

K.D.S ELECTRONICS

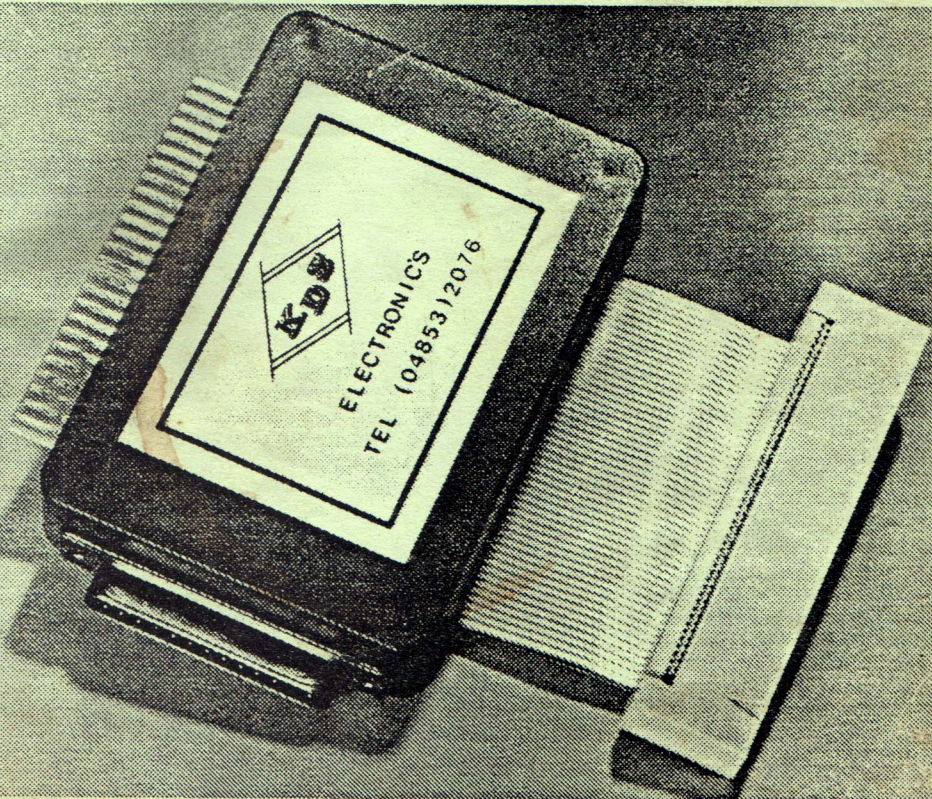
CPC

SERIAL INTERFACE

WITH

COMMS PACK 5

SOFTWARE



PREFACE

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The world of communications is highly complex and so we have produced a general purpose software package which, although sophisticated and comprehensive, is not designed for any specific aspect of communications.

It is assumed that the user is familiar with basic programming techniques and we have included over fifty Bar Commands to enable the user to tailor the program to meet their own needs.

Whilst painstaking efforts have been made to ensure that this software works as described, it is not possible to test this, or any program, under all possible conditions. Therefore no warranty is given, either expressly or implied, with this software.

It is recommended that the user reads the manual thoroughly before trying the package "hands on".

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*           K.D.S Electronics.
*           SERIAL INTERFACE
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***** CONNECTING TO THE COMPUTER *****

- A. Disconnect the computer from the mains and remove any peripherals from the expansion port.
- B. Connect the ribbon cable connector to the expansion port. And the "D" connector from your (Modem, Computer, Printer, ect.)
- C. Reconnect the computers mains supply and switch on. At this point the computer should power up with the usual Amstrad message followed by:

Is SERIAL INTERFACE to be used Y/N ?

If the display is not correct then turn the power OFF and check ALL the connections, then power up again.

If you answered N to the prompt then the normal BASIC message will appear and the computer can be used as normal, the interface does however still take a small ammount of memory and give the user Extra facilities as explained at the back of this manual.

If Y was entered then the FULL facilities of the software and interface are available to the user, this does however take up approx 7500 bytes of memory for its storage space, the display will now show:

K.D.S.ELECTRONICS
PRESENTS
COMMS PACK 5

- D. As a direct command type in ¶MENU and press the ENTER key. The screen will clear and all the bar commands will be displayed.
You are now ready to familiarize yourself with the system.

PLEASE NOTE. The BAR COMMANDS are EXTENSIONS to the AMSTRAD BASIC Commands and can be entered using the @ key (RIGHT OF THE P KEY) with the SHIFT key held down. In this manual the ¶ character will represent the BAR sign. Eg: ¶MODEM

In this manual reference is made to selecting DISC or Tape. However, built into the software is a detection routine to see if you are using Disc or Tape. If your computer is CPC464 without a Disc drive the software always defaults to TAPE. If the computer has a disc drive then the software defaults to DISC drive.

To change the default setting you can still use the option in COMMS (Disc Lock).

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*****
*
*   A GUIDE TO USING THE MENU DRIVEN OPTIONS   *
*
*****

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Type in \$MODEM and press the ENTER key to enter into the menu driven option routine.

First Menu...

***** K.D.S. ELECTRONICS *****

P = PRESTEL
 B = BULLETIN BOARD
 E = ELECTRONIC MAIL
 U = USER DEFINE
 T = TEXT EDIT
 D = PHONE DIRECTORY

CTRL & TAB to EXIT

Selecting the first letter in case of P,B,E will preset the BAUD rate and DATA word, (length,parity and stop bits).

	BAUD		DATA WORD		
	TRANSMIT	RECEIVE	LENGTH	PARITY	STOP
PRESTEL	75	1200	7	EVEN	1
BULLETIN BOARD	300	300	8	NONE	1
ELECTRONIC MAIL	300	300	7	EVEN	1

After selecting one of the above options the following menu is displayed.

A = AUTO-ANSWER
 D = AUTO-DIAL
 C = COMMUNICATIONS

CTRL & TAB to EXIT

Entering A will display

** IN AUTO ANSWER MODE **

CTRL & TAB to EXIT

The program will answer a ringing on the CTS input of the interface. It will then listen for carrier tone from the calling modem and if one is heard will then go into the COMMUNICATIONS mode (please note that a noisy line can some times be seen as a carrier). Should a carrier not be detected the call will be terminated and the program will return to the above menu.

Menu Driven Options Continued.

Entering D will display

**** AUTO DIAL ****

****** Press ENTER after LAST digit ******

ENTER NO:-

CTRL & TAB to EXIT

Any number of digits upto and including 16 can be entered. Correction of an entry is performed by using the DEL key. Pressing the ENTER key after the LAST digit has been entered will activate the DIAL routine.

While DIALLING is taking place the digit being dialled will be displayed and the telephone line pulse relay may also be heard operating.

When the last digit has been dialled the screen will display.

***** WAITING FOR ANSWER *****

CTRL & TAB to EXIT

If an answer is received the program will wait for a CARRIER, on receipt of a CARRIER the COMMS mode is selected. COMMS mode refers to screen to screen communication. An ANSWER but no CARRIER will cause a return to the AUTO ANSWER / DIAL and COMMUNICATION menu. If the number is ENGAGED this may be seen as an answer and the screen will start to display corrupted characters, at this point the user should press the CTRL and TAB keys together to return to the "MODE SELECT" menu. If there is no ANSWER the "RE-DIAL" menu will be displayed.

R = RE-DIAL
N = NEW NUMBER
M = MENU

Entering R will re-dial the same number and follow the above sequence.

Entering N will take you to the number entry menu as above so a new number can be entered then continue as above. Entering M will take you back to the initial menu.

Option C from the AUTO ANSWER/DIAL COMMS menu should be selected if contact has already been made by dialling with the telephone. If a carrier is detected the modem will switch into COMMS mode. If a carrier is not received an automatic return to this menu will be made. A preset time is incorporated in the CARRIER DETECT routine, if a carrier is not received after approximately 1 minute, the routine times out and returns. Options C can also be selected if the interface is used to connect to another computer.

Entering U from the first menu will display.

***** BAUD RATE SELECT *****

1	=	300	-	300	FULL DUPLEX
2	=	1200	-	1200	FULL DUPLEX
3	=	1200	-	75	FULL DUPLEX
4	=	75	-	1200	FULL DUPLEX

CTRL & TAB to EXIT

Entering 1,2,3 or 4 will set the BAUD rates as above after which the DATA WORD menu is displayed.

***** DATA WORD SELECT MENU *****

Length Parity Stop

1	7	EVEN	2
2	7	ODD	2
3	7	EVEN	1
4	7	ODD	1
5	8	NONE	2
6	8	NONE	1
7	8	EVEN	1
8	8	ODD	1

*** SELECT MODE (1 TO 8) ***

CTRL & TAB to EXIT

Entering a number from 1 to 8 will set the DATA word as above and then go on to display the auto ANSWER/DIAL COMMS menu.

Once you are into the COMMS mode a whole host of commands become available by pressing a combination of CTRL/SHIFT and NUMERIC key, as will be shown in the following pages.

***** TEXT EDIT *****

Entering T from the first menu will take you into the TEXT EDIT mode, the screen will clear and a cursor will be displayed waiting for your entries. This part of the program has been provided to allow the user to prepare text while "OFF-LINE". It is NOT the intention that this should be used for large DOCUMENTS rather for a few lines of text as used in TELEX etc. The BUFFER used is preset on POWER UP to 3000 bytes. Please refer to page 15 for details of the BUFFER and how to preset the size required for individual requirements.

Using TEXT EDIT is very similar to using a wordprocessor, all the cursor movements and delete keys allow text to be positioned or deleted as required.

This should prove very useful to anybody who uses the modem for sending TELEX messages or messages to B.T GOLD etc. Any prepared text will be sent DOWN LINE exactly as it has been entered i.e. all cursor movements, deletions and corrections will be sent in the same order they were entered (The buffer stores these one after another).

TEXT EDIT can be used in any of the Amstrad screen modes.

Having selected option "T" from the MODE SELECT menu, to select the BUFFER options press SHIFT and NUMERIC key 4 together. The BUFFER should first be cleared option (C). Please refer to page 15. Then select (O)n to turn the BUFFER ON. Text can now be entered as required.

TEXT Screen example;

ATT: A.N.OTHER.

Date 10.08.86

OTHERS ENGINEERING.
LONDON.

Many thanks for your last message.
Have finally received the items.
Will call you next week.

Regards S.SMITH.

When all text has been entered it can be SAVED to TAPE/DISC if it should be required later or the user can go ON LINE and send it.

PLEASE NOTE.. If the BUFFER OPTION (P)rint is selected the printer copy will not be as displayed, especially if CURSOR and DELEte keys have been used. (ALL key codes are stored in the BUFFER).

CTRL and NUMERIC key 9 could be selected for a copy of the screen. Please refer to page 11.
Any text that has been SAVED from the BUFFER can be LOADED back at a later date, edited, and then SAVED again or sent DOWN LINE.

 * PHONE DIRECTORY *

Pressing D from the MAIN menu will take you to the PHONE DIRECTORY menu, at this display you are presented with the options.

1 = Entry 2 = Save 3 = Load 4 = Quit

Option 1.

Pressing 1 on the keyboard allows you to make a New entry or overwrite an old one, when selected you are asked to enter the entry LETTER, this is the letter in the left hand column. under the heading E (for ENTRY). An entry Letter from A to R can be entered, giving 18 entries per page.

When one of these Letters is pressed a cursor will appear at the first column (in the row selected by Letter entry) under the heading NAME, you can now type in your reference to that entry, persons name etc. this can be a mix of letters and numbers (lower case letters are converted to upper case). At all times when making an entry, if you make a mistake you can use the delete key to correct, having entered the name then press the space bar to step forward to the number section, note the cursor will jump the vertical bars.

Numbers only are accepted in this section and CAN have spaces inbetween numbers (i.e. Code then Number) if so desired.

Again pressing space bar to step into the column under T, this stands for Terminal Type and can be set to V for Viewdata (Prestel type) or S for Scrolling Screen (Bulletin board type) On pressing V or S the cursor now appear under the column headed B for Baud Rate, this is a number taken from below.

1 =	300	-	300
2 =	1200	-	1200
3 =	1200	-	75
4 =	75	-	1200

Once selected the cursor then appears under the heading W for Data Word, again select from below menu.

	Length	Parity	Stop
1 =	7	Even	2
2 =	7	Odd	2
3 =	7	Even	1
4 =	7	Odd	2
5 =	8	None	2
6 =	8	None	1
7 =	8	Even	1
8 =	8	Odd	1

Typical settings are:

Name:	T	B	W
PRESTEL	V	3	3
Bulletin Board	S	1	6

Once the Word number has been entered the entry is complete and the prompt will again appear for you to select an option, you can of course select option 1 again and make further entries.

Option 2.

Allows you to save the complete page of entries as is currently displayed, you will be asked whether to save to Disc or Tape and then requested to enter a File name to save it under. Also see AUTO page load.

Option 3,

Allows you to Load a page of Entries from Disc or Tape to the screen, again enter T or D then File name. You have therefore 18 entries per page and can have as many pages as you wish as long as you have space on your storage medium and use different file names for each.

Option 4.

This takes you back to the main menu

Auto Page Load.

An automatic fetcher for DISC DRIVE users only is written into the software, to make it easier to use and more efficient when the option D is selected from the main menu. The program will AUTOMATICALLY look for and load a Phone number page under the file name PHONE this being created earlier using option 1 and 2. If the file is not found then a new page will be displayed ready for entries or to Load a page under a different name.

The last option initiates the auto dial sequence, this is done once you have the directory displayed on the screen and the prompt "Enter Option or LETTER to dial" is displayed, Simply press the entry Letter (left hand column) on the keyboard, this then sets up the Data word, Baud rate and the Terminal type then dials the number and continues as in the Auto Dial sequence. The message "DIALLING NUMBER" is displayed.

Note. Full error checking on entries and when dialling is carried out and a message will be displayed when trying to dial a number where there is an error in the directory.

Eg: "There is an error in the Phone Directory".

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*****
*
*               QUICK REFERENCE GUIDE
*
*   WITH CTRL KEY AND NUMERIC / FUNCTION KEY PRESSED
*
*****
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Options.

Key No.

- | | | |
|-------------------|-----------------|--|
| 0. | STATUS. | Displays options MENU. |
| 1. | ECHO DISPLAY. | Data SENT is also displayed on the screen |
| 2. | ECHO SEND. | Data RECEIVED is sent back to be displayed on senders screen. |
| 3. | PRINTER. | Spool incoming data to printer. |
| 4. | SCREEN L/FEED. | LINE FEED control is sent to screen after CARRIAGE RETURN is received. |
| 5. | SEND LINE FEED. | The control code for line feed is SENT DOWNLINE after carriage return. |
| 6. | PRINTER L/FEED. | LINE FEED control code is sent to printer after CARRIAGE RETURN IS received. |
| 7. | DISPLAY CODES. | Determine what action is taken on control codes. |
| 8. | SCREEN RESET. | Resets screen to default settings. |
| 9. | PRINTER COPY. | ASCII characters printed on the screen are copied to the CENTRONICS port. |
| DOT. SCREEN MODE. | | Changes screen modes. |

Alternative states can be selected by pressing the desired key again.

THESE ARE AVAILABLE AT ALL TIMES WHEN IN COMMUNICATION MODE

With CTRL key and NUMERIC/FUNCTION key pressed.

Key No. options...

0. STATUS. This option is provided so the user can see at any time which KEY OPTIONS are in operation, (ON or OFF). A small square will be displayed beside the key number if its option is ON.
Press ANY key to return to COMMS mode.
1. ECHO DISPLAY. With this option selected any character that is typed in on the keyboard or sent downline using the BAR commands from basic, will be displayed on the users screen. This makes it possible to view any messages etc, as they are typed in or sent.
Selecting a second time switches the option OFF.
2. ECHO SEND. After selecting this option any character received downline will be displayed on the screen and then sent back to the sender for display on his/her screen. This will allow the sender to view what is being typed in if he/she does not have an option that performs as in ECHO DISPLAY.
Selecting a second time switches the option OFF.
3. PRINTER SPOOL. If hard copies of any received data are required by the user for viewing at a later date, selection of PRINTER SPOOL will direct incoming data to the computers CENTRONICS port.
The incoming data will still be displayed on screen while this option is selected.
Selecting a second time switches the option OFF.
4. SCREEN LINE FEED. On receipt of the code for carriage return, HEX 0D, (the code when the ENTER key is pressed, (DEC 13)), the code for LINE FEED will be sent to the screen. (Line feed code is HEX 0A, DEC 12).
Selecting a second time switches the option OFF.
5. SEND LINE FEED. If this option is selected, everytime the code for carriage return is detected (ENTER key), the code for line feed, (HEX 0A), will also be sent downline to the receiving computer. This option may be needed if the receiving terminal requires a line feed code when printing to the screen.
Selecting a second time switches the option OFF.
6. PRINTER LINE FEED. This option has been provided, as with the other line feed options, to send a line feed after the code for carriage return is detected.
With PRINTER LINE FEED the code will be sent to the CENTRONICS port, for the printer to act upon.
Selecting a second time switches the option OFF.

With CTRL key and NUMERIC/FUNCTION key pressed

Key No. options...

7. DISPLAY CODES. The MODEMS software has a CONTROL CODE DETECT routine which will only let specific CONTROL CODES to be passed to the screen print routine. This is to eliminate unwanted screen effects, IE. some control codes below 32 can change window sizes, pen or paper colours etc. Please refer to your computers manual for more details on the control codes from 0 to 32. This option is supplied so the user can select if just the cursor, clear screen and bell codes are acted upon, if ALL the codes are to be acted upon or if their graphic representation is to be displayed.

USING DISPLAY CODES OPTION

Selecting this option will generate a display on the screens bottom line... NORMAL ACTED UPON GRAPHIC.

Selecting the first letter of the required option will give the following results...

- (N)ormal. Only the codes passed by the CODE DETECT ROUTINE will be acted upon.
These codes are; (HEX) 07,08,09,0A,0B,0C and 10.
- (A)cted. Selecting this option will allow ALL the control codes listed in the users manual to be acted upon.
- (G)raphic. With this option selected the graphic symbol of these codes will be displayed but NONE of the codes will be acted upon.

PLEASE NOTE !!!... It is advised to select this option before selecting READ FILE or READ AND SEND, (Key options 2 or 3 with SHIFT pressed), especially if BINARY files are to be read, as these are likely to result in unusual and unwanted screen effects. These options can be changed as and when the user requires.

8. RESET SCREEN. This option has been supplied to reset the screen to its default settings, if any unwanted screen effects occur.
It can also be used to CLEAR SCREEN while in the COMMS mode. (Reset to 40 column).

9. PRINT SCREEN. When this option is selected a screen copy will be sent to the printer. This is NOT a full screen dump routine, only recognisable ASCII characters displayed on the screen will be printed.

DOT. SCREEN MODE. Every time this key is pressed the screen mode will change. In sequence (0-1-2-0-1-2)
Mode 0 = 20 col. Mode 1 = 40 col. Mode 2 = 80 col.

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*****
*
*               QUICK REFERENCE GUIDE
*
*   WITH SHIFT KEY AND NUMERIC / FUNCTION KEY PRESSED
*
*****

```

Options.

Key No.

- | | | |
|-----------|-----------------|--|
| 0. | CURSOR. | Allow or disallow cursor to be displayed. |
| 1. | SPOOL. | Incoming data is saved on DISC or TAPE. |
| 2. | READ FILE. | Load file from DISC or TAPE and displayed onto screen. |
| 3. | READ AND SEND. | Data read from DISC/TAPE is sent DOWNLINE. |
| 4. | BUFFER MENU. | Display BUFFER options. |
| 5. | DOWNLOAD FILES. | Load a file/program received downline and save directly to TAPE or DISC. XMODEM protocol used. |
| 6. | UPLOAD FILES. | Load a file/program from TAPE or DISC and send it DOWNLINE. XMODEM protocol used. |
| 7. | SEND SCREEN. | Send ALL ASCII characters printed on screen DOWN LINE. |
| 8. | SAVE SCREEN. | Save ASCII characters to DISC or TAPE. |
| 9. | X-ON/X-OFF. | Switches "X" control ON or OFF. |
| DOT. CAT. | | Catalogue TAPE or DISC while on line. |

Alternative states can be selected by pressing the desired key again.

THESE ARE AVAILABLE AT ALL TIMES WHEN IN COMMUNICATION MODE

With SHIFT key and NUMERIC/FUNCTION key pressed.

Key No. options...

0. CURSOR. This option is provided for personal preference of the user. If the cursor is displayed then it will be turned off, pressing a second time will turn the cursor display ON again. If the cursor is OFF when this option is selected it will turn it ON, a second selection will turn it OFF again.
1. SPOOL. Spooling refers to the SAVING of incoming data to a TAPE or DISC storage system and allows the user to keep files of received data, that he or she may find useful to view, or refer to at a later date. As data is received it is displayed on the screen and is put into the computers TAPE/DISC save buffer. When the buffer is full, (2048 characters), it is automatically saved to the chosen storage system. After the block of data has been saved the buffer is filled with incoming data again, this will continue until the user terminates the option.

HOW TO USE SPOOL.

After the user has selected the SPOOL option he/she will be asked if the data is to be saved to tape or disc.

A simple single key entry of T or D is required.

The file type to be spooled will be requested, the user will need to enter either A for ASCII, B for BASIC or C for CODE (binary).

If a binary file is to be SPOOLED the user will need to know the start address for loading the file at a later date.

Having made the choice and ensuring a cassette or disc has been inserted, a FILENAME must then be entered. A filename of upto 16 characters can be used for tape storage, filenames used when saving to disc should be a maximum of 8 characters. Any errors made when entering a filename can be corrected by using the DEL key. To end filename entry press ENTER key.

After entering the filename any further incoming data will be spooled.

STOP SPOOL.

Pressing the SHIFT and NO.1 keys again, will print an option on the bottom line of the screen. STOP SPOOL Y/N ?.

This is to ensure that the key has not been pressed by mistake. Pressing "N" will return to the COMMS mode and SPOOLING will continue.

Pressing "Y" will immediately CLOSE the file and any data in the computers TAPE/DISC buffer will be SAVED.

During the time taken for the TAPE/DISC buffer to be saved, the data still coming downline WILL be lost. The reason for this is, the INPUT routine is DISABLED (machine code DI), because of the critical timing of the TAPE/DISC save routine. (The INPUT routine is disabled whenever files are saved or loaded). To overcome this problem the XON/XOFF option should be selected IF the sending computer can act upon the commands.

Please refer to KEY No 9 section.. XON/XOFF.

With SHIFT key and NUMERIC/FUNCTION key pressed.

Key No. options...

2. READ FILE. This option is purely a viewing system. Any files or programs can be read from TAPE/DISC and displayed on the screen without loss of USER MEMORY. Files are not put into memory, they are just printed to the screen. This routine can be used to view any data SPOOLED to TAPE/DISC to ensure all data has been received. IE: wordprocessor files. SPOOL could then be selected again if any data losses are found.

HOW TO USE READ FILE.

As with the SPOOL option when READ FILE has been selected the user will need to choose between TAPE or DISC and enter the FILENAME to read. Errors on filename entries can be corrected by using the DEL key, and the filename entry by pressing the ENTER key. Reading the file will start as soon as the ENTER key has been pressed. At the end of the file it returns to COMMS mode.

Pressing the SPACE BAR will stop the listing.
Pressing the ENTER/RETURN key will restart the listing.
Pressing CTRL and TAB keys will terminate the option, closing the file and returning to COMMS mode.

3. READ AND SEND. This option is similar to READ FILE but the data that is displayed on screen will be SENT DOWN LINE. Therefore any files saved on TAPE/DISC can be transferred to another computer. IE: wordprocessor files can be prepared prior to going ON LINE and then sent to another computer.

HOW TO USE READ AND SEND.

Entering this option will request T or D ? and Filename to read.

Keyboard controls, SPACE BAR, ENTER and CTRL and TAB operate as in READ FILE.

If this option is used with the X-ON/X-OFF facility (see Key 9), and the receiving computer uses X-ON/X-OFF, then the reading of files will be controlled by the receiving computer.

IE: receiving X-OFF will have the effect of the user pressing the SPACE BAR.

Receiving X-ON will be the equivalent of the user pressing the ENTER KEY.

The user can still press CTRL AND TAB keys to terminate this option before the end of file.

REMEMBER !!! CTRL and Key 7 option G should be selected BEFORE READ FILE or READ AND SEND are used if a binary file is to be read or transferred, as screen corruption WILL occur.

With SHIFT key and NUMERIC/FUNCTION key pressed

Key No. options...

4. BUFFER MENU. The BUFFER size is preset to 3000 bytes but can be set to suit the users own requirements. See ¶SETBUFF page 22.
There are 2 main uses for the BUFFER these being:
a) It can be used to transfer pre-loaded data/text before, or, while on line.
b) Data received can be loaded into the BUFFER to view later, or, to be saved to TAPE/DISC.

HOW TO USE THE BUFFER.

A list of options is displayed on the bottom line of the screen when this key is pressed, they are..

(O)N. (E)ND. (T)RAN. (V)IEW. (C)LEAR. (L)OAD. (S)AVE. (P)RINT.

The first character in the displayed names should be entered to select the desired option.

- (O)n. This will OPEN the BUFFER and ALL incoming data will be stored.
Trying to open a FULL BUFFER will display BUFFER FULL otherwise BUFFER ON will be displayed.
You may OPEN and CLOSE the BUFFER as often as you like, new data will be TAGGED onto the end of existing data.
Should the BUFFER become FULL at anytime BUFFER FULL will be displayed and it will be CLOSED AUTOMATICALLY.
- (E)nd. Will CLOSE the buffer, preventing any further data being entered into it.
- (T)ran. Displays the BUFFER contents on the screen and sends it DOWNLINE. If CTRL and Key 6 has been SET "ON" then this will be Reset to "OFF" to avoid double printing on the receiving computer.
- (V)iew. Displays the contents of the BUFFER on the screen.
- (C)lear. Clears the BUFFER of any stored data.
- (L)oad. Loads a file from TAPE or DISC. The user will need to enter T or D followed by a filename pressing the ENTER key will end filename entry and LOADING of the file will start.
If the BUFFER size is larger than the file length to be LOADED then ALL the file will LOAD into the BUFFER.
A BUFFER size SMALLER than the file length will result in only data of the BUFFER size being LOADED. It is advisable to set the BUFFER size LARGER than is likely to be needed. See ¶SETBUFF page 22.
- (S)ave. Saves the contents of the BUFFER in ASCII format to TAPE or DISC.
- (P)rint. Any printable data in the buffer will be read and sent to the CENTRONICS port to produce a hard copy.

When the LOAD and SAVE options are chosen the user will be required to enter T or D and a Filename.

After selecting one of the above options the COMMS mode is returned to.

With SHIFT key and NUMERIC/FUNCTION key pressed

Key No. options...

5. DOWNLOAD FILES. This option performs file transfers on the XMODEM protocol basis.
Data that is received downline is saved to TAPE or DISC in blocks of 128 bytes in length.
Each block has a block number and a checksum, the checksum is to ensure that all the bytes in the block are received correctly.
If the receiving computers checksum is the same as that received, then an automatic request is made to send the next block.
Should for some reason the checksums be different then an automatic request is made to send the block again.
Upto 10 requests for a block to be re-sent can be made, if on the tenth attempt the checksums are not the same then the option will ABORT and return to the COMMS mode.

HOW TO USE DOWNLOAD. (XMODEM)

The user will first be asked to enter if the file is to be saved to TAPE or DISC.
The type of file to be received will then need to be entered, options of either A for ASCII, B for BASIC or C for CODE (binary) will be displayed. With binary files the user will need to know the start address for loading the file at a later date.
After the file type has been entered a filename will be requested, pressing the ENTER key will open the file to the selected storage medium and the DOWNLOAD will start.
During the download the screen will display *** DOWNLOADING *** and the number of the block being received will be displayed. If ALL the blocks are received correctly, ie ALL checksums for each block were correct the file will automatically close, returning to the COMMS mode. Block numbers will be displayed in HEX, ie 0A. If the routine ABORTS, then the message *** ABORTED *** will be displayed.

6. UPLOAD FILES. This option also performs file transfers on the XMODEM basis. The user will be sending data which will be read from TAPE or DISC and sending it to another computer.
The users computer will send the block number, 128 bytes of data followed by the checksum. On receipt of the appropriate code from the receiving computer the next block will be sent or the last block sent will be re-sent.
An automatic TIMEOUT of 1 minute is included in this routine, if there are no codes received, to send or re-send a block, the routine will ABORT and return to the COMMS mode.

HOW TO USE UPLOAD. (XMODEM)

The user will need to enter TAPE or DISC and the name of the file to send. Pressing the ENTER key after the filename is complete will open the file and the UPLOAD will start.
If the transfer is completed or TIMEOUT occurs then a return to COMMS mode will be made.

with SHIFT key and NUMERIC/FUNCTION key pressed

Key No. options...

8. SEND SCREEN. Any ASCII characters displayed on the screen will sent DOWN LINE.
This will operate in ALL screen modes.
7. SAVE SCREEN. Any ASCII characters displayed on the screen will be SAVED onto TAPE or DISC. This will operate in ALL screen modes.
The usual requests to enter T or D and Filename will be made.
9. X-ON/X-OFF. When files are transferred from one computer to another and SPOOLED to TAPE or DISC, it is possible that the data which is still being received, while data is being saved to tape or disc, could be missed and not saved. Because of the time taken by the computers SAVE routine. To eliminate this problem the X-ON/X-OFF option is provided. X-ON/X-OFF should only be selected if the SENDING or RECEIVING computer can act upon the codes used.

When the computers SAVE buffer is FULL, a code will automatically be sent to the sending computer this will have the effect of saying, "Stop sending until I've saved the data you've just supplied me with". When the SAVE buffer is empty and all the data is saved, another code will automatically be sent.

This will have the effect of saying "OK, you can now send me more data". The operation will continue until all the required data has been saved to TAPE or DISC. This option can be used if the user is sending or receiving files.

On receipt of the X-OFF code a message will be displayed....

*** X-OFF RECEIVED ***

Pressing key 9 a second time will turn the option OFF.

It is possible to send the control codes manually by keyboard entries. CTRL and S sends code for X-OFF
CTRL and Q sends code for X-ON

DOT. CATALOGUE. This performs the same function as the CAT command in Amstrad basic, a CATALOGUE of the TAPE/DISC currently in use is displayed.
This routine will immediately return to the COMMS mode.

```

*****
*
*          KEYPAD CONTROLS REFERENCE GUIDE          *
*
*      With SHIFT, CTRL and NUMERIC/FUNCTION key pressed
*
*****

```

Options.

Key No.

0. SELBAUD. This option will allow the BAUD rate setting to be changed at anytime.

***** BAUD RATE SELECT *****

1 =	300 - 300	FULL DUPLEX
2 =	1200 - 1200	FULL DUPLEX
3 =	1200 - 75	FULL DUPLEX
4 =	75 - 1200	FULL DUPLEX

Entering 1,2,3 or 4 will set the BAUD rates as above after which it returns to the COMMS mode.

1. SELWORD. This option will allow the DATAWORD to be changed at anytime.

***** DATA WORD SELECT MENU *****

Length Parity Stop

1	7	EVEN	2
2	7	ODD	2
3	7	EVEN	1
4	7	ODD	1
5	8	NONE	2
6	8	NONE	1
7	8	EVEN	1
8	8	ODD	1

*** SELECT MODE (1 TO 8) ***

Entering a number from 1 to 8 will set the DATA word as above and then returns to the COMMS mode.

2. DISC LOCK By selecting DISC LOCK, when any of the other key options are selected that save or load data to TAPE/DISC this then automatically selects DISC and the usual T or D is NOT displayed. To turn off, select again.

9. *** The user is advised NOT to press this key ***

```

*****
*
*          BAR COMMANDS AVAILABLE TO THE USER.
*
*****

```

BAR COMMAND refers to the character generated when the user presses the SHIFT and @ keys simultaneously. i.e. ¶MODEM. Any variables or characters specified in the following explanations are for demonstration purposes only. Most of these commands are for use with a AUTO-DIAL AUTO-ANSWER modem, but can of course be used with any device connected to the interface. (Printer, Computer, Typesetter, ect.)

¶MODEM Enters directly into the rom MASTER MENU, all selections will then be carried out with menu prompts.

¶BAUD The variable following this command will set the baud rate. Values from 1 upto 4 inclusive will set the baud.

***** BAUD RATE OPTIONS *****

```

¶BAUD,1  = 300  Receive 300  Transmit
¶BAUD,2  = 1200 Receive 1200 Transmit
¶BAUD,3  = 1200 Receive 75   Transmit
¶BAUD,4  = 75   Receive 1200 Transmit

```

¶WORD This command operates in a similar way to ¶BAUD, but this sets the DATA WORD. The variables used are 1 to 8 inclusive.

**** DATA WORD OPTIONS ****

	LENGTH	PARITY	STOP
¶WORD,1 =	7	EVEN	2
¶WORD,2 =	7	ODD	2
¶WORD,3 =	7	EVEN	1
¶WORD,4 =	7	ODD	1
¶WORD,5 =	8	NONE	2
¶WORD,6 =	8	NONE	1
¶WORD,7 =	8	EVEN	1
¶WORD,8 =	8	ODD	1

 * BAR COMMANDS AVAILABLE TO THE USER. *

%DIAL A string containing the number to be dialled must be used with this command. The variables are read from within the string and are used to pulse the line. (RTS line)
 The string name to be used can be upper or lower case and can contain any number of digits upto and including 16.

Eg: 10 Z\$="1234567890"
 20 %DIAL,@Z\$

%COM This is a direct call into the screen to screen mode. This routine can be entered immediately after the baud rate and dataword have been preset.

Eg: 30 %COM : REM 2 way communication (COMMS)

%ANSWER Will set the interface into the AUTO ANSWER mode. It will wait for a incoming call. When ringing is detecting on the line (CTS in) upto 4 rings, it ANSWERS the call by sending a high output to RTS line which tells your modem to answer the phone, hold the line and turn on your modems carrier output signal. On receipt of this the calling modem would be expected to send a carrier back. The callers carrier should be detected by your modem and send a high level on the CTS line

%WAITCAR. Is used to detect if a CARRIER is being received by your modem (CTS input). The returned value of a variable determines if a carrier has been detected, prior to using this command the variable needs to be defined.

Eg: 100 A%=0
 110 %WAITCAR,@A% : REM % MUST be entered.

If a returned value of A%=255 then a carrier has been detected.

If A%=0 a carrier has NOT been detected.

If a carrier is not received after approximately 1 minute, it times out and returns to basic. (A% will then = 0).

%CARDIR. This command is also used to detect if a carrier is being received, but unlike %WAITCAR this routine does not have a preset timeout. The value of the predefined variable (A%), is returned immediately. If the user has set the modem up to operate as a BULLETIN BOARD, this routine can be used at anytime to determine if the caller has gone OFF LINE. If it was found there was not a carrier the bulletin board would immediately go back to the AUTO ANSWER mode.

```
*****
*          BAR COMMANDS AVAILABLE TO THE USER.          *
*****
```

¶OFF This command will switch OFF the input routine
 ¶RESET must be used again if bar commands are
 to be used again

¶PRINTSCR Will perform a screen copy in any mode. This
 is not a screen dump routine, only ASCII
 characters will be copied.
 DO NOT USE THIS WITHOUT A PRINTER CONNECTED.

¶SERIAL Any listings that are normally sent to the
 CENTRONICS port using the PRINT #8 command are
 redirected to the INTERFACE.

¶CPRINT Resets the ¶SERIAL command, returning all
 PRINT #8 commands to the CENTRONICS port.

```
Eg: 100 ¶SERIAL
     110 PRINT #8,"SERIAL printer"
     120 ¶CENTRONIC
     130 PRINT #8,"CENTRONICS PRINTER"
```

¶GET This will get a byte of DATA from the data
 store. The variable used to return the byte
 must be defined before the ¶GET command is
 used.

```
Eg: 100 B%=0: REM The % MUST be used.
     110 ¶GET,@B%
```

A returned value greater (>) than 255 means
 the character buffer is empty. If the
 interface is to be used with a modem as a
 bulletin board this option can be used to
 detect the response to a menu.

¶PUT This will send a single byte of data to the
 interface.

```
Eg: 100 FOR A= 32 TO 255
     110 ¶PUT,A
     120 NEXT A
```

¶RTS Using this command the user can set the RTS
 output to a high or low.

```
Eg: 50 ¶RTS,0 : REM output LOW
     60 ¶RTS,1 : REM output HIGH
```

¶CTS This command allows the user to read in the
 input CTS on the interface. The variable
 needs to be defined prior to use.

```
Eg: 40 A%=0
     50 ¶CTS,@A%
```

If A%=0 then CTS input is LOW
 If A%=1 then CTS input is HIGH

 * BAR COMMANDS AVAILABLE TO THE USER. *

¶SEND Will allow the user to send a predetermined block of code. After the command has been entered the entire block of code will be sent downline. Eg: ¶SEND,start,length. Start refers to the codes start address and length refers to the length of the block in bytes.

Eg: 100 ¶SEND,28000,3000

¶RECEIVE This can be used to receive a predetermined block of code downline. When the command has been entered the computer will wait to receive the block. Variables for the location to put the block and length to receive need to be entered, as in ¶SEND.

Eg: 100 ¶RECEIVE 35000,2000

The user should not receive data to any address above HIMEM as this will corrupt systems variables. If the user is unsure of the length of code to receive, it is advised to enter an amount that is likely to be too long. Then when data is no longer being received, the user can terminate the option by pressing the CTRL and TAB keys.

¶SENDSCR The operation of this command is the same as ¶PRINTSCR, with the exception that the ASCII characters displayed on the screen are directed to the INTERFACE and transmitted downline.

¶PRINTER If the user desires to keep a record of any data received while on line this command will direct data to the CENTRONICS port. Data will still be displayed on screen. The value following the command determines if ON or OFF.

Eg: 100 ¶PRINTER,1 : REM Data to printer.
 110 ¶PRINTER,0 : REM Printing OFF.

¶PRINTERLF A command which can be used in conjunction with ¶PRINTER. If the users printer requires the code to be sent to perform a line feed, this command will send the code HEX 0A, whenever code HEX 0D, (carriage return) is received. The value following the command determines if ON or OFF.

Eg: 100 ¶PRINTERLF,1 : REM Line feed ON
 110 ¶PRINTERLF,0 : REM Line feed OFF

¶SCREENLF The function of ¶SCREENLF is the same as ¶PRINTERLF ON or OFF is controlled in the same way. The only difference being, the code for line feed is sent to the screen print routine.

Eg. 100 ¶SCREENLF,1: REM Screen line feed ON
 110 ¶SCREENLF,0: REM Screen line feed OFF

 * BAR COMMANDS AVAILABLE TO THE USER. *

¶SENDLF Operates as ¶SCREENLF and ¶PRINTERLF, the only difference is that code 0A is sent down line, as well as code 0D whereby the receiving computer will act upon the codes, ie screen line feed.

Eg: 100 ¶SENDLF,1: REM Send line feed ON
 110 ¶SENDLF,0: REM line feed OFF

¶SENDECHO The pupose of this option is to return to the sender any character that has been received and printed on the screen. This will allow the sender to view what he/she has sent, ensuring correct messages have been sent, to you.

Eg: 100 ¶SENDECHO,1 : REM Return received data
 110 ¶SENDECHO,0 : REM Turn echo OFF

¶SCRECHO This operates in the same way as ¶SENDECHO. The only difference being, the user will have the characters printed on his/her screen as they are typed on the keyboard. The user can then be sure the correct characters have been typed in.

Eg: 100 ¶SCRECHO,1: REM Print sent data
 110 ¶SCRECHO,0: REM Turn screen echo OFF
 If ¶SCRECHO is ON and the redirect #8 command ¶SERIAL is ON, the PRINT #8 messages will be displayed on screen as the listing is sent down line.

¶XON This command is used to set the X-ON/X-OFF option for use with the ¶SPOOL command etc. The user is advised to refer to the section on page 15, SHIFT and NUMERIC key No 9 for an explanation of X-ON/XOFF.

Eg: 100 ¶XCONTROL,1: REM X-ON/X-OFF turned ON
 110 ¶XCONTROL,0: REM X-ON/X-OFF turned OFF

¶SPOOL. An explanation of SPOOL can be found in the section SHIFT and NUMERIC key No 1, (Page 11.) A filename and file type MUST be entered. The filetype must be entered in a numeric form so the TAPE/DISC save routine knows the filetype to SPOOL. Numeric values are..

BASIC - 0 (¶SPOOL,@Filename,0)
 BINARY - 2 (¶SPOOL,@Filename,2)
 ASCII - 22 (¶SPOOL,@Filename,22)

This needs to be used in conjunction with the ¶GET command.

Eg: 90 Z\$="TEST"
 100 ¶SPOOL,@Z\$,22
 110 A%=0
 120 FOR B=1 to 1000: REM SPOOL 1000 bytes
 130 ¶GET,A%:IF A%>255 THEN GOTO 130
 140 PRINT CHR\$(A%): REM Print character
 160 NEXT B

An automatic exit from ¶SPOOL can be set by a simple check routine.

Eg: 150 IF CHR\$(A%)="E" GOTO 170

 * BAR COMMANDS AVAILABLE TO THE USER. *

¶ESPOOL This is used to close the file which had been opened with the ¶SPOOL command. Any remaining data in the computers SAVE BUFFER will be saved to TAPE/DISC. With reference to the example listing in the ¶SPOOL command if B=1000 in line 160 or the character "E" is detected in line 150 the ¶ESPOOL command would be entered in Line 170.

Eg: 150 IF CHR\$(A\$)="E" GOTO 170
 160 NEXT B
 170 ¶ESPOOL: REM Stop spooling data

¶SAVESCR As with the commands ¶PRINTSCR and ¶SENDSER this command reads ASCII characters printed on the screen, but SAVES them to TAPE/DISC. When all the characters have been read from the screen the file will close. A filename for the screen to be saved under will need to be entered.

Eg: 100 Z\$="SCREEN1"
 110 ¶SAVESCR,@Z\$

¶RFILE It has been made possible with the use of this command for the user to READ and VIEW a file from TAPE/DISC. The user is advised to select the ¶GRAPHIC command prior to ¶RFILE if a binary file is to be read, as unwanted screen effects WILL occur. The filename to be read needs to be entered with this command.

Eg: 100 Z\$="TEST"
 110 ¶RFILE,@Z\$

¶SWREAD The same as ¶RFILE. But data is sent down line. It should be followed by a value, 0 or 1. If set to 1 then it inhibits display to screen.

I.E 100 ¶SWREAD,@Z\$,1

The user is advised to refer to page 12 for a more detailed description of the operation of ¶RFILE and ¶SWREAD.

¶CURKEY Will allow the user to predefine the CURSOR codes that will be sent down line when in the COMMS mode. The default settings are:

DELeTe keyDEC 08,16
 Cursor key LEFT...DEC 08
 RIGHT...DEC 09
 UP.....DEC 11
 DOWN...DEC 10

Entries MUST always be made in this order. For the user to set the keys to the default settings he/she would need to enter..

10 ¶SETKEY,08,16,08,09,11,10

By referring to the computers manual and the section relating to CONTROL CODES, it can be seen what effect a receiving terminal will experience.

cont.

 * BAR COMMANDS AVAILABLE TO THE USER. *

¶CURKEY continued..

The receiving terminals cursor movements would be identical to the movements the user experiences while entering listings etc. from basic.

If the user were to use this command in conjunction with ¶SCRECHO, while still in the default mode, it would be possible to edit text that has already been sent down line and is displayed on the receivers screen. Editing would also be seen to take place on the users screen.

¶NORMAL Please refer to page 9 and the section

¶ACTED **** DISPLAY CODES ****

¶GRAPHIC for details on the action of these commands.

¶RESET When controlling the interface using the bar commands the user MUST enter this command BEFORE any other command is used. It performs a full initialisation of the system. This command is NOT needed before ¶MODEM.

¶STATUS Will display on screen which control options are set, (ON). The character "*" denotes ON. ¶PRINTSCR can be used for a hard copy.

¶MENU Simply displays a complete list of all the bar commands available. The brackets denotes a Variable should follow. If the user were to enter this command and then enter ¶PRINTSCR a quick reference listing could be obtained.

¶PRESTEL This is a direct call into the PRESTEL software section of the rom. Please refer to the section on *** PRESTEL ***

¶SETBUFF The BUFFER can be used to store..
 a) Received data
 b) Data loaded from TAPE/DISC
 c) Prepared text using TEXT EDIT
 The BUFFERS default size is preset on initialisation to 3000 bytes, within the area of the interfaces operating system. Using the ¶SETBUFF the user can change the size and location to suit individual requirements. ie ¶SETBUFF,Location,Length.
 Eg: 100 ¶SETBUF,30000,4000:REM Buffer set to start at 30000 and be 4000 bytes in length.

```
*****
*          BAR COMMANDS AVAILABLE TO THE USER.          *
*****
```

Please refer to page 10 and the sections on
BUFFER OPTIONS

```
%OBUFf      Eg: 100 %OBUFf: REM Buffer ON
%EBUFf      Eg: 100 %EBUFf: REM Buffer OFF
%TBUFf      Eg: 100 %TBUFf: REM Transfer buffer contents
              downline
%PBUFf      Eg: 100 %PBUFf: REM Print out buffer contents
%VBUFf      Eg: 100 %VBUFf: REM View contents of buffer
%LBUFf      A filename needs to be entered with this
              option, and should be entered into a STRING.
              Eg: 100 N$="BUFF1"
                  110 %LBUFf,@N$:REM Load buffer from DISC
                      or TAPE with file N$
%SBUFf      As with %LBUFf a filename needs to be entered.
              Eg: 100 N$="BUFF2"
                  110 %SBUFf,@N$: REM Save buffer contents
                      under filename N$
%CBUFf      This will CLEAR the entire contents of the
              buffer. And should all ways be used prior to
              using the buffer.
              Eg: 100 %CBUFf: REM Clear contents of buffer
%DOWNLOAD   This will allow the user to SAVE files that
              are received downline. ( XMODEM protocol )
              Please refer to page 14 and the section
              DOWNLOAD FILES.
              A filename and filetype must be entered when
              this command is used.
              Filetypes should be entered in numeric form as
              in the command %SPOOL.
```

Numeric Values are..

```
BASIC - 0 ( %DOWNLOAD,@Filename,0 )
BINARY - 2 ( %DOWNLOAD,@Filename,2 )
ASCII - 22 ( %DOWNLOAD,@Filename,22 )
```

```
Eg, 100 N$="PROGRAM1"
110 %DOWNLOAD,@N$,0: REM Download and save
                    basic program
```

 * BAR COMMANDS AVAILABLE TO THE USER. *

¶UPLOAD Will allow the user to LOAD a file from TAPE/DISC and send it downline. (XMODEM protocol). Please refer to page 14 and the section UPLOAD FILES. Only the filename to load is needed with this command.

Eg: 100 N\$="SENDPROG"
 110 ¶UPLOAD,@N\$: REM Load and send file N\$

¶DISPLAY This can be used to print out as in ¶COM, ie.. it allows the use of ¶NORMAL, ¶ACTED or ¶GRAPHIC facilities, also ¶SCREENLF. By this means it allows the user print ALL the 255 graphics to the screen. Please refer to the relative sections on DISPLAY CODES for details of their functions.

Eg: 100 A%=0
 110 ¶GET,@A%
 120 IF A%>255 goto 120
 130 ¶DISPLAY,A%: REM Print graphic or character

If the user were to use PRINT CHR\$(A%) at line 130, any values below 32 would be acted upon and the graphic representation would not be displayed.

Try this routine..

```
10 ¶GRAPHIC
20 FOR A=0 TO 255
30 ¶DISPLAY,A
40 NEXT A
```

When this routine has been RUN, change line 10 to ¶NORMAL or ¶ACTED and RUN it again. Notice the difference ?.

Press CTRL and TAB to ABORT a routine ie, ¶SENDSCR etc.
 Press SHIFT and TAB to EXIT a routine ie. ¶COM

This applies when running a basic program or from ¶MODEM.

It is left to the users personal requirements as to the way the BAR COMMANDS are used. Some short routines and a QUESTIONS and ANSWERS section can be found near the back of the manual to give assistance.

```
*****
***** PRESTEL *****
*****
```

To make page selections easier the NUMERIC KEYPAD has been defined to send the character code "#" when the small ENTER key is pressed and the character code for "." when the DOT key is pressed.

The Keypad will also allow other features when the CTRL and the relevant key number is pressed. Details of these are explained later.

VIEW Access to the PRESTEL can be from the MODEM option, or from basic programs. Where dial\$ = number to dial and id\$ = your ID and PASSWORD together. You can use an ID of 4444444444 (i.e.10 x4) and 4444 for your PASSWORD, to look at PRESTEL if you have not yet joined.

```
Eg: 100 dial$="0123456789":a%=0:id$="44444444444444"
     110 RESET:BAUD,3:WORD,3 78
     120 DIAL,@dial$
     130 WAITCAR,@a%:if a%=0 goto 130
     140 ID,@id$
     150 PRESTEL
```

A return to basic is made by pressing the CTRL and TAB keys together. If you leave PRESTEL with CTRL/TAB the line will still be held, enter PRESTEL to return into prestel or OFF to drop line etc.

To enter a page number use the key pad, enter * (dot) then the number ending with # (enter)

VIEW An additional BAR COMMAND is included, and this allows the user to enter the PRESTEL routine without going on line. It is included to allow VIEWING of SAVED PRESTEL pages that have been saved to tape/disc using the SAVE PAGE option. As a direct command enter VIEW, the screen will clear and the keypad options 5 and 6 become available. Saved pages can then be LOADED for viewing and ASCII copies can be produced if required.

If VIEW is followed by a file name it is directly displayed on the screen, this allows a carousel routine to be written.

```
Eg: 10 RESTORE 40
     20 FOR A=1 TO 5:READ Z$:VIEW,@Z$:NEXT
     30 GOTO 10
     40 DATA PAGE1,PAGE2,PAGE3,PAGE4,PAGE5
```

When using PRESTEL the function keys can be set to send ID's and Passwords, using SHIFT and the appropriate key.

```
I.E. 10 KEY 158,"0123456789"
     20 KEY DEF,11,1,56,158,56
     30 KEY 159,"1234"
     40 KEY DEF,3,1,57,159,57
```

This set SHIFT/8 to send 0123456789 and SHIFT/9 to send 1234

 * PRESTEL *

* OPTIONS AVAILABLE WHEN CTRL and NUMERIC/FUNCTION KEY PRESSED *

Key No....

- | | | |
|-----------|---------------|---|
| 1. | BUFFER MENU. | Display BUFFER options |
| 2. | SEND FILE. | Data is read from TAPE/DISC and transferred DOWN-LINE. |
| 3. | TELE-SOFTWARE | Programs available via AMSNET can be DOWNLOADED. |
| 4. | SAVE PAGE. | SAVE the currently displayed PRESTEL page to TAPE/DISC. |
| 5. | LOAD PAGE. | Any pages saved via SAVE PAGE are LOADED into the computer to be viewed. |
| 6. | PRINTER COPY. | ASCII characters printed on the screen are copied to the CENTRONICS PORT. |
| 8. | PAGE REFRESH. | The page currently in memory is RE-DISPLAYED. |
| 9. | REVEAL. | Concealed text is displayed. |
| 0. | CURSOR. | Allow or disallow cursor to be displayed. |
| DOT. CAT. | | Catalogue TAPE or DISC while on line. |
| COPY KEY. | | Copies text from Prestel page into the buffer. |

IMPORTANT. ALL options can be TERMINATED by pressing CONTROL (CTRL) and TAB keys at the same time.

To LEAVE the Prestel emulator press SHIFT and TAB.
 If you have entered Prestel from the main menu (MODEM) etc. This will take you back to the main menu and drop the line.
 If you have entered from the BAR commands (PRESTEL) then you return back to BASIC still holding the line you can do various things in BASIC (Eg. Set up Buffer) and then enter PRESTEL and return to Prestel from where you left off.
 You could also enter COM this would allow you to use all the fuctions from the keypads in COMMS mode but, of course, this is a Scrolling screen display.

*** PRESTEL KEYPAD OPTIONS ***

Key No. options...

1. BUFFER MENU. If the user intends to use the BUFFER option from within PRESTEL mode it should first be set using the basic Bar command `¶SETBUFF`, prior to entering `¶PRESTEL`. This is because the standard BUFFER uses the area used for PRESTEL page store. See `¶SETBUFF`. It is suggested that the example given here is used to set the buffer. Where `SIZE=BUFFER SIZE`

```
100 SIZE=1000
110 MEMORY HIMEM-SIZE-1
120 ¶SETBUFF,HIMEM+1,SIZE
```

PLEASE NOTE.. Incoming data cannot be loaded into the BUFFER when on line in the PRESTEL mode.

When this key is pressed the screen will be cleared and a list of options is then displayed on the bottom line of the screen.

The first character in the displayed names should be entered to select the desired option. When a selection has been made the last PRESTEL page will then be displayed again.

(O)n. These options to be used when in conjunction with
(E)nd. the COPY screen to Buffer.

(T)ran. Displays the BUFFER contents on the screen and sends it DOWNLINE.

(V)iew. Displays the contents of the BUFFER on the screen.

(C)lear. Clears the BUFFER of any stored data.

(L)oad. Loads a file from TAPE or DISC. The user will need to enter T or D followed by a filename pressing the ENTER key will end filename entry and LOADING of file will start.

If the BUFFER size is larger than the file length to be LOADED then ALL the file will LOAD into the BUFFER.

A BUFFER size SMALLER than the file length will result in only data of the BUFFER size being LOADED. It is advisable to set the BUFFER size LARGER than is likely to be needed.

(S)ave. Saves the contents of the BUFFER in ASCII format to TAPE or DISC.

(P)rint. Any printable data in the buffer will be read and sent to the CENTRONICS port to produce a hard copy.

When the LOAD and SAVE options are chosen the user will be required to enter T or D and a Filename.

After selecting one of options a return is made and the last PRESTEL page is re-displayed, this will include the message sent. For the message to be accepted by PRESTEL the user will then need to press the SMALL ENTER key,

PLEASE NOTE. It is advised to position the text within the TEXT EDIT mode using the CURSOR KEYS and to avoid pressing ENTER as the code for CR may cause adverse effects. [ONLY WITHIN PRESTEL]

2. READ AND SEND. Any wordprocessor files or BUFFER files can be prepared prior to going ON LINE and then sent to a mailbox etc, from tape or disc.

HOW TO USE SEND FILE.

Entering this option will clear the screen and request you to enter T or D then the Filename to read, after the entries have been made the last PRESTEL page will be displayed again when data transfer is completed. The data sent will also be displayed on screen. PLEASE NOTE. The user will need to press the SMALL ENTER key, (ENTER key on 6128), for the message to be accepted.

Pressing the SPACE BAR will stop the transfer.
Pressing the ENTER/RETURN key will restart the transfer.
Pressing CTRL and TAB keys will terminate the option, and close the file.

```
*****  
*                               PRESTEL / VIEWFAX DOWNLOADER                               *  
*****
```

3. Before starting any downloading, it is advisable to check that there is room on your disc. This can be done by pressing CTRL and the DOT on the key pad together, the screen will clear and a disc catalogue will be displayed, press any key to return. If using TAPE storage then insert a new tape and press the REC and PLAY buttons down, make sure the PAUSE key is NOT down.

By selecting the options as directed by PRESTEL/VIEWFAX ect. you will arrive at a menu of programs available for downloading.

Press the key for the chosen program. This new frame will display information about the program, follow instructions as directed by the display, at arriving at the HEADER frame you will be asked to press CTRL and key pad THREE key together.

The screen will clear and you will be given the option to save the program to Disc or Tape (unless the DISC lock is on, or you do not have a disc drive) Once selected a window will then be displayed showing you the name of the program downloading and the frame ID letter. This letter will change as each new frame is received, if there is an error received the frame is automatically asked for again, a message may be displayed informing you of an error.

The DISC or TAPE will start automatically as needed. There can be more than one part to the program (I.E. BASIC + CODE etc). At the end of downloading a program, the screen clears and the last frame will be displayed, this frame may or may not give instructions for you to follow, if not, key a page number in the normal way.

If at any time you wish to ABORT the DOWNLOADER then press the CTRL and TAB keys TOGETHER this will take you to page VIEWFAX 258.

4. SAVE PAGE. When this option has been selected the page currently displayed will be SAVED to TAPE/DISC.

HOW TO USE SAVE PAGE.

When key 4 is pressed the screen will clear and the message... "SAVE LAST PRESTEL PAGE..." will be displayed. Pressing the CTRL and TAB keys will abandon the option. On selecting "T" or "D" the user will then be required to enter a filename. Terminate the filename entry by pressing ENTER and the page details in the PRESTEL screen BUFFER will be saved to Tape/Disc.

When the page has been SAVED it will be displayed again and the user can continue selection of other pages.

5. LOAD PAGE. Any page that has been saved using the SAVE PAGE option can be loaded back into the computer and viewed again.

HOW TO USE LOAD PAGE.

The screen will clear and the message "LOAD PRESTEL PAGE." will be displayed and a selection of disc or tape will need to be made.

Next, the filename to LOAD must be entered and the ENTER key will terminate the entry and the page will be loaded into the PRESTEL BUFFER.

When loading is complete the page will be displayed and the user can load other pages if required or select new pages on PRESTEL.

6. PRINT SCREEN. When this option is selected a screen copy will be sent to the printer. This is NOT a full screen dump routine, only recognizable ASCII characters displayed on the screen will be printed.

8. PAGE REFRESH. This option has no specific function other than to allow the user to manually redisplay the page currently held in the PRESTEL BUFFER.

9. REVEAL. Some of the pages on PRESTEL contain CONCEALED text. To allow it to be displayed this option should be selected.

0. CURSOR. This option is provided for personal preference of the user. If the cursor is displayed then it will be turned off, pressing a second time will turn the cursor display ON again. If the cursor is OFF when option is select it will turn it ON, a second selection will turn it OFF again.

DOT. CAT. Catalogue TAPE or DISC while on line.

PRESTEL COPY KEY

Before using the Copy key in Prestel the buffer needs to be set up. as can be seen from the `¶SETBUFF` command the buffer can be set to any size, if you intend to capture quite a few pages of text from Prestel then you will need a large buffer size, the program below will help you to find out the space available

```
10 CLS:FINISH=HIMEM-1
20 START=FINISH-FRE(0)
30 SIZE=FINISH-START
40 PRINT "START  =";START
50 PRINT "FINISH =";FINISH
60 PRINT "SIZE   =";SIZE
```

This can be used to give you the maximum size Buffer. It is best to lower MEMORY before you set Buffer in this way and leave a margin between START and your Buffer. This may be needed if you save or load from Basic. Leave say 5000 bytes.

```
70 MEMORY START+4500
80 ¶SETBUFF,START+5000,SIZE-5000
```

Once the Buffer has been set up you can enter Prestel mode from the `¶MODEM` option or with your own BASIC program.

When in Prestel mode you need to open the Buffer with option CTRL and key NO.1 press "O" to switch the Buffer on you can also clear the buffer with "C" then as you receive pages from Prestel if you decide you would like to capture it simply press the COPY key and go on to select further pages. Each page takes up 1008 bytes of memory so depending on the size of buffer set you could possibly capture upto 30 pages before the Buffer becomes full, when the buffer is full a warning is given. The buffer captures data in ASCII format only and ADDS a carriage return and line feed after each line, this is so when printed out or if a Prestel Buffer file is loaded into a word processor program a correct display is given, the options of the Buffer Menu are all available as below.

(O)n. (E)nd. (T)ran. (V)iew. (C)lear. (L)oad. (S)ave. (P)rint

When viewing a Buffer file created by the use of the COPY key in PRESTEL the CR and LF are stripped off to give the normal 40 column display.

 * QUESTIONS AND ANSWERS *

Q.. HOW DO I SET THE BAUD RATE.

A.. From within the MENU driven options a selection is made from menus, this could be "P","B","E", on the main menu or from the USER DEFINE menu, or by pressing CTRL and SHIFT together then the 0 key on the keypad.

From Basic enter `¶BAUD,numeric expression ( 1 to 4 )`

Eg: `10 ¶BAUD,1`

Q.. HOW DO I SET THE DATA WORD.

A.. From within the MENU driven options a selection is made from the data word menu.

From Basic enter `¶WORD,numeric expression ( 1 to 8 )`

Eg: `20 ¶WORD,6`

Q.. HOW DO I ENTER THE NUMBER TO DIAL.

A.. The number to dial is entered directly when in the `¶MODEM` routine, in Basic it is necessary to enter the number into a string.

Eg: `30 dial$="123456789"`

`40 ¶DIAL,@dial$`

Q.. HOW DO I DETECT AN ANSWER.

A.. From within the MENU driven options this is done automatically. In Basic, use the `¶WAITCAR` command.

Eg: `50 A%=0`

`60 ¶WAITCAR,@A%`

`70 IF A%=0 THEN END`

`80 REM Carrier detected Continue..`

Q.. HOW DO I PRINT A COPY OF THE SCREEN.

A.. When in the COMMS mode press the CTRL and NUMERIC key pad No 9 at the same time.

As a Basic command enter `¶PRINTSCR`. These will only COPY ASCII characters.

Q.. CAN I SENT PRINT STREAM 8 LISTINGS DOWN LINE.

A.. Yes !. Prior to the lines containing the PRINT STREAM 8 command enter `¶SERIAL`, this will re-direct listings from the CENTRONICS port to the modem. Enter `¶CENTRONIC` to return printing to the centronics port.

Eg: `100 ¶SERIAL`

`110 PRINT #8,"K.D.S Electronics"`

Q.. CAN I RECEIVE DATA WITHOUT GOING INTO THE `¶COM` MODE.

A.. The `¶GET` command has been included for this purpose.

Eg: `200 A%=0`

`210 ¶GET,@A%`

`220 IF A%>255 GOTO 210`

`230 PRINT CHR$(A%)`

`240 GOTO 210`

Q.. HOW CAN I SEND OR RECEIVE BINARY CODE.

A.. There are two bar commands provided especially for transferring binary code, `¶SEND` and `¶RECEIVE`.

`¶SEND,25000,3000` will send 3000 bytes from address 25000

`¶RECEIVE,A,L` will load code into the computer, of the specified length and address, Eg: `¶RECEIVE,38000,3000`.

 * QUESTIONS AND ANSWERS *

Q.. HOW CAN I SEND INCOMING DATA TO THE PRINTER.

A.. When in the COMMS mode (¶COM), press the CTRL and KEYPAD number 3, this will immediately direct all incoming data to the centronics port. Pressing again switches printer OFF.

From Basic enter ¶PRINTER,1 all data will still be displayed on screen.

Eg: 300 ¶PRINTER,1: REM Directs to printer

Q.. CAN I SEND WORDPROCESSOR FILES DOWN LINE.

A.. Yes, the text can be prepared and SAVED to TAPE OR DISC then if this needs to be sent while in the COMMS mode, press SHIFT and KEYPAD No 3. after having selected to read from tape or disc, the file name will need to be entered. Press the ENTER key when ALL the filename has been entered.

In Basic ¶SWREAD,@filename,screen display

Screen display should be 0 or 1, this echos to screen.

Eg: 400 name\$="TEXT"

410 ¶SWREAD,@name\$,1

Q.. IF ON LINE I FIND I NEED A LINE FEED ON THE SCREEN HOW DO I GET ONE.

A.. Press CTRL and KEYPAD No 4.

Q.. I'M ALWAYS LOADING OR SAVING FILES TO DISC, DO I NEED TO KEEP SELECTING T or D.

A.. No, press CTRL and SHIFT keys, release and then press KEYPAD No 2. All data will be saved or loaded from disc.

Q.. WHEN I CONTACTED A BULLETIN BOARD I FOUND I HAD SET THE DATA WORD UP WRONG, DO I NEED TO GO OFF LINE TO RESET IT.

A.. No, press the CTRL and SHIFT KEYS, release and then press KEYPAD No 1. The DATA WORD menu will be displayed, when the selection has been made the program will return to the COMMS mode.

Q.. CAN I SPOOL TO TAPE OR DISC.

A.. Yes, if already on line press the SHIFT and KEYPAD No 1, select T or D to spool to, then enter the filename to be used followed by the filetype. Press the same keys to stop SPOOLING data.

Q.. CAN I DISPLAY ON MY MONITOR WHAT IS BEING TRANSMITTED.

A.. Yes, enter ¶SCRECHO,1 before entering ¶MODEM or ¶COM. ¶SCRECHO,0 will stop displaying keyboard entries. This can also be turned ON and OFF when in COMMS mode by pressing CTRL and KEYPAD No1.

Q.. IS X-ON and X-OFF AVAILABLE.

A.. Yes, select when on line by pressing SHIFT and KEYPAD No 9. Also selectable using the bar command ¶XCONTROL

 * QUESTIONS AND ANSWERS *

Q.. IS IT POSSIBLE TO SEND AND RECEIVE DATA USING XMODEM PROTOCOL.

A.. Yes, from within the COMMS mode and using the bar commands. When in COMMS press CTRL and KEYPAD No 5 to receive or press CTRL and KEYPAD No 6 to send data. From Basic ¶DOWNLOAD is used to receive and ¶UPLOAD is used to send. ¶DOWNLOAD will receive data and save it to tape or disc. ¶UPLOAD will load file from tape or disc and sent it down line.

```
Eg: Receive= 500 R$="DATA1"
          510 ¶DOWNLOAD,@R$,0 :REM 0=BASIC
To Send   500 S$="SENDDATA"
          510 ¶UPLOAD,@S$
```

Q.. IF I WANTED TO ESTABLISH A BULLETIN BOARD HOW CAN I DETECT A CALL.

A.. The command ¶ANSWER is included especially for this purpose. If the routine detects upto 4 rings the modem will answer, the ¶WAITCAR can then be used to detect a carrier from the callers modem.

Q.. CAN I DEFINE KEYS TO SEND ANY SPECIAL CODES DOWNLINE.

A.. Yes, the cursor and DELeTe keys can be used.
 EG: ¶CURKEY,del,del+1,cur/left,cur/right,cur/up,cur/down
 40 ¶CURKEY,8,16,8,9,11,10 (Default settings)

Q.. HOW DO I STORE RECEIVED DATA.

A.. A the BUFFER is available to the user to store data in MEMORY, or the user can SPOOL data or DOWNLOAD data to DICS/TAPE

Q.. HOW DO I SAVE A SCREEN TO TAPE OR DISC.

A.. It is possible to save screens from basic using ¶SAVESCR. It is more likely that a user will want to save a screen while in the COMMS mode it can be saved by pressing SHIFT and KEYPAD No 8. Only ASCII characters printed on the screen will be saved.

Q.. HOW DO I CHANGE SCREEN MODES WHILE ON LINE.

A.. Press CTRL and KEYPAD DOT, the next screen mode UP will be selected, (0 to 1 1 to 2 2 to 0).

Q.. CAN I CHECK TO SEE WHICH KEYPAD OPTIONS ARE SET AT ANYTIME.

A.. Yes, press CTRL and KEYPAD No 0, press any key to return. From BASIC use ¶STATUS, you can also get a hardcopy by using ¶PRINTSCR.

Q.. CAN I SEND A BYTE OF DATA AT A TIME.

A.. Yes, by using ¶PUT.
 EG: 500 FOR A=32 TO 255
 510 ¶PUT,A
 520 NEXT A
 OR.. 500 B\$=INKEY\$: IF B\$="" GOTO 500
 510 ¶PUT,ASC(B\$)
 520 GOTO 500

***** BAR COMMAND EXAMPLES *****

**** AUTO DIAL A BULLETIN BOARD ****

```

10 %RESET:CLS:REM INITIALISE SYSTEM
20 INPUT "Enter NUMBER to DIAL",Z$: REM NUMBER TO DIAL
30 A%=0 : REM VALUE SET TO ZERO PRIOR TO ICARRIER COMMAND
40 %BAUD,1,0 : REM SET BAUD RATE TO 300/300
50 %WORD,6 : REM SET DATA WORD LENGTH 8: NO PARITY : 1 STOP BIT
60 %DIAL,@Z$ : REM DIAL NUMBER
70 %WAITCAR,@A%: IF A%=0 GOTO 110
80 %COM : REM CARRIER OK. SCREEN TO SCREEN COMMUNICATION
90 REM: RETURN TO BASIC BY PRESSING SHIFT AND TAB KEYS SIMULTANEOUSLY.
100 %OFF:END :REM GO OFF LINE
110 %OFF:CLS:PRINT "NO ANSWER": REM NO CARRIER
120 PRINT "KEY R TO RE-DIAL":PRINT "KEY Q TO QUIT"
130 PRINT "KEY N TO ENTER NEW NUMBER"
140 Q$=INKEY$:Q$=UPPER$(Q$)
150 IF Q$="N" THEN RUN
160 IF Q$="R" GOTO 40
170 IF Q$="Q" THEN END ELSE GOTO 140

```

**** AUTO ANSWER PROGRAM ****

```

10 %RESET: A%=0: REM A% SET TO ZERO PRIOR TO %CARRIER COMMAND
20 %BAUD,1 : REM BAUD SET TO 300/300
30 %WORD,6 : REM DATA WORD SET LENGTH 8: NO PARITY: 1 STOP BIT
40 %ANSWER : REM WAIT FOR CALL
50 %RTS,1 : REM SWITCH ON CARRIER
60 %WAITCAR,@A% : REM TEST FOR CARRIER FROM CALLER
70 IF A%=0 GOTO 10 : REM NO CARRIER DETECTED
80 %PUT,12 : REM SEND CONTROL CODE TO CLEAR CALLERS SCREEN
90 %SERIAL : REM REDIRECT PRINT #8 TO MODEM
100 PRINT #8,"WELCOME TO MY BULLETIN BOARD"
110 PRINT #8," 1 TO LEAVE MESSAGE"
120 PRINT #8," 2 TO VIEW MESSAGES"
130 PRINT #8," 3 TO QUIT"
140 PRINT #8
150 PRINT #8,"PLEASE ENTER YOUR CHOICE NOW"
160 B%=0 : REM B% SET TO ZERO PRIOR TO %GET COMMAND
170 %GET,@B% : REM GET DIGIT
180 IF B%>255 GOTO 170 : REM NO CHARACTER AVAILABLE
190 IF B%=ASC("1") GOTO 500 : REM OPTION 1 SELECTED
200 IF B%=ASC("2") GOTO 1000 : REM OPTION 2 SELECTED
210 IF B%=ASC("3") GOTO 2000 : REM OPTION 3 SELECTED
220 IF B%>ASC("3") THEN PRINT #8," INVALID ENTRY PLEASE RE-ENTER":
230 GOTO 160 : REM INCORRECT ENTRY MADE
500 REM THIS SECTION IS USED FOR LEAVING MESSAGES
1000 REM THIS SECTION IS USED FOR VIEWING MESSAGES
2000 REM THIS SECTION IS FOR QUITTING
2010 PRINT #8,"THANK YOU FOR CALLING. PLEASE CALL AGAIN"
2020 PRINT #8,"HANG UP NOW"
2030 %OFF : REM SWITCH OFF LINE
2040 RUN

```

THESE ARE JUST SIMPLE EXAMPLES OF WHAT CAN BE PRODUCED WITH THE BAR COMMANDS. IT IS LEFT TO THE USERS IMAGINATION AND EXPERTISE TO PRODUCE PROGRAMS FOR HIS OWN REQUIREMENTS.

PORT ADDRESSES

The ROM is addressed at number 6
 The two main I.C. chips used in the interface are the
 6850 SERIAL INTERFACE and a 8253 COUNTER /TIMER chip

8253	Counter 0	at	#FBE8	RX clock
	Counter 1	at	#FBE9	TX clock
	Counter 2	at	#FBEA	Not used
	CONTROL	at	#FBEB	
6850	Control	at	#FBEC	
	TX Data	at	#FBED	
	Status	at	#FBEE	
	RX Data	AT	#FBEF	

N.B. Data lines to the 6850 are reversed.

To set the BAUD by directly writing to the 8253 You
 need to send three bytes of data to set up one of the
 BAUD rates.

Eg: 10 OUT(&FBEB),C:OUT(&FBE8),LSB:OUT(&FBE8),MSB

Where C = which Counter is to be set.

LSB = the Low byte of a 16 bit (Binary) number.

MSB = the High byte of a 16 bit (Binary) number.

For Counter 0 RX C = 54 For Counter 1 TX C = 118

The 6850 can DIVIDE the incoming clock speed by a
 factor of 1, 16, or 64. LSB and MSB can be selected
 from the table below.

8253		6850 Divide Ratio		
LSB	MSB	1	16	64
13	0	-	9600	2400
26	0	-	4800	1200 *
52	0	-	2400	600
104	0	19200	1200	300 *
208	0	9600	600	150
161	1	4800	300	75 *

In the ROM software the 6850 is set up to divide by
 64 and the values used for the baud rates are marked
 with an asterisk. If the baud rates of 1200 RX and 75
 TX are required with the 6850 set to divide by 64 see
 example below.

RX: 10 OUT(&FBEB), 54:OUT(&FBE8),26:OUT(&FBE8),0
 TX: 20 OUT(&FBEB),118:OUT(&FBE9),208:OUT(&FBE9),1

6850 CONTROL REGISTER.

OUT(&FBEC),WORD

6850 STATUS REGISTER.

STATUS=INP(&FBEE)

cont.

PLEASE NOTE THAT THE DATA LINES TO THE 6850 ARE REVERSED.

COUNTER RATIO AND MASTER RESET SELECT USED IN BOTH TRANSMITTER AND RECEIVER SECTIONS.

		Function (Tx. Rx.)
b7	b6	
0	0	CLOCK DIVIDE BY 1
1	0	CLOCK DIVIDE BY 16
0	1	CLOCK DIVIDE BY 64
1	1	MASTER RESET

WORD LENGTH, PARITY, AND STOP BIT SELECT.

b3	b4	b5	WORD LENGTH + PARITY + STOP BITS
0	0	0	7 EVEN 2
0	0	1	7 ODD 2
0	1	0	7 EVEN 1
0	1	1	7 ODD 1
1	0	0	8 NONE 2
1	0	1	8 NONE 1
1	1	0	8 EVEN 1
1	1	1	8 ODD 1

TRANSMITTER CONTROL BITS: CONTROLS THE INTERRUPT OUTPUT * AND RTS OUTPUT, AND PROVIDES FOR TRANSMISSION OF A BREAK.

b1	b2	FUNCTION
0	0	SETS RTS = 0 AND INHIBITS Tx INTERRUPT (TIE)
0	1	SETS RTS = 0 AND ENABLES Tx INTERRUPT (TIE)
1	0	SETS RTS = 1 AND INHABITS Tx INTERRUPT (TIE)
1	1	SETS RTS = 0 TRANSMITS BREAK AND INHABITS Tx INTERRUPT (TIE)

* TIE IS THE ENABLE FOR THE INTERRUPT OUTPUT IN TRANSMIT MODE.

ENABLE FOR RECEIVER INTERRUPT

b0 = 1 : ENABLES INTERRUPT OUTPUT IN RECEIVING MODE
b0 = 0 : DISABLES INTERRUPT OUTPUT IN RECEIVING MODE

NOTE: THEN INTERRUPT OUTPUT IS NOT IMPLEMENTED IN THIS INTERFACE.

6850 CONTROL REGISTER. OUT(&FBEC),WORD

RECEIVER DATA REGISTER FULL

- b7 = 0 : INDICATES THAT THE RECEIVER DATA REGISTER IS EMPTY
 - b7 = 1 : INDICATES THAT THE DATA HAS BEEN TRANSFERRED TO THE RECEIVER DATA REGISTER AND STATUS BITS STATES ARE SET (PE,OV RN,FE).
1. THE READ DATA COMMAND ON THE HIGH-TO-LOW E TRANSITION OR A MASTER RESET CAUSES b7 = 0.
 2. A "HIGH" ON THE DCD INPUT CAUSES b7 = 0 AND THE RECEIVER TO BE RESET.

TRANSMITTER DATA REGISTER EMPTY

- b6 = 1 : INDICATES THAT THE TRANSMITTER DATA REGISTER IS EMPTY.
 - b6 = 0 : INDICATES THAT THE TRANSMITTER DATA REGISTER IS FULL.
1. THE INTERNAL Tx TRANSFER SIGNAL FORCES b6 = 1.
 2. THE WRITE DATA COMMAND ON THE HIGH-TO-LOW E TRANSITION CAUSES b6 = 0.
 3. A "HIGH" ON THE CTS INPUT CAUSES b6 = 0.

DATA CARRIER DETECT

- b5 = 0 : INDICATES CARRIER IS PRESENT.
- b5 = 1 : INDICATES THE LOSS OF CARRIER.

1. THE LOW-TO-HIGH TRANSITION OF THE DCD INPUT CAUSES b5 = 1 AND GENERATES AN INTERRUPT (b0 = 1),(IRQ=0)
2. READING THE STATUS REGISTER AND Rx DATA REGISTER OR MASTER RESETING THE ACIA CAUSES b5 = 0 AND b0 = 0.

CLEAR TO SEND

THE CTS BIT REFLECTS THE CTS INPUT STATUS FOR USE BY THE MPU FOR INTERFACING TO A MODEM.

NOTE:THE CTS INPUT DOES NOT RESET THE TRANSMITTER.

FRAMING ERROR

- b3 = 1: INDICATES THE ABSENCE OF THE FIRST STOP BIT RESULTING FROM CHARACTER SYNCHRONIZATION ERROR FAULTY TRANSMISSION,OR A BREAK CONDITION.

THE INTERNAL Rx DATA TRANSFER SIGNAL CAUSES b3 = 1 DUE TO THE ABOVE CONDITIONS AND CAUSES b3 = 0 ON THE NEXT Rx DATA TRANSFER SIGNAL IF CONDITIONS HAVE BEEN RECTIFIED.

OVERRUN ERROR

- b2 = 1: INDICATES THAT A CHARACTER OR A NUMBER OF CHARACTERS WERE RECEIVED BUT NOT FROM THE Rx DATA REGISTER PRIOR TO SUBSEQUENT CHARACTERS BEING RECEIVED.

THE READ DATA COMMAND ON THE HIGH-TO-LOW E TRANSITION CAUSES b2 = 1 AND b7 = 1 IF AN OVERRUN CONDITION EXISTS. THE NEXT READ DATA COMMAND ON THE HIGH-TO-LOW E TRANSITION CAUSES b2 = 0 AND b7 = 0.

PARITY ERROR

- b1 = 1: INDICATES THAT A PARITY ERROR EXISTS.THE PARITY ERROR BIT IS INHIBITED IF NO PARITY IS SELECTED.

THE PARITY ERROR STATUS IS UPDATED DURING THE INTERNAL RECEIVER DATA TRANSFER SIGNAL.

INTERRUPT REQUEST

THE INTERRUPT REQUEST BIT IS THE COMPLEMENT OF THE IRQ OUTPUT.ANY INTERRUPT THAT IS SET AND ENABLED WILL BE AVAILABLE IN THE STATUS REGISTER IN ADDITION TO THE NORMAL IRQ OUTPUT.

6850 STATUS REGISTER. STATUS=INP(&FBEE)

CONNECTIONS to the 25 Way "D" Connector

Pin 1 Ground
 Pin 2 TX. Transmitter signal out
 Pin 3 RX. Receiver signal in
 Pin 4 RTS. Request to Send signal out
 Pin 5 CTS. Clear to Send signal in
 Pin 7 Ground

If the interface is used with THREE wires only (RX,TX,GROUND) then connect Pins 4 and 5 together.

Using the INTERFACE for driving a SERIAL PRINTER

The user can use the BAR COMMANDS to redirect the printer output from the centronics port to the interface with the small listing below.

10 ¶BAUD,1		Interface.	Printer.
20 ¶WORD,6	Connect	Pin 2 (Tx)-----	Pin 3 (Rx)
30 ¶SERIAL		Pin 7 (Gnd)-----	Pin 7 (Gnd)
40 ¶RTS,1		Pin 5 (CTS)-----	Pin 20 (DTR)

The BAUD rate can of course can be set to TRANSMIT at 75 (3), 300 (1) or 1200 (2 or 4). The DATA word can also be set to suit your printer, see pages 19 onward.

BAR COMMANDS available when the interface has NOT been switched on at the initial stage are listed below.

¶BAUD	[]	¶WORD	[]
¶SERIAL		¶CENTRONIC	
¶MENU		¶SENDSCR	
¶PRINTSCR		¶SAVESCR	[]
¶NORMAL		¶ACTED	
¶GRAPHIC		¶DISPLAY	[]
¶RFILE	[]	¶SWREAD	[]
¶RTS		¶CTS	[]

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