file.

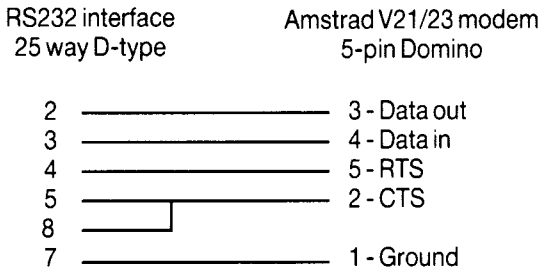
Appendix B

RS232 interface connections

Fig. B-1 : 25-way D-type pin numbering
(RS232 interface connector)

| Pin | Function |
|-----|------------------------------------|
| 1 | Protective Ground |
| 2 | Transmitted data |
| 3 | Received data |
| 4 | RTS - Request to send (output) |
| 5 | CTS - Clear to send (input) |
| 7 | Signal Ground |
| 8 | DCD - Data Carrier Detect (input) |
| 20 | DTR - Data Terminal Ready (output) |
| 25 | +5V - (reference output) |

The following cable specification will ensure correct operation of the interface with the Amstrad V21/23 modem :



Appendix C

Use under CP/M

Introduction

For use under CP/M the RS232 interface provides a single channel serial port which is supported without the need for additional software.

CP/M provides hardware flow control and the version of CP/M 2.2 supplied with the DDI-1 disc interface or the CPC664 and 6128 fully support the four conventional logical I/O devices: CONSOLE, READER, PUNCH and LIST. At any given time one of these logical devices may be attached to the RS232 channel by using STAT to change the logical to physical I/O assignments maintained by the I/O BYTE. In summary the possible logical to physical assignments are :

CONSOLE

The main device used to input commands to, and output responses from CP/M.

Logical device CON: may be assigned to :

TTY: (RS232 channel)
CRT: (Keyboard & screen)
BAT: (input READER, output LIST)

READER

General purpose input device.

Logical device RDR: may be assigned to :

TTY: (RS232 channel)
PTR: (End of File input)
UR2: (keyboard)

PUNCH

General purpose output device.

Logical device PUN: may be assigned to :

TTY: (RS232 channel)

PTP: (Null output)

UP2: (Screen)

LIST

Main listing device (activated with [CTRL]P).

Logical device LST: may be assigned to :

TTY: (RS232 channel)

CRT: (Screen)

LPT: (Centronic port)

Use of STAT

The IOBYTE assignments are also given by the CP/M utility STAT when used with the parameter VAL:, e.g.

A>STAT VAL:

```
Temp R/O Disk: d:=R/O
Set Indicator: d:= filename.typ $R/O $R/W $SYS $DIR
Disk Status : DSK: d:=DSK:
User Status :USR:
Iobyte Assign:
CON:  = TTY: CRT: BAT: UC1:
RDR:  = TTY: PTR: UR1: UR2:
PUN:  = TTY: PTP: UP1: UP2:
LST:  = TTY: CRT: LPT: UL1:
```

A>

The devices UC1, UR2, UP2 and UL1 are usually implemented as Channel B of the RS232 interface which is not provided on this interface. Channel A of the interface is simply referred to as the RS232 or serial channel in this text.

The CP/M supplied with Amstrad computers has the default assignments set as follows:

```
CONSOLE (CON:) assigned to keyboard and screen (CRT:)
READER (RDR:) assigned to RS232 channel (TTY:)
PUNCH (PUN:) assigned to RS232 channel (TTY:)
LIST (LST:) assigned to Centronics parallel port (LPT:)
```

The current assignments may be determined at any time by using STAT with the parameter DEV:, e.g.

```
A>STAT DEV:
CON: is CRT:
RDR: is TTY:
PUN: is TTY:
LST: is LPT:
```

A>

By using STAT to assign a physical device to a required logical device it becomes possible to choose where input and output from CP/M is routed. For example, the RS232 channel may be used to drive a serial printer by assigning the LIST device (LST:) to TTY:. This is done with the STAT command as follows :

```
STAT <logical device>=<physical device>
```

thus to use the serial printer the command becomes

A>STAT LST:=TTY:

This change can then be checked with STAT DEV: if so desired.

The assignments made using STAT only apply until the system is cold-booted whereupon the default assignments will be reinstated. To make assignments permanent you must use the program SETUP.

Changing the defaults

Amstrad CP/M allows the initial values of useful default system parameters to be set so that they take effect when CP/M is invoked (normally with **I** CPM). These parameters are stored on a system disc in a special configuration sector. **SETUP** allows these configuration parameters to be set by presenting each parameter in turn and asking for any changes. There are thirteen sections but only two are concerned with the operation of the RS232 interface, they are :

Section 6 : Default IOBYTE setting

13 : RS232 baud rate, data bits, parity and stop bits

After inserting a copy of the supplied CP/M system disc, type **SETUP** at the CP/M prompt and answer **Y** until section 6, Default IOBYTE settings. The current settings as given by **STAT DEV:** will be displayed. At this point you alter the default settings and the new values will become the defaults until you use **SETUP** again. To assign the serial printer type **Y** and then :

LST:=TTY: [ENTER]

The new default assignments will then be redisplayed.

Section 13 of **SETUP** allows the parameters for the RS232 channel A to be changed and normally section 14 would cater for channel B which is not implemented on this interface.

The default RS232 settings are :

9600 baud receive
9600 baud transmit
data bits
no parity
stop bit

In section 13 the transmit and receive baud rates for the RS232 channel may be independently assigned to one of :

9600 4800 3600 2400 2000 1800 1200 600
300 200 150 110 75 50 45

The number of data bits may be changed to 5, 6, 7 or 8.

The parity may be selected as ODD, EVEN or disabled with NONE.

The number of stop bits may be 1, 1.5 or 2.

Parameters must be entered in the order that they are displayed on the screen. For example, to change to 1.5 stop bits you must enter :

9600 9600 8 NONE 1.5 [ENTER]

Transferring files

The CP/M program PIP (Peripheral Interchange Program) allows logical and physical devices to be considered as if they were disc files, the device names being the same as those used with the STAT command. The general syntax of a PIP command is :

```
PIP <destination>=<source>
```

The <destination> and <source> can be either a disc file or logical device. If we assume that the PUNCH device has been assigned to the RS232 channel by using STAT, the following PIP command will transfer the file DUMP.ASM to the RS232 interface :

```
A>PIP PUN:=DUMP.ASM [ENTER]
```

Similarly a file TEST.DOC may be read from the serial interface using :

```
A>PIP TEST.DOC=RDR: [ENTER]
```

where the READER (RDR:) is assumed to be assigned to the serial interface.

PIP has many additional features and options for data transfer including a block transfer mode and the ability to deal with both ASCII and non-ASCII files and the formatting of data. For example, the command line below will send the file DUMP.ASM to the LIST device with line numbers and page ejects at every 50th line.

```
A>PIP LST:=DUMP.ASM[P50]
```

For more information on the use of PIP refer to the CP/M operating system manual.

Appendix D

Error codes

The command `ICERROR` may be used to return an error code for the last command used. In general commands can partially execute before an error is detected and then abort, or may be totally unsuccessful and have no effect.

The errors given consist of a number, the meanings and interpretation of which are listed here in ascending order :

0: No error

The error code 0 indicates that an operation has been successful and no errors have occurred.

1: Too few parameters

There were too few parameters given in the command. Some commands have parameters which must always be given and one of these was not supplied. The command was not successful.

2: Too many parameters

The command was supplied with too many parameters and was unsuccessful.

4: Timeout

The timeout limit set by the `ICTIMEOUT` command was exceeded whilst waiting to send or receive a character.

5: Invalid parameter

This is a general error code given when a parameter is not within the expected range of values thus causing the command to be aborted.

6: Line Break

The command was unable to receive a character due to a line break being detected. If `XON/XOFF` is being used then this error will also be given when characters are being transmitted since it would be impossible operate the handshake.

7: Framing Error

A character was received with an RS232 framing error.

8: Receiver Overrun

This error occurs when a received character has not been read from the SIO before the next character arrives. This is more likely to occur when no handshake is being used.

9: Received Parity error

A character was received with a parity error.

10: Channel not opened

An attempt was made to transfer data before the appropriate **I**COPEN command had been issued to initialise the serial port.

11: Invalid baud rate

The baud rate given for either of the parameters `<baudrate>` or `<rxbaud>` in the **I**COPEN command were not one of the following:

9600 7200 4800 3600 2400 1800 1200 600 300 200 150
100 75 50 45

12: Invalid flow control type

The parameter `<flow>` in the **I**COPEN command was invalid, it should be 0 or 1.

13: Invalid number of data bits

The parameter `<databits>` given in the **I**COPEN command was not in the range 5..8.

14: Invalid Parity

The parameter `<parity>` given in the **I**COPEN command was not 0 (no parity), 1 (odd parity) or 2 (even parity).

15: Invalid number of stop bits

The parameter `<stopbits>` given in the **I**COPEN command was not 0 (1 stop bit), 1 (1.5 stop bits) or 2 (2 stop bits).

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