

Oricall BBS software – Version 1.05 3/5/93

Welcome to the world of

ORICALL

The U.K.'s only bulletin board for
the Oric computer !!!!!

Online 9:30 p.m. to 11.30 p.m.

Monday, Thursday, and Friday

Please respect these days and hours

Sysop: Nick Haworth

Press [Return] to continue:

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The purpose of this manual is to guide you through everyday use of the Oricall BBS software and its supplementary utilities. Please take the time to read it thoroughly, particularly if you are new to Bulletin Boards, and have it by you for reference when you call. Please take care to note the special instructions on page 7 for uploading software to the BBS.

But first a few preliminaries.

HARDWARE

The software has been designed and written for the Oric Atmos only. It runs on both tape and disc, but currently there is no file transfer, message upload or screen save facility for cassette users.

In order to access the bulletin board via the telephone line you must have an RS232 interface and V23 (1200/75) Modem. The Oric Modem and interface is recommended as the software has been specifically written for it. This software can be also used to call other Bulletin Boards – see Appendix 2.

Disc Users:

Since your disc drive or disc interface already utilises the Oric expansion port, you must provide a 34-way line plug on the disc cable, positioned as closely as possible to the computer. Connect the RS232 interface to this. Ready assembled disc/modem cables are available from Mr. J. Haworth, 3 Madingley Road, Cambridge CB3 0EE for £8.50. Please state whether you are using Cumana/Opelco interface or original Microdisc, so that the correct length cable can be supplied. Alternatively if you send your existing cable the plug can be added for £6.00. Some original Microdisc leads already have this plug fitted.

You are recommended to make a backup copy disc for everyday use, retaining the supplied disc as the master copy.

Cassette users:

Connect the RS232 interface to the expansion port at the rear of the computer.

Both:

- 1) Connect the 7-pin DIN connector of the RS232 interface into the DATA socket at the back of the modem
- 2) Unplug your telephone from the wall socket and plug in the modem's telephone wire.
- 3) Plug your telephone into the PHONE socket at the back of the modem
- 4) Set the front switch to PRESTEL
- 5) Plug in the modem at the mains and check the red ON light is illuminated

THE ORIC SOFTWARE

Loading the software

Cassette users type CLOAD"" and press [Return].

Disc users press the reset button on your drive unit or interface. The software will automatically load into a menu. To use the BBS select option 1.

Using the software

When you boot the BBS disc you are presented with five options:

- 1) Run the BBS software - for connecting to and using the BBS (see below)
- 2) Run the Linker software - for converting downloaded programs (see Appendix 1)
- 3) Run the Messenger software - for preparing messages to upload and reading/editing saved screens as text files (see p.5)
- 4) Run the Reader software - for reading saved screens (see p.6)
- 5) Exit to Basic

Assuming you have selected option (1), follow the instructions on the loading screen to connect with the bulletin board.

The first time you call the bulletin board you will be asked to provide registration details; follow the prompts on screen. The only things to note are firstly that when entering a telephone number use a dash (-) rather than a space between the STD code and the local number, and secondly if you do not wish to enter your work number, or you do not have one, simply repeat your home number. The information for which you are asked is needed for the proper functioning of the bulletin board software. It will be treated in complete confidence and apart from your name and home town is **not** available to other users of the board. On your first call as an unregistered user you will be able to access general message areas, news areas and file listings, but you will not be able download files from the BBS until you have been registered. Your registration will be approved within 24 hours and could even occur whilst you are still on line.

When asked for your personal password it may be wise to write it down until you get used to using it each time you log on. If you should forget it, log on as GUEST with the password GUEST and page me or leave me a note in the Private Mail Message area giving your name and birth date to enable me to check the user file. Because the BBS does not reveal your password even to me, you must tell me a new one which I can enter into the system for you.

On rare occasions you may find spurious or false characters appearing, almost certainly due to you having got a poor line. The chances are Nick will notice and break in to help you. You will probably need to log off using '(G)oodbye' from the Main Menu and redial the BBS to obtain a better line.

Finally, if at any time the BBS seems not to be responding, simply press [Return].

USING THE BBS

Main Menu

The options listed below are available. Select them by typing the bracketed letter followed by [Return]. For the remainder of this section of the manual, explanations are provided where necessary – some options speak for themselves.

(M)essage Menu – post and read mail (see below)

(F)ile Menu – download programs from the BBS and upload your own files to the board (see p.6)

(L)atest news on the Oric front – The BBS's very own newspaper (see p.9)

(D)atabase – a fully-featured database to search for info (see p.9)

(U)ser List – See who else is registered, each has their own private mail box

(C)hange your settings – Use with caution! (see p.10)

(S)tatistics – Check your own use of the BBS

(P)age the Sysop – Call Nick or Jon for a LIVE chat!!

(Y)our call statistics – What's happened this call

(T)odays callers – NOTE: Fixed 80 column format looks wrong (still readable though)

(G)oodbye (log off) – cheerio! (see p.10)

The options indicated above with a page number will now be described in turn.

SPECIAL NOTE: If at any time you should find yourself unexpectedly back at the 'Ready' prompt, simply type 'RUN' and press [Return] repeatedly until you are back where you were in the BBS. If you get hopelessly stuck, press the 'reset' button underneath the Oric and type 'RUN' and [Return] repeatedly.

Message Menu

(1) Select a new message area

You always start in the message area that you last visited, even on a previous call. This command enables you to switch to other areas. In the public areas you can request help from all users or provide news/information items to anyone who reads the area by addressing your letter within these areas to 'ALL'. It is always worth a browse through the public areas while on-line. Registered users may send an identical private letter to all users by addressing it within the Private Mail area to '@ALL'. Areas are as follows:

Private Mail	(only readable by the addressee)
Letters to Dave...	(private or public at your discretion)
Letters to Jon...	(ditto)
Problem Area	(public, ask for that much-needed help)
Adventure Helpline	(public, for you adventurers)
Games World	(public, for all those pokes and tips)
Market Place	(public, for your sales and wants)

(R)ead messages in current area

After selecting the area you wish to read, the options here are:

(F)orward:	Read in forward order starting at a certain message number
(R)everse:	Read in reverse order starting at a certain message number
(I)ndividual:	Read certain messages by number
(N)ew Messages:	Read all new messages
(M)arked Messages:	Read all messages that you have marked with the "scan" option.
(S)electd:	Search message database by search string in the FROM, TO, and SUBJ fields.

Remember to select '(R)everse' when browsing for the most recent messages (i.e. latest first).

(P)ost a new message

The prompts are self explanatory. You must enter the name of the person to whom you are sending the message, and give the message a subject title. You are then given the option to '(C)hange' anything. If all is correct hit [Return], and you are presented with the message screen. At this point you can simply type in your message, or make use of the message sender (see 'Messenger' on p.5). To complete your message press [Return] on a blank line. You will then be given these editing options:

(C)ontinue:	Continue adding to your message
(D)elete:	Delete a line in your message
(E)dit:	Edit a line in your message. You can enter strings to be replaced or deleted. To finish editing a line hit return at the "Old String?" prompt
(F)ormat:	Centre, right justify, or left justify a line in your message
(I)nsert:	This will allow you to insert a line in your message
(J) Subject:	Alter the subject of your message
(L)ist:	View your message line by line
(R)eplace:	Replace a line in your message
(S)ave:	Save your message in the database
(Q)uit:	Abort your message entirely

In most cases you will want to send the message by selecting the option '(S)ave' message in the database, and replying 'N' to the prompt 'Save files with this message'.

(Q)uick-scan messages

This is a search and find utility. The menu criteria to choose from are self explanatory.

(C)heck your personal mailbox

If there is mail present in your mailbox, you are given the option of reading it, or replying to it. Please note that you cannot delete the messages. Messages are automatically deleted after 14 days.

(S)can messages

A more detailed version of quick-scan with the option to mark messages for later reading.

(D)isplay your message statistics

Display information on the message base and on your message activities.

(M)ain Menu**(G)oodbye (log off)****'Messenger'**

This feature enables you to prepare messages before you come on line and then simply upload them into the message screen instead of typing them in while on-line. It utilises a version of Scrivener from the PD Library, edited to work by default in the 37-column mode of the Bulletin Board. It also includes the facility to load a previously saved BBS screen as a text file for editing and printing.

Preparing messages off-line

When you boot up the BBS disc, option (3) 'Run the Messenger software' takes you into Messenger. This has all the features of a word processor except that word-wrap should be left OFF for BBS purposes. This means that what you see as you prepare the message is what you get on the BBS – a first WYSIWYG for Oric?! Pressing CTRL-? accesses the help screen listing all commands. Type in your message (you do not type in the addressee or subject at this stage) and save it to disc with the CTRL-K command. When asked for the filename, do NOT type in any extension – the message is automatically saved in .MSG format. Exit Messenger with CTRL-Q, and you will return to the BBS software disc menu. Note that these files can be saved to the BBS software disc, or to a blank formatted disc. Messages are restricted to 25 lines of 37 characters.

Sending messages whilst on-line

Follow the procedure set out on page 4 above under '(P)ost a new message' to the point where you would otherwise type in your message. Instead of doing so, press ESC and select the option '(S)end a message'. You will be prompted to insert the disc containing the message you want to send. Check it is in the drive, and press any key. The directory of the disc is displayed. Type in the name of the message file you want to upload (excluding the .MSG extension) and press [Return]. You will then be prompted to ensure the BBS disc is in the drive. Do so, and press [Return]. The message will then be uploaded into the 'letter' you are sending just as if you had typed it in, but about 10 times more quickly! When the message has been uploaded you then complete it by pressing [Return] on a blank line as usual, and unless you wish to '(Q)uit', select '(S)ave the message'.

The advantage of this method is that you can prepare a number of messages for different people before you ring the BBS, and then post them in turn in as short a time as possible, saving phone charges.

Editing/printing saved screens (see next page)

While in Scrivener, press CTRL-K and select 'B – Load BBS screen'. You will be shown a directory and asked for the screen file number. Enter just the number, press [Return], and the screen will be converted automatically into a text file. Use 'R – Return' as usual to return to the document screen, and continue editing, printing etc. as normal.

Also on the BBS disc is a program called CONVERT.COM. This is a utility for converting text files from Scrivener (.MSG) to Easytext (.TXT) format and vice versa. To use select '(5) Exit to Basic' and type 'CONVERT' and [Return]. Follow the screen prompts, entering the full filename (with extension).

Save screen to disc feature

Because your messages are held on the Board in P.C. format files, it is not possible to download them directly. However, there is a way round this. The BBS software includes a special feature that enables you to save any current screen to disc (only). This means that you can save a screen for later reading at your leisure, thus saving time on the BBS, or, for example, swiftly copying important information.

To save the current screen, press CTRL-S at any time whilst you are in the Bulletin Board. The first screen will be named BBSSCR.1, the second BBSSCR.2 and so on to a maximum of 999 screens! They are saved in standard text screen format, and can be subsequently re-loaded simply by typing the file-name at the 'Ready' prompt. You can fit about 100 screens on a blank disc.

The ORICALL disc includes option (4) 'Run the Reader software' which allows you to read each of the stored screens on a disc in numerical order simply by repeatedly pressing the Space Bar. Furthermore, 'Messenger' (see p.5) includes the facility to load in a screen as a text file for editing and printing.

File Menu

This is the area which uses software which is very specific to the Oric. Please read this section of the manual thoroughly and be sure to follow the described sequence of commands carefully.

(F)ile List

Files (the PC word for programs) are stored in areas in the same way as messages. They are grouped according to the type of program and its availability. The areas are as follows:

PD Software library	- available to all free of charge
New uploads to the sysop	- where to send your programs for the BBS
Arcade games	- your uploaded programs
Adventures	- ditto
Strategy/simulations	- ditto
Utilities	- ditto
Files for OUM only	- programs for Dave's eyes only
Files for CEO only	- programs for Jon's eyes only
Latest BBS software	- the latest versions of BBS program software and the manual

The bulletin board system defaults to the PD Software Library area when you first log on. Selecting this command gives a list of all the programs in the current file area. Make a note of the name (including extension) of any files you want to download.

(D)ownload a file

- 1) You will be asked for the filename of the program you want to download. Enter it in full including its extension (eg. DESIGN.COM) and press [Return].

NOTE: You have to be in the area in which the program is located before you download.

There should be a short pause and the BBS will give you the file size and announce that it is tagged for downloading. You now are given the options to (A)dd to the taglist, (D)elete

from the taglist, (S)tart the transfer or (A)bort the transfer. PLEASE NOTE that you can only tag ONE file at a time for downloading. Downloading of multiple files from one command is not as yet implemented.

- 2) Unless you decide to abort downloading the tagged file, select '(S)tart the transfer'. Then press the [ESC] key and the screen will clear displaying '(T)ransmit or (R)eceive'. Select receive by pressing 'R'.
- 3) You will then be prompted to check the BBS software disc is in the drive. Press [Return] to continue. The screen will now display a table of information on the download, showing the current filename being downloaded, the estimated time for downloading, the length of the file, the number of bytes received, the number of blocks remaining to be received, and a progress bar. NOTE: You will have to wait approximately 5 to 10 seconds for this information to appear.
- 4) When the file has downloaded you will be asked to insert a blank formatted disc on which to save the downloaded file. You can if you wish leave the BBS disc in the drive and save to that, although it would then be better to use a copy disc. So, either put in a blank formatted disc and press [Return], or simply press [Return]. The downloaded file will be saved to disc in a special format for later conversion to a usable Oric file. See Appendix 1 (Converting downloaded files). The screen will clear and you must then press [Return] to return to the File menu.

IMPORTANT NOTE: Because the BBS software is interrupt-driven, the speed of disc access is reduced during file transfers. This is only really noticeable with large programs. After leaving the BBS (and before using Linker or Reader) re-boot the BBS master disc.

Files are downloaded at 1200 bps (bits per second), i.e. approximately 8 seconds per 1K.

(U)pload a file – THIS OPTION SHOULD NEVER BE USED BY YOU

To upload a file to the BBS you **DO NOT SELECT THIS OPTION** – it will be selected automatically by the specific Oric routine now to be described. However you must be in this files menu (in other words have selected '(F)' from the Main Menu) prior to uploading a file.

To upload a file:

- 1) (C)hange file area (see below) to 'New uploads to the sysop'.
- 2) Press [ESC] while at the File Menu and then select transmit by pressing 'T'. You will be prompted to insert the disc containing the file you wish to upload. Again, you can have the prepared file on your BBS disc if you wish to save swapping discs. So, ensure the disc with the file on is in the drive, and press [Return].
- 3) You will be shown a directory of the disc and asked for the filename. Now type in the filename (excluding the extension) and press [Return], followed by the extension (excluding the dot). Note that file names over 8 characters long will be truncated to 8 characters by the software.

- 4) The file will then load into the buffer and be transmitted automatically.
- 5) You are then prompted to put the Oricall BBS disc back in the drive. If you previously swapped discs, do so, and press [Return]. If you left the Oricall BBS disc in the drive, simply press [Return].
- 6) Transfer will now proceed automatically. The screen will display a table, which after a pause of some ten seconds or so will give similar information to that of a download. When the upload is completed you will be asked to give a description of the file. Type in your description, ending with a [Return] on a blank line.
- 7) Press 'S' to save the description, whereupon you will be returned to the BBS file menu.

Uploading takes place at 75 bps, approximately 2 minutes per K. Because of this I recommend that you only upload small files of up to 10k maximum. Anything that is over 10k which you wish to see on the bulletin board should be sent to me on disc or cassette at the address at the end of the manual. Because of this time penalty, uploading time does not count against your allowed time each day on the BBS. You will be expected though, to upload the occasional small file in return for those you download, that is one upload for every five or so downloads. This ensures the vitality of the BBS.

Each upload of a file will in addition earn you extra time for that day. Each time someone else downloads a file you have uploaded, you get additional time credited. Furthermore, if you upload files regularly, your status level will be increased, resulting in an increase in your download:upload ratio. Should you be very active on the BBS in other areas (messages, problem area, etc.) this will also affect your ratio favourably! Both downloading and uploading provide an economical way of transferring files since a cheap rate trunk call costs only about 7p per minute. There is a utility on the disc called 'COSTER.COM' that will calculate the cost of phone calls for you.

(N)ew files

Displays the new files which have been uploaded or added to the system since your last call.

(L)ocate by keyword

Finds a program according to a keyword you specify, eg. CPD-9 will locate the file DESIGN.COM. This function searches every file area.

(S)earch for file-name

As above, but searches for a specific filename including extension. Wildcards may be used.

(>) Next file area

Cycles you through the file areas.

(<) Previous file area

Steps back a file area.

(C)hange file area

Displays a list of all the file areas and allows you to select one.

(M)ain Menu

(G)oodbye (log off)

News

Treat this like a newspaper.

(O)ric User Monthly
(C)lub Europe Oric
(P)ublic Domain
(N)ew Software
(H)ardware
(L)atest BBS news
(M)ain Menu
(G)oodbye (log off)

Database

The Remote Access Database is P.C. dBASE III & dBASE III Plus Compatible. It is a simple online database system. When you select this option from the main menu you will see a scrolling title screen (which will look wrong because it is fixed 80-column format).

Press [Return], and then select 'C' and press [Return] again. You are then presented with a dot as a line prompt, and can utilise the following command language:

<u>Command:</u>	<u>Function:</u>
INFO	Display system and user information
CLS	Clears Screen and Resets FIND search to ALL
DIR	Displays directory of available databases
USE name	USE or LOAD database by name
FIND text	FIND and display record matching text
BROWSE text	FIND and list records (max fields that fit on one line)
NEXT	FIND and display NEXT record (or just press ENTER)
GOTO n	where n is the record number (also GOTO FIRST or LAST)
COUNT	FIND and COUNT occurrences of FIND
QUIT	Exit program (closes all files)

Type DIR [Return] to see a directory of the available databases. Select a file number to load the database you wish to access. You can then use the FIND, BROWSE, NEXT, etc., or simply press [Return] repeatedly to flip through the records on the database. Thus, to find a poke for 'Zebbie' you would take the following steps:

```
DIR [Return]
(Database No.) [Return]
FIND ZEBBIE [Return]
[Return] (= search all fields)
```

The first record for 'Zebbie' will then be displayed. Press [Return] to access succeeding records for 'Zebbie' (if there are any!).

Change your settings

This menu should be used with caution. Indeed, you should never need to use it. Experienced BBS users may enjoy fiddling with it! Beginners are advised to steer well clear. In case you do get involved the default settings for your Oric are listed below.

(C)alling from ... Your home town

(P)assword ... Your password will not be shown on this screen.

(%) Voice Telephone ... Your home telephone number

(L) Screen length ... 24 (The default for the Oric)

(R) Screen pause ... ON

This should be left to ON as 1200 baud is quite fast!

(S) Screen clears ... ON

Again, this should be left to ON so that the screen does not get too cluttered.

(&) Amend your mailing address

(M)ain Menu

Goodbye / Log off

(G)oodbye (Log off)

(M)ain Menu

(L)eave message to the sysop

Select this menu option when you are ready to leave the bulletin board. You will be asked whether you want to leave a message to the Sysop (me). '(L)' will take you to a normal message screen and then offline after sending a message. '(G)' will take you offline.

**PLEASE DO NOT HANG UP THE LINE WITHOUT LOGGING OFF PROPERLY!!!
FAILURE TO DO THIS RENDERS THE BULLETIN BOARD INACCESSIBLE TO OTHER
CALLERS UNTIL I NOTICE YOUR TRANSGRESSION.**

You should also know that not only are you able to page (talk directly to) me, but I can break in to chat directly with you at any time. This may well happen during your first few calls!

As a final note, I hope this software will prove only the start; please make your suggestions for its improvement, either in technical terms or simply by saying what features you would like to see changed, enhanced or introduced. Above all, have fun!

Nick Haworth
3 Petersfield Road
Duxford
Cambridge
CB2 4SF

Appendix 1

Converting downloaded files using Linker

The BBS software includes a copy of Linker, a specially written utility to convert files from their special downloaded format to the normal Oric format. Until converted, downloaded files are not usable.

Boot the BBS software disc and select option 2 from the menu. Linker will now load and prompt you to insert the disc containing the file you wish to convert, and display the directory. When you then press [Return] you will be prompted for the full file-name (including the extension). Enter it and press [Return].

Since the routine uses the Sedoric MOVE command, you may well now be prompted to ensure a Master Disc is in the drive. Do so and press [Return].

If the file is machine code Linker will then automatically convert it to Oric format, creating a new executable file. The old special format downloaded file is converted into a .BAK file.

If the file is Basic, Linker is necessarily overwritten by the new program, causing the routine to break to the 'Ready' prompt. You will be left with a screen display instructing you to type in the commands needed to complete the linking. These are:

NEW	[Return]
!MOVE, #4080, DEEK(#2C5), #501	[Return]
DOKE #9C, DEEK(#2C7)	[Return]
!SAVEU "filename", AUTO	[Return]

Type these as shown on the screen and the converted file will be saved to disc in executable format. Again a .BAK file is created.

There is a utility file called 'Killer' on the BBS disc. This will clean a disc of all .BAK files.

Appendix 2

Calling other Bulletin Boards

The BBS software is quite capable of connecting you to other Bulletin Boards. There are many hundreds of Bulletin Boards, but only a certain number allow access with a V23 modem. The procedure is identical to that used for Oricall, save that with the advance of technology the V23 carrier tone (which you hear as soon as you ring Oricall) has been relegated to fifth or sixth in line after the new faster baud rate tones. It is therefore important to pick up the right carrier tone, which essentially means waiting for some seconds until it appears. If you press the Space Bar too early, the Oric modem will hang up before the V23 tone is reached. With a Board that is new to you, the answer is to experiment by trying different delays before pressing the Space Bar.

To get you going, below are listed some of the Boards accessible with this software, together with the approximate delay time to achieve a connection. Count the seconds from the moment the first carrier tone is heard, then press the space bar, and replace the phone handset.

Cyclone BBS	0603 260973	9 seconds
Airtel BBS	0342 717800	8 seconds
Pacific Lightning BBS	0732 845338	9 seconds
Tug II BBS	0905 775191	9 seconds

Please note that you cannot download software or text files from these boards, they have no Oric area!

If you are a Maplin customer, you can place your orders by credit card on Cashtel, their own BBS. The number to ring is 0702 552941, and there is no need to delay – press the space bar as soon as you hear the carrier tone.

Further Boards and their numbers/delay times will be published from time to time in O.U.M.

Appendix 3

Technical Information

The 'Oricall' Bulletin Board runs on an 8088 PC using 'Remote Access' V2.0 gamma software. The PC BBS software was originally written for 80-column screens, so there remain a few discrepancies in the screen displays. These will be hopefully corrected in time if at all possible. The BBS menus and messages can all be edited, so that as time permits they will benefit from the experience of users and myself in both their content and their colour and layout.

For all you techies out there, below is a description of the X-modem protocol used by the file transfer routines. The following terms may need deciphering:

ACK	= Ascii code #06	= Acknowledge (i.e. OK to continue)
NAK	= Ascii code #15	= Negative acknowledge (i.e. not OK to continue)
EOT	= Ascii code #04	= End of transfer
SOH	= Ascii code #01	= Start of header

The Bulletin Board software utilises the basic X-modem file transfer protocol. When transferring files between computers using the telephone system, there is always the chance that electrical noise will result in data transmission errors. To ensure proper transfer of files it is necessary to detect data transmission errors and to retransmit data that contains errors. Most people think that asynchronous parity error detection provides that capability. It does not. Parity error detection does tell you when a data transfer error has occurred, but it is up to you to retransmit the data to correct errors. The problem is that parity error detection is not actually performed by any Oric communication packages. To ensure "error-free" data transfer you need a protocol file transfer technique.

A protocol is a set of rules and conventions that apply to a specific area of communications that allow participants to properly communicate regardless of the hardware brand or software package being used. The protocol file transfer is a set of rules for transferring files which specifies a set of ASCII handshaking characters and the sequence of handshaking required to perform certain file transfer functions. Protocol handshaking signals allow communication software to transfer text, data and Basic and machine code files, and to perform sophisticated error-checking.

The X-modem protocol is one specific file transfer protocol that has become a default standard in personal communications because of its widespread use on bulletin boards and because of its inclusion in low cost personal computer communication packages such as ORICALL BBS software. By providing you with this insight into protocol transfer and explaining in detail the operation of the X-modem protocol, I hope to bring to the Oric a "standard protocol". Users of Oric communication software deserve a standard protocol that will allow them to transfer files to or from other computers.

The X-modem protocol is illustrated in Figure 1. As you can see from that figure, X-modem does not begin the transfer of data until the receiving computer signals the transmitting computer that it is ready to receive data. The Negative Acknowledge (NAK) character is used for this signal and is sent to the transmitting computer every 3 seconds until the file transfer begins. If the file transfer does not begin after 9 NAK's are sent, the process has to be manually restarted.

After a NAK is received, the transmitting computer uses a Start of Header (SOH) character and two block numbers (a true block number followed by a 1's complement of the number) to signal the start of a 128-byte block of data to be transferred, then sends the block followed by an error-checking checksum. The checksum is calculated by adding the ASCII values of each character in the 128

character block; an AND #FF is then performed on the resulting value to give the checksum. After each block of data is transferred, the receiving computer computes its own checksum and compares the result to the checksum received from the transmitting computer. If the two values are the same, the receiving computer sends an Acknowledge (ACK) character to tell the receiver to send the next sequential block. If the two values are not the same, the receiving computer sends the transmitter a NAK to request a retransmission of the last block. This retransmission process is repeated until the block of data is properly received or until 9 attempts have been made to transmit the block. If the communications link is noisy, resulting in improper block transmission after 9 attempts, the file transfer is aborted.

X-modem uses two block numbers at the start of each block to be sure the same block is not transmitted twice because of a handshake character loss during the transfer. The receiving computer checks the transmitted block to be sure that it is the one requested and blocks that are retransmitted by mistake are thrown away. When all data has been successfully transmitted, the transmitting computer sends the receiver an End of Transmission (EOT) character to indicate the end of file.

X-modem error-checking is superior to normal asynchronous parity error checking. The parity method of error-checking is 95% effective if the software on the receiving end checks for parity errors. X-modem error-checking is 99.6% effective, and the software on the receiving end must check for errors. Parity errors detected also do not result in automatic retransmission of the bad data; X-modem detected errors result in data retransmission until no errors are detected or until 9 retransmissions have been attempted.

I hope I have given the X-modem protocol a real boost in the Oric world by including it in this package.

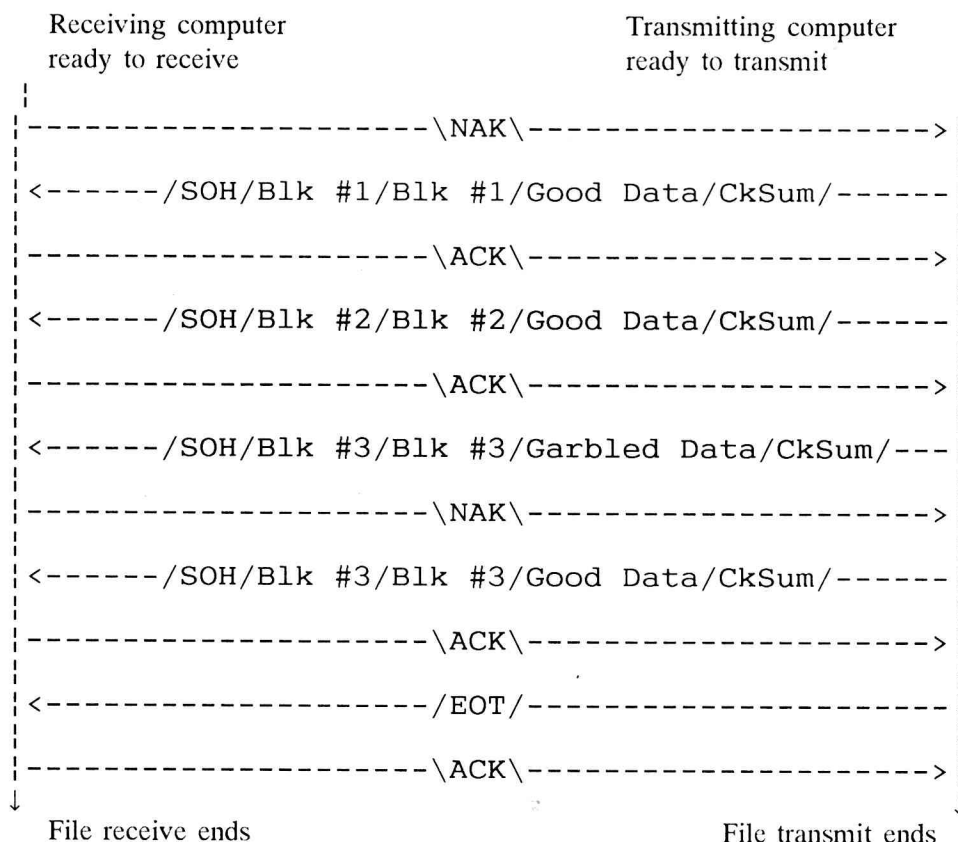


Figure 1