

BEEBUG

Master Modem

The cover features several thick, wavy lines in shades of orange and white that sweep across the lower half of the page, creating a dynamic, modern feel.

USER GUIDE

Beebug Master Modem & Command Software

APPROVED for connection to
telecommunication systems specified
in the instructions for use subject to
the conditions set out in them.

S/3113/3/H/501018

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Command was written by David Pilling

This user guide was written by David Pilling and John Wallace

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Contents

Section 1 - Introduction to the Master Modem

Section 2 - Statutory Requirements

Master Modem approval	6
PABX use	7
Ringer Equivalence Number (REN)	8

Section 3 - Installation instructions

Preparing the computer	9
Fitting the modem board	10
Main ribbon-cable connection	11
Audio connection	12
Telephone-lead connection	13
Fitting the Command ROM software	13
Re-assembling the computer	13

Section 4 - Introduction to Command

Introduction to Communications	14
How to use Command	14
How to use this manual	15

Section 5 - Getting started

Testing the Command software	16
Testing the modem	16
Connecting up your modem	17
Achieving instant results	17
Accessing Prestel and similar systems	18
Accessing scrolling text systems	19

Section 6 - The Viewdata terminal

Overview	20
Entering the terminal	20
Viewdata Terminal screen display	20
OS commands	21
Viewdata help screen	21
Setting the correct baud rate	21
Auto-dialling	22
Problems getting connected	22

Browsing through a database	23
Summary of browse commands	24
Frame tagging	24
Downloading telesoftware	25
Filling in response frames	25
Sending message frames	26
Terminal functions	27
Section 7 - The Text terminal	
Overview	30
Entering the terminal	30
Text Terminal screen display	30
OS commands	31
Text help screen	31
Setting the correct baud rate	31
Auto-dialling	32
Problems getting connected	32
Terminal functions	32
User to user communication	35
Split screen operation	36
Section 8 - Telephone directory	
Overview	37
Getting started	37
Directory fields	38
Entering and editing entries	39
Function key operations	39
Example directory	40
Section 9 - Viewdata editor	
Overview	41
Getting started	41
Simple cursor movement	41
Teletext effects an on-screen help	42
Changing text colours	42
Graphics colour codes	42
Other teletext effects	43
Copy editing	43
Inserting/deleting lines and characters	44
Using your own function key strings	44
Pixel editor	45
Exiting from the editor	45
Saving and printing screens	45

Section 10 - Status settings	
Overview	46
Status settings	46
Section 11- Commands	
Overview	49
Command parameters	50
Command descriptions	51-71
Section 12 - Bulletin Board	
The Ghost Host	72
Setting up your own bulletin board	72
Customising your bulletin board	73
Appendices	
Appendix A - Error messages	75
Appendix B - Osword calls	77
Appendix C - EXEC files	80
Appendix D - Xmodem explained	81
Appendix E - Command summary	83

1. Introduction to the Master Modem

The Beebug Master Modem is a high quality internal modem for the Master 128. It is very easy to install, and is for use in the transfer of information between computers over telephone networks. The modem is supplied with the **Command** software, which provides easy access to huge databases such as the British Telecom Prestel service.

The Beebug Master Modem is approved for use on telephone systems run by British Telecom only when used as detailed in the instructions for use.

The Approval number is: S/3113/3/H/501018

The modem offers the following features:

- fits internally in Acorn Master 128
- just plugs in - no soldering required
- supplied with easy to use software
- 300 baud full duplex (V21)
- 1200/75 baud full duplex (V23)
- auto-dial facility
- V25 auto-answer facility
- line monitoring through computer speaker
- tinkle suppression

The next section of this user guide describes the British Telecom regulations with respect to the use of the approved equipment, and section 3 describes how to install the modem and test that it is working correctly. The rest of the manual describes the Command software and includes a section (section 5) to help you get started with the minimum amount of reading.

2. Statutory Requirements

Master Modem approval

This apparatus has been approved for the use of the following facilities:

1. Modem
2. Auto-dial
3. Auto-answer
4. Call progress monitoring

Any other usage will invalidate the apparatus if as a result it then ceases to conform to the standards against which approval was granted. This modem is approved for use on telecommunication systems run by British Telecom, in accordance with the conditions in the instructions for use.

The approval of this modem for connection to the British Telecom public switched telephone network is INVALIDATED if the apparatus is subject to any modification in any material way not authorised by BABT, or if it is used with, or connected to:

1. internal software that has not been formally accepted by BABT.
2. external control software or external control apparatus which causes the operation of this modem or associated call set-up equipment to contravene the requirements of the standard set out in BABT/SITS/82/005S/D.

All apparatus connected to this modem and thereby connected directly or indirectly to the British Telecom public switched telephone network must be approved as defined in section 16 of the British Telecommunications Act 1981.

PABX use

The apparatus does not have a PBX earth register recall facility, and does not have a PBX timed break facility. The apparatus is suitable for connection to a PABX which returns secondary proceed indication.

The apparatus is only approved as an extension instrument to compatible PBX's. The supplier of the apparatus should be consulted for an up to date list of PBX's with which this apparatus is compatible.

It cannot be guaranteed that the apparatus will operate correctly under all possible conditions of connection to compatible PBX's. Any cases of difficulty should be referred in the first instance to the supplier of this apparatus.

The apparatus is connected to the PBX extension wiring by means of a plug. The user may plug it in and use it straight away if the appropriate extension wiring and/or sockets are installed. If these sockets require installation, this must be carried out by:

1. British Telecom, or
2. where the extension wiring is not owned by British Telecom, by the authorised maintainer of the PBX, unless the authorised maintainer has been given 14 days written notice that the extension wiring and/or sockets are to be installed by another person, and that period of notice has expired.

This modem is suitable for connection to a direct exchange line which is not a shared service line, or a line connected to a one plus one carrier system.

Ringer Equivalence Number (REN)

The Ringer Equivalence Number or simply REN, is a customer guide indicating the maximum number of apparatus that should be simultaneously connected to a single telephone line without seriously affecting the bell (or tone) ringing characteristics of the items connected.

The REN value of this equipment is 1 (one). To calculate the number of items (usually telephones, but not necessarily so) that can be connected to a single exclusive telephone line, simply add up all the REN values of the connected equipment and the sum total should be 4 (four) or less. The British Telecom supplied prime instrument is assumed to have a REN of 1 (one) unless otherwise marked, and all other equipment should be clearly marked with an appropriate REN.

Please note that if the sum total of the REN (of the connected equipment) is in excess of 4 (four) then the bell volume and/or ringing tone of the equipment connected on a single line at a particular location may become less audible at the installed instrument.

3. Installation

instructions

Before attempting to install this unit please check the following items are enclosed:

- Master Modem with connecting telephone lead and 3 way cable
- two modem fixing screws
- one replacement back panel fixing screw
- a 16K ROM containing the Command software
- a dual-format disc containing Command utilities
- keystick for Command software
- British Telecom socket application card

If any of these items are missing please contact your supplier within three days of receipt. Please check the modem for signs of damage - **do not attempt to install the modem if it appears to be damaged.**

The following instructions describe how to fit the modem. You will need a small screwdriver and a sharp knife; no other special equipment is required. If you are in any doubt about fitting the modem please contact the Beebug technical department for advice.

Please read the following instructions carefully.

Preparing the computer

1. Switch off and unplug your computer from the mains power supply.
2. Unscrew the four screws on the underside of the computer labelled *fix*, and remove the lid.

3. Position the computer so that the keyboard is towards you.

4. The modem will be fitted in the gap between the power supply unit and the main computer circuit board. If a battery pack is in this position, you will have to remove it and install the new style battery pack available from any Acorn dealer (Beebug stock code 0807B). No changes are required if you already have the new style battery pack, which is located at the extreme left-hand end of the keyboard (see Diagram 1).

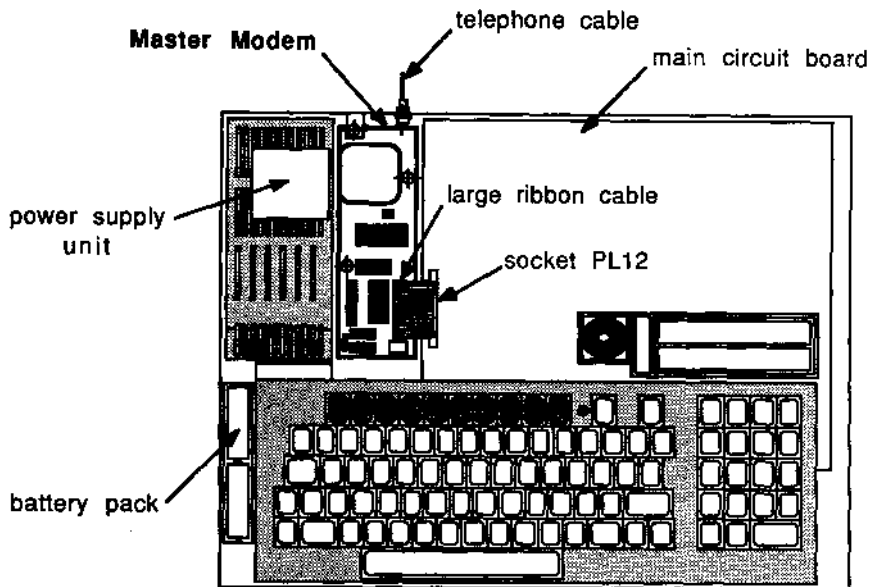


Diagram 1

5. Remove the white clip from the top of socket PL12 on the main computer circuit board. Socket PL12 is located along the left-hand edge of the board (see diagram 1). The clip is removed by squeezing the lugs at each end, and lifting. If you have trouble removing the clip, you may find it helpful to lever the bottom of the lugs out, whilst lifting. Once removed, the clip should be slid onto the large ribbon cable on the modem in such a way that when the modem is fitted the clip will fit back onto socket PL12 in the same orientation.
6. Carefully cut out the perforated section on the computer back panel for the telephone cable to pass through. The perforated section is located just to the right of the UHF socket. This opening is for the telephone cable to pass through.

Fitting the modem board

7. Position the modem in the gap between the power supply unit and the computer circuit board. The telephone cable should be at the back of the computer. Adjust the modem position so that the two fixing holes in the modem board are lined up with the mounting posts underneath, and secure with the two screws supplied.

8. It may be necessary to replace the back panel fixing screw with the shorter screw provided, to allow the modem board to pass underneath. See Diagram 2 for position of back panel fixing screw.

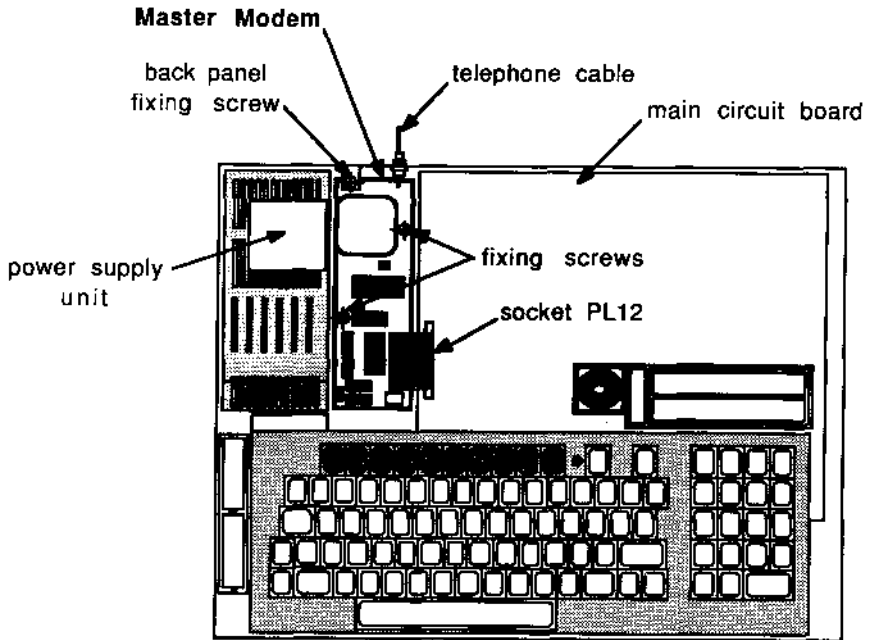


Diagram 2

Main ribbon-cable connection

9. Ensure that the bare wires at the end of the main ribbon cable on the modem are straight. Ensure also that the clip from PL12 has been fitted onto the cable (*see* step 5 above).
10. Carefully insert the ribbon cable into socket PL12 on the main computer circuit board. Check that all the wires are fitted firmly in the socket, with only one wire in each hole.
11. Once you are sure the ribbon cable is firmly connected, slide the clip down over socket PL12 and click into place.
12. If the clip does not locate firmly into the socket, try fitting it the other way around (the clip will only fit one way around, and you may have accidentally transposed it).

Audio connection

- Carefully remove the ROM cartridge assembly from the main computer circuit board. The ROM cartridge assembly is the plastic moulding located at the right-hand side of the main circuit board (see diagram 3).
- The three way ribbon cable attached to the modem should be connected to the plug marked *MODEM* located on the main computer circuit board beneath the keyboard and just in front of the loadspeaker. Make the connection in such a way that the wire at the modem end that is nearest the keyboard, is towards the right-hand side of the computer at the *MODEM* end. The three wires on the cable are different colours to enable you to do this correctly. **Your modem will not work correctly if this cable is not connected as described above.**
- Replace the ROM cartridge assembly, so that it fits snugly onto the main circuit board.

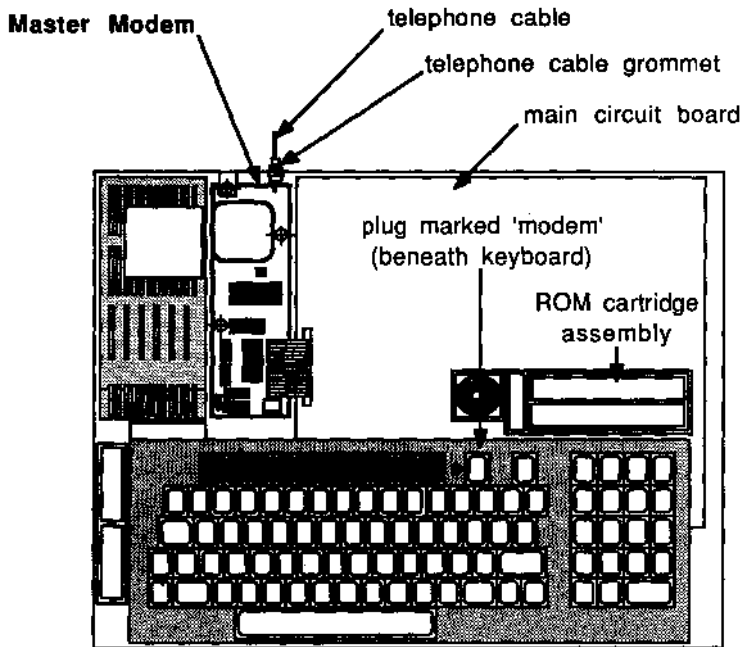


Diagram 3

Telephone-lead connection

16. Push the telephone connecting lead grommet into the slot in the back panel of the computer (prepared in stage 6 above). When you want use the modem, this lead should be connected to the standard British Telecom telephone jack socket. **If you do not have a suitable** socket fitted, then you must **ask British Telecom to install one for you**. A suitable application form is provided which should be completed and returned to your local British Telecom sales office.

Fitting the Command ROM software

17. Command is supplied on a 16k ROM and should be plugged into the sideways **ROM socket numbered 27**. This is located on the main computer circuit board at the right-hand side. It should be fitted so that the notch in the ROM is towards the left of the computer. If you are unfamiliar with installing sideways ROMS, you should refer to your dealer or contact our technical department.

Warning: It is absolutely essential to insert your ROM the correct way round. Failure to do so will destroy the ROM.

If there is already a ROM in socket 27 then it should be removed and fitted in a ROM cartridge. The Command ROM must be fitted in socket 27, and should not be fitted in a ROM cartridge. If the ROM is not present in the computer on power-up, the modem will not be initialised, and will not operate correctly.

Re-assembling the computer

18. Re-fit the computer lid, and secure the four fixing screws.

Now proceed to sections 4 and 5 where you will be introduced to the software, and the method for testing the modem will be described.

4. Introduction to Command

Introduction to communications

Command is, we believe, the most powerful, flexible and comprehensive software on the market for Master computer users who wish to open up their micro to the world of communications. Using modem and phone line, users of Command can 'talk' to a friend's micro-computer, or access a huge database such as British Telecom's Prestel service. At the press of a key, Prestel gives you access to thousands of pages of information, such as news, weather, sport, entertainment, and much much more. It also includes a service called Micronet 800, which offers computer news, reviews, advice and many free programs that can be downloaded at the press of a key.

On a smaller scale are Bulletin Boards, which offer a similar service to Micronet, but are usually free, and are run by individuals or groups of micro enthusiasts. A Bulletin Board is simply a program, usually running on a micro-computer, that answers the phone, displays information, takes messages, and gives the caller access to the data in its own files. There are now hundreds of Bulletin Boards in operation across the country, many offering free programs to download, and most allowing you to leave messages for the operator or other callers to answer.

Anyone with a computer and modem, can run their own Bulletin Board, and Command provides Basic programmers with the necessary facilities to write their own personal Bulletin Board. A simple Bulletin Board program is supplied on the Command utility disc, and is described in section 12.

How to use Command

Massive flexibility has been built into this software, and it may be called up in many different ways. Above all however, it may be command driven. This means that each of its 50 or so commands are at the direct control of the user, and may be incorporated into simple Basic programs to perform complex or repetitive tasks.

Most users will find that the easiest way to get on-line and start communicating, is to call one of the two terminals in Command. The Viewdata Terminal will allow you easy access to Prestel and similar services, and the Text Terminal can be used to call scrolling text services and Bulletin Boards.

Once you have become more familiar with the software, you can use the software commands in your own Basic programs to create powerful customised communications software.

How to use this manual

To call Prestel or any other service almost instantly, refer to section 5 which gives step by step instructions for getting on-line. Sections 6 and 7 explain the Viewdata and Text Terminals in detail, and should be mastered to make full use of Command. Chapter 11 describes each command in detail and is intended for more advanced users, but it may be read in conjunction with other parts of the manual to provide more detailed information about specific functions.

5. Getting Started

Testing the Command software

You can check that the ROM is correctly installed by typing:

```
*HELP RETURN
```

You should see a message similar to the following:

```
Command 3.00
```

The number displayed is the version number of the software, and may be different to that printed above. Please make a note of the version number and always refer to it in any correspondence with Beebug. The software will remain installed until the computer is powered-down. A ROM image containing screen dump (*SDUMP) and buffer dump (*BDUMP) facilities is supplied on the utility disc. If you wish to use either of these facilities then insert the utility disc in drive 0 and auto-boot it. This is done by holding down **SHIFT**, pressing **BREAK**, releasing **BREAK** and finally releasing **SHIFT**. The ROM image will then be loaded and initialised.

Testing the modem

To test that your modem is working correctly follow the steps below:

1. Switch on the computer.
2. Insert the Command utility disc into drive 0 and type:

```
CHAIN"TEST"RETURN
```

The utility disc is 40/80T dual-format DFS standard. If you do not have a disc drive, please contact our technical department for an alternative method of testing the modem.

3. When the program **TEST** has loaded you will be presented with a blank screen with the word **TEXT** at the bottom. This is the text terminal and if the modem is working correctly anything typed at the keyboard should be sent to the modem and echoed back to the screen.

4. Once you are satisfied that the modem is echoing characters back to the terminal, disconnect the modem by typing:

SHIFT f3

5. Press **f9** to leave the text terminal.

Connecting up your modem

Command allows you to use the many communications facilities accessible via the telephone, using the Beebug Master Modem. The modem must be installed as described in section 3 and tested as described above. The modem telephone lead should be connected to the standard British Telecom telephone jack socket.

If you do not have a suitable socket fitted, then you must ask British Telecom to install one for you. A suitable application form is provided with this guide which should be completed and returned to your local British Telecom sales office.

A special adaptor can be used to connect a telephone to the socket at the same time as the modem. This reduces wear and tear on the socket, and allows manual dialling. **Any adaptor or additional socket used should be BAPT approved, otherwise it may invalidate approval on the apparatus.** Only one telephone though, should be connected to the same phone line for the modem to function correctly. Please note that the total REN number of apparatus connected should be 4 (four) or less (see page 8 for an explanation).

Achieving instant results

Command is a powerful piece of software with a comprehensive selection of commands and features that may take some time to master fully. The rest of this section explains how to achieve instant results using the Viewdata and Text terminals. Once this is understood you can move on to sections 6 and 7, which describe both terminals in detail and introduce many new features.

Accessing Prestel and similar systems

To access Prestel or other similar viewdata systems using the 1200/75 baud standard, proceed as follows:

Type: *VIEWDATA **RETURN**
Press: **f2**

Now enter at the keyboard the telephone number that you wish to dial. The London number for the Prestel Kipling computer is:

01 618 1111

You may wish to phone directory enquiries for the number of your nearest Prestel computer.

Press **RETURN** once the number has been entered, and you should hear through the computer speaker the number being dialled. If no dialling is heard this would suggest that the modem is not fitted correctly (check through the fitting instructions again). Within half a minute or so you should be connected, and the Prestel front page should appear on the screen. All that remains to be done now, is to enter your ID (identification number) and password as requested, and you are into Prestel!

If you are not a Prestel or Micronet subscriber, you can use the ID:

4444444444

followed by the password:

4444

This gives you a strictly limited promotional tour of Prestel and Micronet. There are other databases, such as Gnome at Home (01 888 8894) and Technomatic (01450 9764) that do not require you to be a subscriber.

If you have no success in getting connected, it probably means that you are dialling the wrong number or that the line or lines are engaged. To repeat the call press: **f2 RETURN**

Normally, to leave Viewdata services you should type **SHIFT f8**, which causes the remote computer to display its 'goodbye' frame. If, however, a Viewdata service does not respond to this, press **SHIFT f3** to disconnect.

Accessing scrolling text systems

The alternative standard to the Prestel system is the Text system used by Telecom Gold and many private bulletin boards. These normally run at 300 baud, and can be accessed from Basic by proceeding as follows:

Type : *TEXT RETURN

Press: **SHIFT f0** until V210 appears at the bottom of the screen.

Now proceed as described above. Both Beebug and other popular computer journals print regular lists of bulletin board numbers for you to try.

To leave a Text bulletin board simply press **SHIFT f3** to disconnect. Please note that many services request that you inform them before going 'off-line'

.

6. The Viewdata terminal

Overview

This terminal allows you to communicate with Prestel and other similar viewdata services, giving you access to thousands of pages of information. Viewdata services utilise the teletext character set, which offers coloured text and graphics, and special features such as double height characters, separated graphics and flashing text or graphics.

Entering the terminal

Before starting to use the Viewdata Terminal, position the function key strip entitled Viewdata Terminal above the red function keys on your computer. Make sure that *Command is positioned immediately above the red function key **f0**.

To get into the Viewdata Terminal type:

```
*VIEWDATA RETURN
```

This command (like all other commands) may be abbreviated with a full stop and can be preceded by the letter 'B' to prevent command name clashes with other software. See section 11 for further details.

To leave the terminal press **f9**, and to enter the Text Terminal (described in section 7) press **SHIFT f9**.

Viewdata Terminal screen display

If all is well you should now see the terminal front page, which is a blank screen with a status line at the bottom of the screen looking something like this:

```
VIEWDATA:Offline V230 . . .
```

This indicates that you are in the Viewdata Terminal, and that Command is 'offline'. The baud rate standard is displayed next (V230), followed by three dots which will be replaced by the letters S, P and X when certain features of Command are activated. These features (Spon, Pron and Xon) are only used in the Text terminal, so further details are given in section 7.

The line above the status line is usually used for prompts and messages, and the rest of the screen is used to display the Viewdata frames.

O.S. Commands

At any time whilst you are in the terminal you can issue O.S. commands (* commands) by pressing **f0**, and typing in the command name followed by **RETURN**. All commands in the Command software, as well as the usual disc and operating system commands, can be called in this way.

Many of commands are available by simply pressing the relevant function keys, but if you wish, you can call them by their full command names. For example, to download a program you can press **f5**, or alternatively press **f0** and type **DOWNLOAD RETURN** from the keyboard.

Viewdata help screen

A help screen giving full details of the function key settings for the Viewdata terminal can be called up at any time by pressing **f1**. Press the function key you require, or **ESCAPE** to clear the help screen and restore the previously displayed screen.

Setting the correct baud rate

To access Viewdata services you will normally use the V23 standard, operating in Originate mode. The V23 standard operates at a baud rate of 1200/75 full duplex, which means that the 'originate' modem is receiving data at 1200 baud (approximately 120 characters per second) and transmitting at 75 baud. If conversing directly with another modem, the other modem should be set to the corresponding 'answer' mode V23A (receiving data at 75 baud and transmitting data at 1200 baud).

Normally, therefore, Command should be set to V2 30 (the '0' standing for Originate). The V230 standard is the default setting in Command, and does not normally need to be set unless another standard has been selected since entering the terminal. If the status line at the bottom of the screen does not display V230, then it can be selected by pressing **SHIFT f0** until it appears.

There is also another standard called V21, that operates at a baud rate of 300/300 full duplex. This is normally only used in the Text terminal, so further information about this standard is given in section 7.

The following table summarises the four standards described above.

Standard	Baud Rate	Transmit Rate	Receive Rate
V21A Answer	300/300	300	300
V210 Originate	300/300	300	300
V23A Answer	1200/75	1200	75
V230 Originate	1200/75	75	1200

Auto-dialling

Once you have checked the software is set to the correct baud rate, you can dial the telephone number. Press **f2** and enter the required number at the keyboard, then, press **RETURN**. If you have already dialled a number since start-up, the previous number will be re-displayed should you want to re-dial it. To re-dial it just press **RETURN**, otherwise delete the previous number (use **CTRL U**) and enter the new number in full.

If the number you require is in the Command telephone directory, you can enter the name of the directory entry instead of the number (see section 8 for details of the telephone directory).

You should hear the dialling tones from the computer loudspeaker as the number is dialled, and as soon as you are connected, the message 'Offline' on the status line, will change to 'Online'.

Problems getting connected

If you have no success getting connected press **f2**, and check the number displayed is correct. Try re-dialling the number by simply pressing **RETURN**. If you get no success after several attempts, check that the telephone lead is connected correctly, and that the baud rate is correct.

If you get 'online but the characters you receive are corrupted, then it probably means that the baud rate is incorrectly set. Remember that although most Viewdata services operate at 1200/75 baud, some do not, and it is important to check this before dialling.

Some telephone systems require a code (e.g. 9) to be dialled first for an outside line, and cannot dial the main number until a further dialling tone is received. If this is the case, try putting a colon (:) between the code and the main number. This will cause Command to dial the code, and then pause before dialling the main number.

Browsing through a database

A Viewdata database can consist of hundreds or even thousands of pages of data and information, and there are two ways of browsing through it.

1. Selecting options offered on the screen.

Many Viewdata pages display a menu of options that can be selected from by pressing the keys **0** to **9**, and **#**. For convenience the **RETURN** key can normally be used instead of **#**.

2. Entering a page number and moving directly to that page.

A page number can be accessed by typing ***** followed by the page number, and then pressing **RETURN**. For example:

***50000 RETURN**

will display page 50000. If you make a mistake, just press **DELETE** as usual, to correct it.

Prestel allows you to step backwards through three previously viewed frames by pressing **T**. Pressing **T** will take you back to the root page, from which all other pages can be accessed. This is useful if you become totally lost within the database. Viewdata frames can contain 'concealed' text, which is normally not visible, so **SHIFT |** will reveal any concealed text on the current frame. The text may re-conceal with **SHIFT |**. You can request re-transmission of a corrupted Prestel frame by pressing **COPY**. If the frame has a charge, then the re-transmission is free. You can also use **SHIFT COPY** to receive the latest update of a frame. This is useful for frames that are updated very frequently, such as airport flight times.

Summary of browse commands

The following list summarises some of the simple key presses available in the Viewdata Terminal. The characters shown in brackets, are the actual characters sent to the terminal when that particular key is pressed.

<-	backtrack through frames	(*#)
->	send #	(#)
	move to root frame	(*0#)
	send *	(*)
COPY	re-transmit frame	(*00)
DELETE	deletes characters	(**)
RETURN	send #	(#)
SHIFT COPY	update frame	(*09)
SHIFT 	conceal	
SHIFT 	reveal	

Frame tagging

The methods described above for browsing through a viewdata database, are usually satisfactory for most purposes, but sometimes it can be difficult to return to a particular Prestel frame spotted during browsing. Frame tagging solves the problem by allowing you to 'tag' interesting frames as you come to them, for easy recall later.

To tag the current frame, simply press **SHIFT RETURN**. Notice that the frame number on the top line of the screen will flash to confirm it has been tagged. To recall this frame at a later stage press **SHIFT <-**. If a series of frames have been tagged, they will each be recalled as you step back through the list. To move forward through the list of tagged frames, press **SHIFT ->**. If you tag back to a particular frame, then start tagging new frames, you will overwrite the frames that were originally in the list. It is possible to tag all frames in Prestel except those that require user input (i.e. #) to view them. Note also that if a frame is not the first frame in a page there will be a delay in accessing it, as each previous frame is accessed.

Downloading telesoftware

Computer programs can be downloaded directly from Prestel to your computer, for immediate running or saving to disc. When you have found the software you wish to download, read the on-screen instructions, and make a note of any special running instructions that are given. When you see the instruction to commence downloading, press **f5**, and enter a filename to save the file with, or press **RETURN** to save the file in the buffer. The program will now be downloaded as a series of frames.

The bottom line of the screen shows the frame number currently being received, the total number of frames that make up the program, and the number of re-tries that have been made to receive the frame. If data is corrupted during downloading, due to 'line noise' for example, the frame will be automatically re-transmitted. The number of re-tries made is set by the command ***RETRY**, and is 10 by default.

It is normally best to download programs to the buffer, as this is less error-prone. When the whole program has been read into the buffer, you will be prompted with the Prestel filename for the program. Press **RETURN** to save the program, or **ESCAPE** to leave it in the buffer. If the file completely fills the buffer, you will be prompted for a filename, and the buffer will be written to disc. Further frames received will be written to the same file, until the download is complete.

Disc users should ensure that they have a formatted disc ready to save programs on before downloading commences. Make sure that the disc is blank, or has sufficient free space for the files being downloaded.

Filling in response frames

Quite often when browsing through Prestel you will come across response frames. These are frames that you may fill in, and send back to Prestel, such as Mailbox frames and Information Provider frames. A response frame can usually be identified by the flashing cursor which appears somewhere on the screen.

In a response frame the cursor keys revert back to their normal use - to move the cursor around the screen. **DELETE** also functions as normal, but **RETURN** still sends a #, which normally terminates your response. To send a real Return (CHR\$13) press **CTRL RETURN**. The special functions that normally use these keys are still available by pressing

CTRL and the relevant key. You can introduce an escape sequence to produce colour codes, by pressing **SHIFT DELETE**, followed by a character.

SHIFT DELETE A	red text
SHIFT DELETE B	green text
SHIFT DELETE C	yellow text
SHIFT DELETE D	blue text
SHIFT DELETE E	magenta text
SHIFT DELETE F	cyan text
SHIFT DELETE G	white text

Finally, **COPY** transmits the character under the cursor, and **SHIFT _** prints a solid cursor block character.

Sending message frames

This section describes sending Mailbox message frames on-line, and preparing them off-line. Page 7 of Prestel offers a choice of blank message frames that you can use to send your messages, as well as a directory of Mailbox subscribers. You can send plain straightforward frames containing a simple message, or more detailed frames such as greetings card frames which include graphics.

To send a message on-line, locate the message frame you want to use, enter the Mailbox number of the person to whom you want to send the message, and finally enter the message itself. The ends of the fields into which these details are entered, are usually marked with a #. The editing facilities available are the same as those described in the last section entitled 'Filling in response frames'.

You may also prepare a message off-line for later transmission. Simply locate the blank message frame you wish to use and save it to disc. Now go off-line, load in the blank frame, and use the viewdata editor to fill in the fields. Each field has a # at the end, and this must not be overwritten or moved. When you have completed the message, leave the editor and save the frame. To send the frame, go back on-line and locate the same blank frame that you used to prepare the message on. Load in your message frame and send it with **SHIFT f5** as described above.

If you are an information provider, you can send a complete frame to Prestel. To do this, go on-line, select the page for the Online Editor, and

follow the on-screen instructions until Prestel waits for you to edit the screen contents. At this position the cursor should be at the top left hand corner of the screen. Now load the frame you wish to send, and press **SHIFT f5** to send the frame. The frame you wish to send can be created off-line using the viewdata editor, and saved to disc.

Terminal functions

A full range of terminal functions are available from the function keys at the top of the keyboard. A key may be pressed on its own, or together with **SHIFT** to provide a specific facility. The normal function key definitions, defined using *KEY can be invoked by pressing the function key together with **CTRL** (see **appendix C**). The function of each key is listed below, together with the equivalent * command, if applicable. For further details please refer to the command descriptions in section 11.

f0 *Commands

Allow BBC operating system commands to be called.

fi Help

Display on-screen help giving use of function keys.

f2 Call (*CALL)

Dial a telephone number. You may specify the actual number, or the name of an entry in the telephone directory. See *CALL for details of specifying telephone numbers.

f3 Connect (*CONNECT)

Attempt to put the modem on-line. This is normally used to connect the modem, after dialling manually.

f4 Screen dump (*SDUMP)

Print a full graphics screen dump of any Mode 7 screen, or a text dump of any other screen. The command *GROFF will cause it to print Mode 7 screens as text only, replacing any graphics with asterisks. This is useful to produce a faster dump, or for non-Epson compatible printers. **Please note that the screen dump facility is supplied in a ROM image which must be loaded from the Command utility disc (see page 16 for details).**

f5 Download (*DOWNLOAD)

Download file from modem to your computer using the CET protocol. You will be prompted for a filename, but pressing **RETURN** will save the file in the buffer.

f6 Put screen (*PSCREEN)

Open a file and save the current screen to disc. If no file name is given when prompted, the screen will be saved to the buffer. Once a file has been opened, further screens can be saved in the same file until the file is closed with **SHIFT f6** .

f7 Get screen (*GSCREEN)

Open a file and load screen. The file remains open until closed with **SHIFT f7**, so that further screens can be loaded from the same file. If no filename is given, screens will be loaded from the buffer.

18 Viewdata editor (*VEDIT)

Enter the editor. Please refer to section 9 for further details.

f9 Exit terminal (*BASIC)

Return to Basic or the language from which the terminal was called.

SHIFT 0 Alter baud rate (*V21A, *V210, *V23A, *V230)

Alter baud rate setting. This key will toggle through the settings, displaying them on the status line at the bottom of the screen.

SHIFT 11 Display status (*STAT)

Display status screen. Please refer to section 10 for further details.

SHIFT f2 Enter directory (*DIRECT)

Enter telephone directory. Please refer to section 8 for further details.

SHIFT 13 Disconnect (*DISCONNECT) Terminate

a call and switch the modem off-line.

SHIFT f4 Graphics ON/OFF (*GRON/*GROFF)

Turn graphics screen dump ON/OFF. If ON, screens will be printed as a full graphics dump.

SHIFT f5 Send screen

Send current screen from current cursor position to the remote computer. Typically, this key is used for sending mailbox frames.

SHIFT f6 Close 'put screen' file (*PCLOSE)

Close the file opened for putting screens to disc/buffer.

SHIFT 17 Close 'get-screen' file (*GCLOSE)

Close the file opened for getting screens from disc/buffer.

SHIFT 18 Leave

Send *90# to leave Prestel.

SHIFT f9 Text Terminal (*TEXT)

Enter Text Terminal.

7. The Text Terminal

Overview

This terminal allows you to communicate with scrolling text services, such as Telecom Gold and hundreds of Bulletin Boards throughout the country. Text services normally transmit standard text characters that simply scroll up the screen, although some newer Bulletin boards specifically designed for the BBC Micro, do provide some colour and graphics. The terminal is also ideal for user-to-user communication, and sending files to friends and colleagues.

Entering the terminal

Before starting to use the Text Terminal, position the function key strip entitled Text Terminal above the red function keys on your computer. Make sure that *Command is positioned immediately above the red function key **f0**.

To get into the Text Terminal type:

```
*TEXT RETURN
```

This command (like all other commands) may be abbreviated with a full stop and can be preceded by the letter 'B' to prevent command name clashes with other software. See section 11 for further details. To leave the terminal press 19, and enter the Viewdata Terminal (described in section 6) press **SHIFT f9**.

Text Terminal screen display

If all is well you should now see the terminal front page, which is a blank screen with a status line at the bottom of the screen looking something like this:

```
TEXT      :Offline V230 . . .
```

This indicates that you are in the Text Terminal, and that Command is 'offline'. The baud rate standard is displayed next (V230), followed by three dots which will be replaced by the letters S, P and X when certain

features of Command are activated. These features (Spon, Pron and Xon) are described later.

O.S. Commands

At any time whilst you are in the terminal you can issue O.S. commands (* commands) by pressing **f0**, and typing in the command name followed by **RETURN**. All the facilities in Command as well as the usual disc and operating system commands, can be called in this way.

Many of commands are available by simply pressing the relevant function keys, but if you wish, you can call them by their full command names. For example, to download a program you can press **f5**, or alternatively press **f0** and type `DOWNLOAD RETURN` from the keyboard.

Text help screen

A help screen giving full details of the function key settings for the Text Terminal can be called up at any time by pressing **f1**. Press the required function *key*, or **ESCAPE** to clear the help screen and restore the previously displayed screen.

Setting the correct baud rate

To access Text services you may use the V23 or V21 standards, operating in originate mode. The V23 standard, which operates at a baud rate of 1200/75, is used in the Viewdata Terminal, so further information about it is given in section 3. The V21 standard operates at a baud rate of 300/300 full duplex, which means that the 'originate' modem is receiving data at 300 baud (approximately 30 characters per second) and also transmitting at 300 baud. If conversing directly with another modem, the other modem should be set to the corresponding 'answer' mode V21A.

Normally, therefore, Command should be set to V21O. If the status line at the bottom of the screen does not display V21O, then it can be selected by pressing **SHIFT f0** until it appears.

Auto-dialling

Once you have checked that the software is set to the correct baud rate, you can dial the telephone number. Press **f2** and enter the required number at the keyboard, then press **RETURN**. If you have already dialled a number since start-up, the previous number will be re-displayed should you want to re-dial it. To re-dial it just press **RETURN**, otherwise delete the previous number (use **CTRL U**) and enter the new number in full.

If the number you require is in the Command telephone directory, you can enter the name of the directory entry instead of the number (see section 8 for details of the telephone directory).

You should hear the dialling tones from the computer speaker as the number is dialled, and as soon as you are connected the message 'Offline' on the status line, will change to 'Online'.

Problems getting connected

If you have no success getting connected press **f2**, and check that the number displayed is correct. Try re-dialling the number by simply pressing **RETURN**. If you get no success after several attempts, check that the telephone lead is connected correctly, and that the baud rate is correct.

If you get 'online' but the characters you receive are corrupted, then it probably means that the standard or baud rate is incorrectly set. Remember that Text services operate at both 300/300 and 1200/75 baud, so it is important to check the correct baud rate before dialling.

Some telephone systems require a code (e.g. 9) to be dialled first for an outside line, and cannot dial the main number until a further dialling tone is received. If this is the case, try putting a colon (:) between the code and the main number. This will cause Command to dial the code, and then pause before dialling the main number.

Terminal functions

A full range of terminal functions are available from the function keys at the top of the keyboard. A key may be pressed on its own, or together with **SHIFT** to provide a specific facility. The normal function key definitions, defined using ***KEY**, can be invoked by pressing the function

key together with **CTRL** (see appendix C). The function of each key is listed below, together with the equivalent *command, if applicable. For further details please refer to the command descriptions in section 11.

f0 *Commands

Allow any * command to be called.

f1 Help

Display on-screen help giving use of function keys.

f2 Call (*CALL)

Dial a telephone number. You may specify the actual number, or the name of an entry in the telephone directory. See *CALL for details of specifying telephone numbers.

f3 Connect (*CONNECT)

Attempt to put the modem on-line. This is normally used to connect the modem, after dialling manually. For example, you may phone a friend manually and establish verbal contact, then use this function to type messages to each other. This is useful to establish that a good connection has been made before downloading software.

f4 Screen dump (*SDUMP)

Print a full graphics screen dump of any Mode 7 screen, or a text dump of any other screen. The **command *GROFF** will cause it to print Mode 7 screens as text only, replacing any graphics with asterisks. This is useful to produce a faster dump, or for non-Epson compatible printers. **Please note that the screen dump facility is supplied in a ROM image that must be loaded from the Command utility disc (see page 16 for details).**

f5 Download (*DOWNLOAD)

Download file from modem to your computer using the XMODEM protocol. You will be prompted for a filename, but pressing **RETURN** will save the file in the buffer.

f6 Spool ON/OFF (*SPON/SPOFF)

Toggle spooling ON/OFF. If spooling is ON, data received will be sent to the file specified or to the buffer if no filename is specified. Switching spooling off, does not dose the file, which must be done with **SHIFT f6**. When spooling is ON, the letter S is displayed on the status line at the bottom of the screen.

f7 Load buffer (*BLOAD)

Load file into buffer. This can be used before uploading (sending) files, since less errors occur when transmitting from the buffer, than transmitting directly from disc.

f8 XON/XOFF (*XON/*XOFF)

Toggle state of XON/XOFF. An X is displayed on the status line at the bottom of the screen if XON is active. Please refer to the command *XON for full details of this facility.

f9 Exit terminal (*BASIC)

Return to Basic or the language from which the terminal was called.

SHIFT f0 Alter baud rate (*V21A, *V21O, *V23A, *V23O)

Alter baud rate setting. This key will toggle through the settings, displaying them on the status line at the bottom of the screen.

SHIFT f1 Display status (*STAT)

Display status screen. Please refer to section 7 for further details.

SHIFT f2 Enter directory (*DIRECT)

Enter telephone directory. Please refer to section 5 for further details.

SHIFT f3 Disconnect (*DISCONNECT) Terminate

a call and switch the modem off-line.

SHIFT f4 Switch printer ON/OFF (*PRON/*PROFF)

Toggle printer ON/OFF. If ON, all characters received will be sent to the printer. When printer is on, a P is displayed on the status line at the bottom of the screen.

SHIFT f5 Upload file (*UPLOAD)

Upload (send) a file using the XMODEM protocol, to the modem. You will be prompted for a filename, but pressing RETURN will send the file from the buffer.

SHIFT f6 Close spool file (*SPCLOSE)

Close the file opened for spooling.

SHIFT f7 Save buffer (*BSAVE)

Save contents of buffer to disc. This can be used after downloading a file to the buffer.

SHIFT f8 Change mode

Toggle through the 40 and 80 column screen modes available on the BBC Micro. The text terminal can be used in any of these modes, although Mode 7 is recommended because it allows a greater buffer size.

SHIFT f9 Viewdata Terminal (*VIEWDATA)

Enter Viewdata Terminal.

User to user communication

One of the many uses of the Text Terminal is to allow easy transfer of files, via the phone line, to other computers. Before commencing ensure that the baud rate is set correctly for both the receiving and transmitting computers. The following table shows typical settings:

Software Setting		
Transmitting computer	1200 baud	V23A
Receiving computer	75 baud	V23O

These settings ensure that the file is being transmitted at the fast 1200 baud rate.

The best way to transfer a file is to establish the call in the usual way, and check that the other person is set up to transmit/receive the file. Both users should then use **f3** to go on-line and connect their modems. Anything typed at either end will be transmitted and displayed on the other users screen. This is useful to ensure that a good connection has been made. It may be useful to use ***ECHON** so that you can see what you are typing.

Once you are sure that a connection has been made, the user wishing to send the file should upload with **SHIFT f5**, and the person receiving should download with **f5**. Both users will be prompted for a filename, and the download will commence. An indication is given on the screen as blocks are successfully transferred, and a message is given when the process is complete. If errors occur, the system will automatically send blocks again.

It is much quicker and usually less error prone, to transfer and receive files using the buffer. To do this simply press **RETURN** when prompted for filenames. Of course, the person transmitting the file must have previously loaded the file into the buffer (using ***BLOAD**). Once the

transfer is complete, the person downloading will be automatically prompted for a filename with which to save the file. If **ESCAPE** is pressed without giving a name, the file will not be saved, but will remain in the buffer.

Split screen operation

This facility will split the screen in two parts, and display received data in one part, and transmitted data in the other. It is useful when you are connected to another terminal that does not echo its input. The echo window appears between the main window and the status line, and can be set up with the command *E C HON, or from the status screen.

8. Telephone Directory

Overview

The built in telephone directory in Command is one of the more unusual features of this package. It enables a name to be used in place of a number, whenever a call is made. So for example typing:

```
*CALL prestel
```

will look in the directory for the entry `prestel`, and automatically dial the number. The directory is held on a disc, which must be in drive 0 for the system to work. The directory can also contain other information related to the call, such as a sign-on string, the baud rate and the correct terminal to enter once connected. In fact, all the status settings described in section 10 can be saved in the directory, so that once you have successfully called a Bulletin Board, all information relating to that board can be saved in the directory. This allows easy recall with a simple ***CALL** command.

Getting started

To enter the directory from the Text or Viewdata terminals, press **SHIFT f2** or to enter from Basic type:

```
*DIRECT RETURN
```

The best way to create a new entry is to enter the correct terminal, set the baud rate and get on-line. This will ensure that when you make the directory entry, the status settings will be correct for the service required.

All the telephone numbers and other related information are stored in a random access file called `COMDIR`. When you enter the directory the first record is displayed on the screen. The top part of the *screen* contains general information relating to the directory entry, while the bottom part shows the status settings for that entry. If you are creating a new entry, the status settings will be set to the those current at the time.

Directory fields

The four main fields to be entered are:

Name

The name of the entry. This can be in upper or lower case, can be up to 12 characters long, and can contain spaces.

Number

The telephone number. This can contain the pause character `:` and spaces, dashes etc. to pad out the number (please refer to command `*CALL` for further details). For example:

```
9:01-618-1111
```

The number can be up to 16 characters long.

Sign-on

This is the string which will be automatically sent as soon as communication is established with the remote computer. Note that it uses exactly the same syntax as described in the `*SAY` command description for entering control codes and time delays. If your sign-on string is longer than the space available on the screen, complete the other fields as normal, then build a text file as follows:

```
*CALL name  
sign-on  
password
```

where `name` is the name of the directory entry, and `sign-on`, `password` etc. are the sign-on strings. To call the number type:

```
*EXEC filename
```

where `filename` is the name of the text file.

Terminal

This may have three values, VIEWDATA, TEXT and BASIC. It controls which terminal will be entered if a successful connection is made. Obviously, if set to VIEWDATA, the Viewdata Terminal will be entered and so on for TEXT. Selecting BASIC, will leave the terminal unchanged, so if the directory entry is called from Basic, the computer will remain in Basic. This is useful if you want to call numbers from Basic, without entering either of the terminals when connected.

Entering and editing an entry

Simply move the cursor, using keys | and | to the required field, and type in the information. Keys <- and -> will move the cursor to any position in the field, so that characters may be inserted, or deleted with **DELETE**. The field **TERMINAL** can be altered by pressing **V**, **T** or **'**.

The status section in the bottom part of the screen can be changed in the way described in section 10. To leave the directory, and save any new additions or updates, press **ESCAPE**.

Function key operations

The function keys at the top of the keyboard provide a number of useful functions.

f0 Call

Call the currently displayed directory entry. This will also update the file with any recent additions or alterations.

f1 Previous record

Display the previous record.

f2 Next record

Display the next record. If you are at the end of the file, use key f6 to create a new entry.

f3 Delete record

Delete the currently displayed record.

f4 Save status

This takes the current communications status settings (as seen using *STAT), and saves them in the current directory entry. Please note that this does NOT save the entry to disc.

f5 Load status

This configures the computer to the the settings held in the currently selected directory entry.

f6 New record

Create a new blank directory entry. The status part of the entry will be automatically set to the current machine status.

f7 Print record

Print the current screen. This will normally be a full graphics screen dump, but the command *GROFF will alter this to do a simple text dump. A text dump is much quicker in execution, and is compatible with almost all printers.

Example directory

An example telephone directory is supplied on the Command utility disc. The file is called COMDIR, and should be copied onto one of your own discs before use (your disc should not be write-protected). To examine the directory, ensure that the file COMDIR is on the disc in drive 0, and type *DIRECT (if you are in a terminal simply press **SHIFT f2**). Once loaded you will see the first entry in the directory, and using the function keys given above you may move around the directory, call a number, print an entry etc.

Please note that you will need to delete the 01 dialling code from all London numbers if you are dialling from London.

9. Viewdata editor

Overview

The viewdata editor is a powerful piece of software for designing Mode 7 teletext screens. It is beyond the scope of this manual to explain fully the workings of teletext graphics, but a very good explanation is given in your computer user guide. The editor can be used on-line to edit Viewdata frames, or off-line to create or edit your own frames.

Getting started

The editor is called from Basic or any other language by typing:

```
*VEDIT RETURN
```

You must be in screen mode 7 or 135, otherwise the error `Bad mode` will be generated. To enter the editor from the Viewdata Terminal press function key **f8**. Once called, the word `VEDIT` is displayed on the bottom line of the screen (the status line), but otherwise the existing display is preserved. To edit a previously saved frame, it is necessary to load the frame before entering the editor, using `*GSCREEN`, or the `Get screen` function from the Viewdata terminal. To clear the screen press **CTRL L**.

Simple cursor movement

The cursor control keys situated at the right hand side of the keyboard move the cursor around the screen. The cursor can be moved anywhere on the screen except the bottom line, and text simply typed in at the cursor position. Use **DELETE** in the usual way, to delete characters to the left of the cursor. There is wrap around in all directions, so if you go off one edge of the screen, the cursor will reappear at the opposite edge. The following keys may also be useful:

RETURN	move the cursor to the start of next line
SHIFT f9	home cursor (move cursor to top left of screen)
COPY	send character to remote computer (on-line only)
TAB	move cursor to next tab position (every 8 characters)

Teletext effects and on-screen help

Teletext colour codes, graphics and special effects are accessed by the 10 function keys at the top of the keyboard. The whole range of effects is available by pressing the keys on their own, or together with **SHIFT** or **CTRL**. An on-screen help facility which gives an abbreviated summary of all the effects available, can be displayed by pressing **f0**. The bottom help line corresponds to the function keys pressed on their own, and the lines above correspond to the function keys when used with **SHIFT** and **CTRL**. The help panel will automatically move to the opposite end of the screen, should you want to edit beneath it. To remove the help display completely, press **f0** again. The status line displays the character, or name of control code at the current cursor position.

Changing text colours

Pressing one of the function keys below inserts a colour code at the cursor position.

f1	Alphanumeric Red	(ard)
f2	Alphanumeric Green	(agr)
f3	Alphanumeric Yellow	(ayl)
f4	Alphanumeric Blue	(abl)
f5	Alphanumeric Magenta	(amg)
f6	Alphanumeric Cyan	(acy)
f7	Alphanumeric White	(awt)

The effect of these codes is to change the colour of all subsequent text up to the end of the line, or until another text or graphics code is reached.

Graphics colour codes

The following function keys are used to insert graphics colour codes.

SHIFT f1	Graphics Red	(grd)
SHIFT f2	Graphics Green	(ggr)
SHIFT f3	Graphics Yellow	(gyl)
SHIFT f4	Graphics Blue	(gbl)
SHIFT f5	Graphics Magenta	(gmg)
SHIFT f6	Graphics Cyan	(WY)
SHIFT f7	Graphics White	(gwt)

The effect of these codes is to cause all subsequent lower case characters to be displayed as graphics characters, in the specified colour. This remains in effect up to the end of the line, or until another text or graphics code is reached.

Other teletext effects

All the other usual teletext special effects are available from the following function keys.

f8	Flash	(Fsh)
f9	Steady	(Std)
CTRL f1	Normal height characters	(Nht)
CTRL f2	Double height characters	(Dht)
CTRL f3	Conceal display	(Cnl)
CTRL f4	Contiguous graphics	(Con)
CTRL f5	Separated graphics	(Sep)
CTRL f6	Black background	(Bbk)
CTRL f7	New background	(Nbk)
CTRL f8	Hold graphics	(Hid)
CTRL f9	Release graphics	(Rel)

Please refer to your computer user guide for full details of these teletext codes.

Copy editing

The Viewdata editor contains an editing system similar to the normal Basic editor, but using the cursor keys and COPY together with **SHIFT**.

SHIFT 	move copy cursor up
SHIFT 	move copy cursor down
SHIFT <-	move copy cursor left
SHIFT ->	move copy cursor right
SHIFT COPY	copy character to normal cursor
RETURN	finish copy editing

To copy text, use the key presses shown above to move the solid cursor block over the first character of the text to be copied. Then press **SHIFT COPY** to copy from the solid cursor block to the normal flashing cursor. If you have the help panel displayed, you can copy teletext control codes directly from it to the normal cursor position. To do this,

move the copy cursor onto the help panel and position it over the abbreviated word of the feature you require. Now simply press **SHIFT COPY** to copy the code to the normal cursor position.

Inserting/deleting lines and characters

The keys | and | together with **CTRL** are used to insert and delete lines.

CTRL 	delete line under cursor
CTRL 	insert blank line at cursor

All other lines are moved up or down the screen accordingly. To delete a line without affecting the rest of the screen type:

CTRL|T followed by **CTRL |**

The following key presses insert and delete characters, shuffling other characters on the same line left or right accordingly.

CTRL <--	delete character under cursor
CTRL -->	insert space at cursor

These are useful for centring text on a line. The above functions are strictly local, and will cause confusion if used on-line.

Using your own function key strings

Function key strings can be printed on the screen by pressing **SHIFT CTRL** and the appropriate function key. Function keys should be defined in the usual way, before entering the editor. For example:

```
10 *KEY5 abc
20 *VEDIT
```

This program defines function key 5, and then enters the editor. If **SHIFT CTRL f5** is pressed, then the string 'abc' is printed on the screen.

Pixel editor

The pixel editor is used to design graphics screens, by allowing you to turn on and off individual graphics pixels. It is entered by pressing **SHIFT f8**, and the word **P ix** is displayed on the status line as confirmation. Once entered the keys **Q, W, A, S, Z,** and **X** will toggle individual pixels within a character position, on and off.

Remember that to display graphics, you must have a graphics colour code somewhere on the current line to the left of the cursor. The editor does not clear a character block before editing, so editing a non-graphics character will cause unpredictable results. For further details of teletext graphics, please refer to your computer user guide. To leave the pixel editor press **SHIFT f8** or **ESCAPE**.

Exiting from the Viewdata Editor

If you **are** using the editor off-line, simply press **ESCAPE** to exit. There are two ways to leave the editor if you are on-line:

SHIFT f0	sends sequence Escape K to abandon edit
CTRL f0	sends sequence Escape J to end the edit

Saving and printing screens

The editor does not include options to load, save or dump screens, but these features can quite easily be added with a simple Basic program:

```
10 *GSCREEN pic1
20 *GCLOSE
30 *VEDIT
40 *PSCREEN pic2
50 *PCLOSE
60 *SDUMP
```

This simple program will load **pic1** for editing, and when editing is complete, save it as **pic2** and dump it to the printer. Of course, if you use the editor from the Viewdata Terminal, all these features are available at the press of a function key. An extended teletext editor called **TEDIT** is supplied on the Command utility disc. This is a Basic program that uses ***VEDIT** and a number of other Command facilities to provide the editor with load, save and dump options.

10. Status screen

Overview

The Command Rom's status screen can be displayed by typing:

***STAT RETURN**

or by pressing **SHIFT f1** from either of the terminals. It not only displays the status information, but also allows you to edit it on-screen. On entering the status display, the first status setting is highlighted in a different colour, and can be altered by pressing <- and ->. Other settings can be altered by using | and | to highlight them, followed by <- and -> to alter them. Press **ESCAPE** to leave the status screen.

Status settings

Listed below are all the settings on the status screen and their equivalent *commands (if applicable). A brief description is given explaining what the setting is used for, but refer to the command descriptions in section 11 for further details.

Transmit filter (*TXFILTER)

If the filter is on, all Return characters transmitted are expanded to include line-feeds.

Receive filter (*RXFILTER)

If this filter is on, all Return characters received are expanded to include line-feeds.

Transmit rate (*V21A/*V21O/*V23A/V23O)

Baud rate setting for transmitting data.

Receive rate (*V21A/*V21O/*V23A/*V23O)

Baud rate setting for receiving data.

Standard (*STANDARD)

A code representing the software standard.

Echo (*ECHON/*ECHOFF)

State of local echo window. If ON, it is followed by the size of the window.

Monitor (*MON/*MOFF)

State of monitoring. If ON, control codes will be displayed using the standard BBC bar I convention.

Xon/Xoff (*XON/*XOFF)

State of XON/XOFF protocol. If ON, this protocol ensures that one computer does not send data too quickly for another computer to receive.

Band (*BAND)

State of real time clock. Band 0 displays the normal clock, and bands 1 to 9 display the number of telephone units used.

Colour

Foreground and background colours. There is no * command equivalent, but the values are the same as those used by the Basic command VDU19.

Mode

Current screen mode. This is normally Mode 7, but the Text Terminal can be used in any 40 or 80 column mode. There is no * command equivalent, but the mode numbers are the same as those used by the Basic command **MODE**.

Printer (*PRON/*PROFF)

Printer state. If ON, all data received in the Text Terminal is sent to the printer.

Graphic (*GRON/*GROFF)

If this is ON, the command *SDUMP will produce a full graphics screen dump.

Retry (*RETRY)

The number of re-tries that will be attempted whilst downloading a block of data.

Rings (*RINGS)

The number of rings after which *ANSWER and *LISTEN will respond.

Buffer (*BCLEAR/*BLOAD/*BSAVE)

Buffer start address, end address, used memory and free memory. This information cannot be altered on the status screen, but the buffer start address can be altered with the command *BCLEAR. The other values change if the buffer is loaded or saved, or if the screen mode is changed.

11. Commands

Overview

This section describes in detail all the commands available in the Command software in alphabetical order, giving each command name, its function, syntax and an explanation of its use. Once you have become familiar with the operation of the commands, you may find it useful to refer to the command summary in **Appendix E** at the back of this booklet. If you type the following:

```
*HELP COMMAND RETURN
```

you will **see** a list of all the commands available. The list is quite long, so you may find it useful to turn paging on with **CTRL N** before using the help command.

All commands may be accessed by using star commands. This takes the form of an asterisk ***** followed by the command name, and then any parameters that are required. For example:

```
*DOWNLOAD utility
```

will download the file utility. The command name may be entered in either upper or lower case letters, so the following commands are all legal:

```
*DOWNLOAD utility  
*download utility  
*DOWNload utility
```

Commands may also be abbreviated with a full-stop, but the name must be at least three characters long. For example:

```
*DOW. utility
```

Although each command has its own unique command name, you may find that some of these clash with the names of commands in other software. Command has a special feature to resolve command name clashes. If, for example, you entered the command ***DOWNLOAD** and

found that it was intercepted by software other than Command, simply preface the command name with a B (for Beebug). For example:

```
*BDOWNLOAD utility
```

This will ensure that it is intercepted by Command rather than any other software.

Command parameters

Many of the commands require parameters to control their actions. The following types of parameters are used:

<time>	:a time in seconds
<number a-b>	:a number in the range a to b
<address>	:a valid address in memory 0-&7FFF
<filename>	:a valid disc filename
<ON/OFF>	:the strings ON or OFF

Numeric parameters may be specified in decimal, or in hex if preceded by an ampersand (&). Some parameters are optional, and are enclosed in double brackets. For example:

<<time>>

If an optional parameter is omitted from a command, then a sensible default value will be automatically used. If, however, a compulsory parameter is omitted then its value will be prompted for.

ANSWER

Syntax : *ANSWER <time>

Function: Answer the telephone and connect.

This command is used to make the computer answer the phone. The command will monitor the phone line for the given period, and if there is a call within this time it will answer the phone after the number of rings set by the command *RINGS (default 6). Once answered, it will try to connect to the computer making the call. If no calls satisfying this criterion are received during the time period, the command will simply return. If no parameter is supplied, the computer will continue monitoring the phone line until a call is received, or **ESCAPE** is pressed. Using this command we can write a very simple Bulletin Board program:

```
10 *STANDARD 5
20 *V23A
30 REPEAT
40 *ANSWER
50 *PAUSE 5
60 *SAY "No news is good news!"
70 *PAUSE 5
80 *DISCONNECT
90 UNTIL FALSE
```

Related Commands: CONNECT, LISTEN, RINGS

BAND

Syntax : *BAND <number 0-9>

Function: Select the band for the real time dock

This is used to control the clock that appears at the bottom right hand corner of the screen when either of the terminals are on line. If band 0 is selected, the clock will display the hours, minutes and seconds that have elapsed since going 'on-line'. Any other value will display the number of telephone units used and the number of seconds remaining in the current unit. The number of seconds for each unit is determined by the value of the band number:

BAND	0	real time clock
	1	360 seconds/unit
	2	100 seconds/unit

3	90 seconds/unit
4	60 seconds/unit
5	45 seconds/unit
6	34 seconds/unit
7	30 seconds/unit
8	24 seconds/unit
9	12 seconds/unit

The default band is 0.

Related commands: none

BCLEAR

Syntax : *BCLEAR «address»

Function: Clear buffer or define start of buffer

This command works in two ways. If used with an address, it will set the buffer to start at that address, and then clear the buffer. Without any parameter it simply clears the existing buffer. If the buffer is being used by another command, an error message will be displayed and the buffer will not be cleared. The main use of this command, is moving the bottom of the buffer up from its default value of PAGE so that a Basic program can be written using commands which use the buffer. The following is typical:

```
10 *BCLEAR 20000
20 HIMEM=20000
```

These two Basic lines could be used at the beginning of a program to set the buffer space above Basic program space, and to ensure that a Basic program can not overwrite the buffer. Commands that normally require a filename parameter, can be made to use the buffer by not specifying the filename, but only if the buffer is not already in use. The command *STAT can be used to display information about the buffer, including its start and end addresses.

Related commands: BDUMP, BLOAD, BSAVE, DOWNLOAD, GSCREEN, PSCREEN, SEND, SPON, STAT, UPLOAD

BDUMP

Syntax : *BDUMP

Function: Display the contents of the buffer

Lists the contents of the buffer on the screen in Hex and Ascii. The up and down cursor keys may be used to scroll backwards and forwards through the buffer contents. The screen layout of the dump is as follows:

Offset	Hex Dump	Ascii Dump
0000	41 42 43 00 00 00 00 00	ABC
0008	9A DE 00 0E 33 35 31 00351
0010	02 03 43 42 41 FF FF FF	..CBA

In the Ascii part of the dump, any codes outside the normal printable range are shown as dots. If the buffer is empty, just a single line (the first eight bytes) will be displayed. **This command is not in ROM, and must be loaded from the Command utility disc as described on page 16.**

Related commands: BCLEAR, BLOAD, BSAVE

BLOAD

Syntax : *BLOAD <filename>

Function: Load file into buffer

This loads the specified file into the buffer. If the file is too long to fit into the buffer, the error message `Buffer full` will be displayed, and the file will have to be accessed directly from disc.

Related commands: BCLEAR, BDUMP, BSAVE

BSAVE

Syntax : *BSAVE <filename>

Function: Save buffer contents

This command saves the buffer contents to disc with the filename specified.

Related commands: BCLEAR, BDUMP, BLOAD

CALL

Syntax : *CALL <telephone number/directory name>

Function: Auto-dial a phone number

This command may be followed by either a phone number which will be dialled, or a name which corresponds to an entry in the Command telephone directory (see *DIRECT). If a name is given, the corresponding number will be looked up in the directory and dialled in the usual way. Other information in the directory will be used to enter the correct terminal and send any sign-on codes. The two types of parameter are differentiated by whether they begin with a number or some other character. After the first character however, any characters may be used to pad out the number. For example:

```
*CALL PRESTEL
*CALL 016181111
*CALL 01-618-1111
```

After dialling, Command will attempt to connect the modem, and then return.

It is possible to introduce a short pause between dialling digits, by inserting a colon (:) in the number to be dialled. This may be of use when dialling abroad, or to allow the local exchange time to get an outside line. For example:

```
*CALL 9:016181111
```

Please note that British Telecom regulations state that using auto-diallers such as this, you should make the first retry after at least 5 seconds, the second after at least 1 minute, the third after at least 2 minutes, the fourth after another 2 minutes and then blacklist the number for 4 hours.

Related commands: CONNECT, DIRECT

CONNECT

Syntax : *CONNECT <time>

Function: Attempts to put modem on-line

This command will keep trying for the specified time to put the modem on-line. Issuing this command is equivalent to picking up the phone and establishing that a valid carrier tone is being received.

Related commands: DISCONNECT

DIRECT

Syntax : *DIRECT

Function: Enter Command telephone directory

Please refer to section 8 for full details of the telephone directory.

Related commands: CALL, STAT

DISCONNECT

Syntax : *DISCONNECT

Function: Terminate call and put modem off-line

This command hangs up the phone, terminating immediately any communication. It is normally used at the end of a call, or when the remote computer refuses to respond correctly. If at any time whilst the modem is on-line, 5 seconds elapse without a carrier being received, Command will automatically use this command to terminate the call.

Related commands: CONNECT

DISPLAY

Syntax : *DISPLAY «time» number 0-255»

Function: Display incoming data

Displays incoming data for a given specified time or until a terminating character is received, using the Text terminal output system. The second parameter specifies the Ascii code of the terminating character. A very simple terminal can be written using this command:

```
10 *STANDARD 5
20 *V23AO
30 REPEAT
40 INPUT A$
50 OSCLI ("SAY "+A$)
60 *PAUSE 2
70 *DISPLAY 20 13
80 UNTIL FALSE
```

Line 70 will display incoming data for 20 seconds, or until CHR\$(13) is received. The default time is 10 seconds.

Related commands: GRAB

DOWNLOAD

Syntax : *DOWNLOAD «filename»

Function: Load file from remote computer

This downloads a file giving it the filename specified, or if no filename is specified, puts it in the buffer. Normally, downloading to the buffer is quicker and more reliable than downloading to a file, and because the buffer usually starts at PAGE, you may leave the terminal once downloading is complete, type OLD, and run the program in the normal way. If you want to save the file in the buffer to disc, use the command *BSAVE.

This command uses two different protocols for downloading files. These are XMODEM (usually used for scrolling text systems), and the CET Telesoftware system (now known as Viewfax, and used by Prestel Micronet 800). If you download in the Text terminal, it will use the XMODEM protocol, and in the Viewdata terminal the CET protocol. From Basic the default protocol is XMODEM, but the command *FTP can be used to change this.

Command supports two versions of)(MODEM, the old checksum system, and the newer more reliable CRC system (see Appendix D for further details). It is compatible with systems using either version. However, if a Bulletin Board gives you the choice, select XMODEM CRC.

Related commands: BSAVE, FTP, UPLOAD

ECHOFF

Syntax : *ECHOFF

Function: Turn off local echo

This command turns off the local echo of everything typed at the keyboard. This is the default state, but echo can be turned on with the command *ECHON.

Related commands: ECHON

ECHON

Syntax : *ECHON <number 0-22>

Function: Turn on local echo

This turns on the local echo of everything typed in the Text terminal. If the parameter is 0, the characters will simply be echoed at the current cursor position. A non zero value, will open an echo window of the given depth at the bottom of the screen, and echoed text will appear there.

The default value is 0.

Related commands: ECHOFF

EQUALISER

Syntax : *EQUALISER <ON/OFF>

Function: Switch ON or OFF the V23 equaliser.

FTP

Syntax : *FTP <XMODEM/VIEWFAX>

Function: Set protocol for downloading

This sets the file transfer protocol to be used from Basic by the **DOWNLOAD** command. For example:

```
10 *FTP XMODEM
```

This command does not normally need to be used when downloading from within the Text or Viewdata terminals. See the command **DOWNLOAD** for further details.

On start-up the file transfer protocol is XMODEM.

Related commands: **DOWNLOAD**

GCLOSE

Syntax : *GCLOSE

Function: Close 'get' file

Close the file currently being used by the GSCREEN command. It is important always to close the file once you have finished using it.

Related commands: **GSCREEN**

GRAB

Syntax : *GRAB «time»

Function: Output Viewdata frames

This command outputs data from the modem for the specified time, using the Viewdata terminal output system. The main use for this is to allow a program automatically to log onto Prestel and access pages of data or information. For example, a program that looks up a share price each day, and saves it in a file. The following example will log onto Prestel, and save page 123456 in a file called EXAMPLE.

```
10 *STANDARD 2
20 *V230
30 *CALL 016181111
40 *GRAB
50 *SAY 44444444444
60 *GRAB
70 *SAY 4444
80 *GRAB
90 *SAY *123456_
100 *GRAB
110 *PSCREEN EXAMPLE
120 *DISCONNECT
130 PCLOSE
```

The default value for time is 10 seconds.

Related commands: DISPLAY

GROFF

Syntax : *GROFF

Function: Turn graphics dump off

This is used to control the type of screen dump produced by the command *SDUMP. If called, it will cause Mode 7 screens to be printed as text only, with any graphics characters being replaced with asterisks. This results in a consistently faster dump. It should also be used when dumping Mode 7 screens to 'non Epson compatible' printers.

Related commands: GRON, SDUMP

GRON

Syntax : *GRON

Function: Turn graphics dump on

This command causes *SDUMP to produce full graphics dumps of Mode 7 screens. This is the default mode.

Related commands: GROFF, SDUMP

GSCREEN

Syntax : *GSCREEN <filename>

Function: Get screen from file

This displays a screen from a specified file, or from the buffer if no filename is given. This command makes use of the fact that *PSCREEN can save a whole series of Mode 7 screens into a single file. After a screen has been displayed, the file remains open so that further screens can be displayed from it. When the end of the file is reached the file is automatically closed, although it may be dosed at any time with the command *GCLOSE. The following program gives a continuous carousel display of screens in the file TEST:

```
100 MODE 7
110 REPEAT
120 *GSCREEN TEST
130 *PAUSE 5
140 UNTIL FALSE
```

The following program will display all the screens in the file, then end:

```
100 MODE 7
110 C%=OPENIN"TEST":CLOSE#C%
120 REPEAT
130 *GSCREEN TEST
140 *PAUSE 5
150 UNTIL EOF#C%
160 *GCLOSE
```

Even more useful is the ability to display any individual screen from a file. This program will continuously prompt for screen numbers and display the selected screens. To exit from the program, enter a screen number of 0.

```

100 MODE 7
110 C%=OPENIN"TEST":CLOSE#C%
120 REPEAT
130 *GSCREEN TEST
140 *PAUSE 5
150 INPUT TAB(0,0)"Screen : "N%
160 IF N%>0 THEN PTR#C%=(N%-1)
*960 170 UNTIL N%=0
180 *GCLOSE

```

It is important to close files once you have finished using them. Please note that although line 110 appears to be redundant, it returns the file channel in C %. The value 960 in line 160 is the length of a screen saved by the command ***PSCREEN**.

Related commands: GCLOSE, PSCREEN

LISTEN

Syntax : *LISTEN <time>

Function: Monitor the phone line

Like ***ANSWER**, this command monitors the phone line for the given time, or until the number of rings specified by the command ***RINGS** is received. However, this command does not answer the phone, instead it just returns to Basic. This can be useful if you want to speak to the caller, rather than immediately connect.

Related commands: ANSWER, RINGS

MOFF

Syntax : *MOFF

Function: Switch off monitoring

Switches off monitoring if it has been enabled by ***MON**.

Related commands: MON

MON

Syntax : *MON

Function: Switch on monitoring

Normally, all Ascii characters received by the Text Terminal are printed. However, this is not desirable if strange control codes are received which may possibly upset the terminal display. This command filters out control characters with an Ascii value of less than 32, or greater than 127, and displays them using the standard BBC bar I convention.

character 1 = |A
character 2 = |B
character 3 = |C
etc.

A useful side-effect of this command can be seen when downloading software (and also when uploading, if *ECHON is used). It will display both the data bytes, and the synchronisation bytes being sent and received by the XMODEM file transfer software. This is very useful, since if repeated problems are encountered when downloading or uploading files, this makes it possible to examine exactly what is being transferred (see **Appendix D** for full details of XMODEM).

Related commands: MOFF

PAUSE

Syntax : *PAUSE «time»

Function: Introduce a pause

This command introduces a pause for the duration specified. The duration should be specified in seconds, and the default value is 5 seconds.

Related commands: none

PCLOSE

Syntax : *PCLOSE

Function: Close 'put' file

Close the file currently being used by the **PSCREEN** command. It is important to close a file once you have finished using it.

Related commands: PSCREEN

PROFF

Syntax : *PROFF

Function: Switch printer off

Cancels the effect of *PRON.

Related commands: PRON

PRON

Syntax : *PRON

Function: Switch printer on

This command sends all data received in the Text Terminal to the printer.

Related commands: PROFF

PSCREEN

Syntax : *PSCREEN <filename>

Function: Put screen to file

This command will save the current screen to the specified file, or to the buffer if no name is specified. After saving, the file remains open so that further screens can be saved in the same file. Screens saved in this way can be re-displayed with the command *GSCREEN. Although primarily intended to save Mode 7 screens, this command will save screens in any mode.

Please note that this command shares a channel with *SPON, so if a spool file is open, screens will be saved to that file. The file should always be closed after use with the command *PCLOSE.

Related commands: GSCREEN, PCLOSE, SPON

RETRY

Syntax : *RETRY <number 1-255>

Function: Set number of re-tries for downloading

If data is corrupted during downloading, an error will occur, making it necessary to re-load the last block. This command sets the number of re-tries that will be attempted, and can take any value between 1 and 255. If the block has not downloaded successfully after the specified number of re-tries, you will be asked whether you want to continue trying.

The default number of retries is 10.

Related commands: DOWNLOAD

RINGS

Syntax : *RINGS <number 1- 255>

Function: Set number of rings for auto-answer

This sets the number of rings after which *ANSWER and *LISTEN will respond. The default value is 6.

Related commands: ANSWER, LISTEN

RXFILTER

Syntax : *RXFILTER <ON/OFF>

Function: Set filter for received data

This controls the filter that is applied to all data received. When the filter is ON, all Return characters (CHR\$13) received will be expanded to include line-feeds (CHR\$10). On start-up the filter is OFF.

Related commands: TXFILTER

SAY

Syntax : *SAY <string>

Function: Send string to modem

This command is used to send a string to the modem. In its simplest form it can be used to send a sentence:

```
240 *SAY "Good afternoon"
```

It uses the standard BBC bar I convention so that control codes may be sent. The following example sends two Carriage Return characters after the string:

```
240 *SAY "Good afternoon|M|M"
```

The command has also been extended to allow time delays to be introduced into the string. This can be useful at the beginning of log-on sequences for some databases and Bulletin Boards. The symbol % in the string followed by a number will introduce a delay of the corresponding number of seconds:

```
240 *SAY "%5identification%10|234765"
```

Notice here that after introducing the 10 second delay, an extra bar is inserted before the password 234765 to prevent confusion between the delay and the password. A % character can be transmitted by putting two of them together in the given string. Please note that to send the character # to Prestel you must actually send an underline character _. This is because Prestel uses a non-standard character set, and is demonstrated in the example for the command *GRAB.

Related commands: none

SDUMP

Syntax : *SDUMP

Function: Dump screen to printer

This command prints a full graphics screen dump of Mode 7 screens, or a text dump of all other screens. The graphics dump is suitable for all Epson compatible printers. The command *GROFF will cause this command to print a text dump of Mode 7 screens, replacing graphics with asterisks. This is useful for producing quicker Mode 7 dumps, and for users without Epson compatible printers. This command is not in ROM, and must be loaded from the Command utility disc as described on page 16.

Related commands: GROFF, GRON

SEND

Syntax: *SEND <filename>

Function: Send file to modem

This will transmit the given file, or the contents of the buffer if no filename is specified. This is a much more error-prone technique for sending a file than using the XMODEM protocol. For this reason it should be used for sending instructions, messages etc. rather than programs or important files. The XON/XOFF protocol is also useful in ensuring that data is not sent faster than it can be received.

Related commands: XOFF, XON

SPOFF

Syntax : *SPOFF

Function: Switch off spooling

This switches off spooling of all received text. It does not actually close the pool file, therefore allowing you to re-start spooling again with the command *SPON.

Related commands SPON, SPCLOSE

SPON

Syntax : *SPON <filename>

Function: Switch on spooling

This switches on spooling of all received text. The text is spooled to the file given, or to the buffer if no filename is specified. Once the file is open, this command can be used to re-enable spooling if this has been switched off with the *SPOFF command. Please note that this command uses the same filing system channel as *PSCREEN.

Related commands: SPOFF, SPCLOSE

SPCLOSE

Syntax : *SPCLOSE

Function: Close spool file

This command closes the spool file opened by the command *SPON.

Related commands: SPOFF, SPON

STANDARD

Syntax : *STANDARD <number 0-7>

Function: Set software standard

This sets the standard used for the transmission and reception of data i.e. the parity, number of stop bits, and the number of bits sent for each character. There are eight possibilities allowed by the Master:

- 0 7+2 bits even parity
- 1 7+2 bits odd parity
- 2 7+1 bits even parity
- 3 7+1 bits odd parity
- 4 8+2 bits null parity
- 5 8+1 bits null parity
- 6 8+1 bits even parity
- 7 8+1 bits odd parity

Related commands: none

STAT

Syntax : *STAT

Function: Display and edit status information.

Please refer to section 10 for full details of this command.

Related commands: none

TEST

Syntax : *TEST <ON/OFF>

Function: Switch ON or OFF the modem test mode.

This command switches on or off the modem test mode. When switched on, the modem will echo back any typed text.

TEXT

Syntax : *TEXT

Function: Enter the Text Terminal

Please refer to section 7 for full details of the Text Terminal.

Related commands: VIEWDATA

STONE

Syntax : *STONE <ON/OFF>

Function: Switch ON or OFF tone dialling.

TXFILTER

Syntax : *TXFILTER <ON/OFF>

Function: Set filter for transmitted data

This controls the filter that is applied to all data that is transmitted. When the filter is ON, all Return characters transmitted will be expanded to include line-feeds. On start-up the filter is OFF.

Related commands: RXFILTER

UPLOAD

Syntax : *UPLOAD <filename>>

Function: Transmit a file using XMODEM

This command is used to send the given file to the modem using the XMODEM protocol. If no filename is specified, then the contents of the buffer are sent. After the command is issued, the remote computer has 60 seconds in which to start the file transfer. If nothing is heard within this period, the command will terminate with the error `Timeout`. If the remote computer sends 5 `CAN` characters in a row, the command will end with the error `Remote Escape`. Please refer to Appendix D for full details of the XMODEM protocol.

Related commands: DOWNLOAD

V21A

Syntax : *V21A

Function: Set standard V21A

This sets the transmit and receive baud rates to the V21 Answer standard. In this, data is transmitted and received at 300 baud.

Related commands: V21O, V23A, V23O

V21O

Syntax : *V21O

Function: Set standard V21O

This sets the transmit and receive baud rates to the V21 Originate standard. In this, data is transmitted and received at 300 baud.

Related commands: V21A, V23A, V23O

V23A

Syntax : *V23A

Function: Set standard V23A

This sets the transmit and receive baud rates to the V23 answer standard. In this, data is transmitted at 1200 baud and received at 75 baud. This standard is typically used by computers running Bulletin Boards since it has the advantage for the user, of fast sending of data.

Related commands: V21A, V21O, V23O

V23O

Syntax : *V23O

Function: Set standard V23O

This sets the transmit and receive baud rates to the V23 originate standard. In this, data is transmitted at 75 baud and received at 1200 baud. This command may be used for contacting Prestel or similar computers.

Related commands: V21A, V21O, V23A

VEDIT

Syntax : *VEDIT

Function: Enter the Viewdata Editor

Please refer to section 9 for full details of this command.

Related commands: none

VIEWDATA

Syntax : *VIEWDATA

Function: Enter the Viewdata Terminal

Please refer to section 6 for full details of the Viewdata Terminal.

Related commands: TEXT

XOFF

Syntax : *XOFF

Function: Switch off XON/XOFF protocol

This command switches off the XON/XOFF protocol set by the command *XON.

Related commands: XON

XON

Syntax : *XON «number 1-245» «number 1-245»

Function: Switch on XON/XOFF protocol

This command switches on the XON/XOFF protocol. XON/XOFF, is a protocol which is used to ensure that one computer does not send data too quickly for another computer to handle. A typical example is when the computer receiving a file, has to break off to put the file on disc. When one computer wants the other to stop sending data, it sends the XON character 17, and when it wants to resume, it sends the XOFF character 19. The two parameters for this command, are the number of characters in the input buffer when the XON and XOFF characters are sent. The obvious limitation, is that the number for the XON character (the first parameter) must be less than that for the XOFF character. The XON and XOFF characters are sent automatically when the correct number of characters are in the buffer, so do not send them manually or you will confuse the software.

Related commands: XOFF

12. Bulletin Board

The Ghost Host

The Ghost Host is a host or bulletin board system for the Master 128. It can be used as an answering machine, as your own private bulletin board, or simply to allow you to transfer files between machines without repeatedly having to run across the room. To use the Ghost Host you must have your Master Modem and Command ROM installed. The Command ROM has over 50 commands which provide support for writing customised communications software, and in fact the Ghost Host just begins to exploit the facilities provided by Command.

A bulletin board should provide at least downloading and uploading of programs, and sending and receiving messages. These are exactly the options provided by the Ghost Host.

Setting up your own bulletin board

To run your own bulletin board copy the file `GHOST` from the Command utility disc to a disc of your own. Next, create an ASCII file called `MESSOUT` containing any information or messages that you want people logging on to your system to read (you can use most wordprocessors for this). In addition, you may want to put other files on your discs for downloading. It would be sensible to lock all the files (on all drives) to stop them from being accidentally erased.

To run the program, ensure the disc containing the file `GHOST` is in drive 0, and type `CHAIN"GHOST"`. What happens next, is that Ghost waits until a call is received. When this happens, the Ghost Host will answer the phone and, assuming that there is a computer at the other end, begin talking to it. You will see the transmitted text from the Ghost Host and the responses from the other end appear on your computer's screen.

Looking at things from another point of view, what happens if you call up the Ghost Host? After dialling the correct number, and going on-line you will be presented with a welcome message and asked to enter the password for the particular host. You have three chances at this; if you fail to get it right, you are automatically logging off. The password is set

to **PASSWORD** by default at line 1080 of the program **GHOST**. After a successful log-on, you will see the Ghost Host menu:

D) ownload R) ead messages
U) pload L) eave messages
G) oodbye

Each option is selected by typing the appropriate letter followed by **RETURN**. Of these, Uploading and Downloading are fairly obvious. Files are transferred using **XMODEM**, and you must remember to press the Upload/Download function key after telling the Ghost what you are going to do. If you opt to read the messages file, you will have the contents of the file **MESSOUT** typed out on your screen. The 'Leave message' option, lets you type in lines of text which are appended to the end of the file **MESSIN**. Pressing **RETURN** twice, terminates this process. The owner of the host, can ***TYPE** out this file later to see your message. Finally, the 'Goodbye' option terminates your session on the Ghost Host, causing it to log you off and drop the line.

Customising your bulletin board

The program presented here is only a skeleton; with a little imagination, you should be able to add lots more features. Here are some ideas that you might like to explore:

*It would be nice to have a way of stopping and starting the output of the message file. This can be achieved by putting ***XON** in line 545. The user can then halt things by typing **CTRL S**, and restart output with **CTRL Q**, inserting his/her own text between the two.*

Call logging. By using the real-time clock in the Master, it should be easy to write to a file the time the host was accessed and for how long.

Change the log-on system so that anyone can become a user by leaving their name. You can then use call logging to see who uses the system the longest, and what they download.

Extend the message system, so that individual users have separate mail files, and can send messages to each other.

Provide special interest areas, each with its own message files and downloadable programs.

Add an option to the main menu to display a catalogue of the programs available for downloading.

Add teletext colour to the messages sent by the host.

Use the real time clock to give messages like the current time, and how long someone has been connected.

Continuing along these lines, you could easily write a full-scale bulletin board. Finally, Command also provides many of the facilities needed to run your own Viewdata host.

Appendix A

Error Messages

Command can generate the following error messages and numbers:

Offline! 100

This error is given either when you try to do something for which the terminal must be on-line when it is not, or when the terminal goes off-line whilst in the middle of doing something.

Block Synch 101

This error is given when the downloader finds that the remote computer has got out of synchronisation. For example, it is sending block number 3 when your computer wants block number 2.

Remote Escape 102

This is given by the XMODEM uploader when it receives 5 CAN characters in a row. This is usually used to signal that the remote computer wants to abort the file transfer.

Timeout 103

This is given by the uploader if no attempt is made to download a program for 60 seconds.

Load failed 104

This is given when a download is terminated by answering N to the 'Continue trying Y/N' prompt. This applies to XMODEM and Telesoftware downloading.

Buffer in use 105

This error is generated if you try to clear the buffer while it is being used by another command.

Not found 106

The commands ***BLOAD**, ***GSCREEN**, ***SEND** and ***UPLOAD** generate this error if the specified filename cannot be found. It is also given if ***CALL** cannot find a specified entry in the telephone directory.

Bad mode **107**

This is given if ***VEDIT** is called in a screen mode other than Mode 7.

Xon>Xoff **108**

This error is given by the command ***XON**, if the second parameter specified is smaller than the first. See description of the command ***XON** for further details.

Buffer full **109**

This is given if you try to load a file with ***BLOAD**, that is too long to fit into the buffer.

Bad number **110**

An attempt has been made to dial an invalid number.

Appendix B

OSWORD calls

Command supports a number of OSWORD calls. In some cases they provide facilities impossible to get in any other way; in others they provide packaged versions of routines.

OSWORD calls can be used by calling OSWORD at &FFF1 with &7B in the accumulator. The X and Y registers should point to a parameter block. The first byte of this must contain the service number 1...6. The services are as follows:

1 - status

On entry: A=&7B
 XY+0=1

On exit: XY+0=status byte

The status byte provides information about the status of Command. The bits have the following meanings:

- bit 0: set=online, not set=offline
- bit 1: set=XOFF character sent
- bit 2: set=XOFF character received
- bit 3: set=carrier present, not set=no carrier

2 - Put byte

On entry: A=&7B
 XY+0=2
 XY+1=byte to be sent

On exit: undefined

This routine sends a given byte to the modem.

3 - Get byte

On entry: A=&7B
XY+0=3

On exit: XY+0=byte
XY+1=255 if byte valid,
0 if byte not valid.

This routine attempts to get a byte from the modem. It returns the byte and a flag indicating success or failure.

4 - Put string

On entry: A=&7B
XY+0=4
XY+1=length of string 1..254
XY+2=string
XY+...

On exit: undefined

This routine sends a string to the modem.

5 - Get string

On entry: A=&7B
XY+0=5

On exit: XY+0=length of string 0..254
XY+1=string
XY+...

This routine attempts to read as long a string as possible from the modem.

6 -Read string from remote computer

On entry: A=&7B
 XY+0=6
 XY+1=maximum length of string
 XY+2=maximum time low byte (in centi-seconds)
 XY+3=maximum time high byte (in centi-seconds)

On exit XY+0=length of string
 XY+1=string
 XY+...

This is a general string input routine. It should be compared with the standard OSWORD call 0. Whereas that routine inputs a line of text from the keyboard, this routine inputs the text from a remote computer. Obviously, this may well have a keyboard connected to it. The routine will return when a RETURN (CHR\$13) is received. However, the routine also has a built in time out feature, and if RETURN is not received within the time given in the parameter block, it will produce timeout error 103.

Most importantly, all characters received by the routine are echoed back to the remote computer. DELETE (CHR\$(127) is supported correctly and RETURN is echoed with a line feed (CHR\$10). If the maximum string length given in the parameter block is reached, further characters will not be accepted; instead a beep (CHR\$7) will be sent back to the remote computer. The typical application of this routine, is Bulletin Board string entry.

General notes on OSWORD calls

When passing parameters to Command routines, you should note that locations 0 to &81 inclusive are not available for this purpose.

Using service 1, we can write a simple Basic function to determine when the modem is online as follows.

```
1000 DEF FNONLINE
1010 A%=&7B:X%=&82:Y%=0
1020 ?&82=1
1030 CALL &FFF1
1040 =?&82 AND 1
```

Appendix C

Terminal functions in *EXEC files

Although Command is totally command driven, it is possible to drive the terminals using a *EXEC file to automatically execute a series of function key presses. The file can be created using the command *BUILD, and executed with *EXEC from within one of the terminals. Each function key has its own unique code:

f0 - ~a	SHIFT f0 - ~A
f1 - ~b	SHIFT f1 - ~B
f2 - ~c	SHIFT f2 - ~C
f3 - ~d	SHIFT f3 - ~D
f4 - ~e	SHIFT f4 - ~E
f5 - ~f	SHIFT f5 - ~F
f6 - ~g	SHIFT f6 - ~G
f7 - ~h	SHIFT f7 - ~H
f8 - ~i	SHIFT f8 - ~I
f9 - ~j	SHIFT f9 - ~J

The following example will call Prestel, sign-on with an ID and password, select a page, save the frame to disc, and finally log-off.

*BUILD example	open build file called 'example'
~c01-618-1111	call Prestel
~aPAUSE	introduce a short pause
ABCDEFGHIJ1234*50000	send ID, password, and page No.
~aGRAB 30	display incoming characters
~gscreen1	save frame as 'screen1'
~G	dose file
~I	leave prestel
ESCAPE	exit from build utility

Once you have 'built' this file, enter the Viewdata Terminal, press 0 , and type: EXEC example **RETURN**

Using the facilities described above, it is possible to execute any * command from a function key. For example:*KEY0~c01-618-1111 |M will call Prestel when **CTRL f0** is pressed.

Appendix D

XMODEM explained

XMODEM is a protocol for sending files over telephone lines which was invented by Ward Christensen in August 1977. For this reason, it is sometimes called the Christensen protocol. XMODEM works by splitting the file to be transmitted into a number of 128 byte blocks. Why 128 bytes? Because the original implementations were done on CP/M machines, which used a record length of 128 bytes. If your file is not an exact multiple of 128 bytes long, then it will be padded out with nulls until it is.

Each block of 128 bytes is surrounded by a number of other bytes which are used by XMODEM to ensure that the file is not corrupted during transmission. The first byte in each block is CHR\$ 1, which is a SOH (start of header) byte. This is used by XMODEM to recognise the start of the block. This is followed by two bytes which are the block number and the result of exclusive-ORing it with 255. The block number starts from 1 and wraps around if a file has more than 255 blocks. Following these bytes are the 128 bytes of data.

What comes after the data depends on which version of XMODEM is in use. In the older version, the data is followed by a single byte checksum formed by adding together all the data bytes. In more recent implementations, this byte has been replaced by two bytes which contain a CRC (cyclic redundancy check) of the data bytes.

XMODEM is a receiver driven protocol. This means that the file transfer is controlled by the receiving end not the transmitting one. The transmitting program simply does its best to respond to the receiver. If the receiver gets a valid block (i.e. the checksum or CRC is good and the block number etc. is correct), it sends an **ACK** (acknowledge) character to the transmitting program, which will then send the next block. If there is an error in a block, the receiver send a **NAK** (negative acknowledge character), and the transmitter resends the block. When the end of the file is reached, the transmitter sends an **EOT** (end of transmission) character.

All that remains, is the problem of how the receiver gets the transmitter to send the first block. It can do this in two ways, either by sending a

NAK, or a **C** (CHR\$ 67). If it sends a **C**, then the transmitter should use the new (CRC) version of **)(MODEM**, otherwise the old checksum version should be used. This scheme ensures compatibility between the two versions. If the receiver starts by sending a few **Cs**, and gets no response, it can then assume that the transmitter is only able to use the checksum version of **XMODEM**, and can change over to sending **NAK's**.

The worst thing that can happen during an **XMODEM** transfer, is that noise on the line can appear to the transmitter as an **ACK**. It will then move on to sending the next block even though the receiver may not have successfully received the previous one. There is no way to recover from this situation, and the file transfer must be abandoned. Many implementations of **)(MODEM** (but not all) provide a mechanism whereby the receiver can tell the transmitter to abandon the file transfer, by sending a few **CAN** (cancel) characters.

It is possible to get into the situation where the receiving program has ended, but the transmitter has not. To get out of this, you can try sending some **CAN's**, and if this fails sometimes **CTRL C** will stop the transmitter. If neither works, most **XMODEM** transmitters have a 60 second timeout. The following lists some of the codes mentioned above, and how to produce them from the keyboard.

	CTRL	Dec	Hex
SOH	@	0	0
ACK	F	6	6
NAK	U	21	15
CAN	X	24	18
EOT	D	4	4

If you have trouble with **XMODEM** file transfers, it can be useful to see what is going on by enabling **MON** and **ECHON**. The contents of the above table will also be useful, since control characters will shown by the character preceded by a vertical bar.

Appendix E

Command summary

	Page
*ANSWER «time»	51
*BAND «number 0-9»	51
*BCLEAR «address»	52
*BDUMP	53
*BLOAD <filename>	53
*BSAVE <filename>	53
*CALL <phone number/directory name>	54
*CONNECT «time»	55
*DIRECT	55
*DISCONNECT	55
*DISPLAY «time>> «number 0-255»	56
*DOWNLOAD «filename>>	56
*ECHOFF	57
*ECHON <<number 0-22>>	57
*EQUALISER <ON/OFF>	58
*FTP <XMODEM/VIEWFAX>	58
*GCLOSE	58
*GRAB «time»	59
*GROFF	59
*GRON	60
*GSCREEN <<filename>>	60
*LISTEN «time»	61
*MOFF	61
*MON	62
*PAUSE «time»	62
*PCLOSE	63
*PROFF	63
*PRON	63
*PSCREEN «filename»	64
*RETRY <<number 1-255>>	64
*RINGS «number 1-255»	64
*RXFILTER <ON/OFF>	65
*SAY <string>	65
*SDUMP	66
*SEND «filename»	66
*SPOFF	66

*SPON «filename»	67
*SPCLOSE	67
*STANDARD <number 0-7>	67
*STAT	68
*TEST <ON/OFF>	68
*TEXT	68
*TONE <ON/OFF>	68
*TXFILTER <ON/OFF>	68
*UPLOAD «filename»	69
*V21A	69
*V21O	69
*V23A	70
*V23O	70
*VEDIT	70
*VIEWDATA	70
*X O FF	71
*XON «number 1-245» «number 1-245»	71

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Dolphin Place, Holywell Hill, St. Albans, Herts. AL1 1EX, England
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