Contents

1. Introduction

The main purpose of ArcFax, is to allow you to use your fax modem for sending and receiving faxes. It can also be used with voice and data modems for handling voice messages and transferring files.

Fax Modems

The fax modem, is the combination of two competing trends in communications over the last 20 years - the data modem and the fax machine.

Data modems, were developed to allow computers to communicate via telephone lines. As time has gone by, they have evolved from slow and primitive 300 bps devices to todays sophisticated high speed 14,400 bps modems, with built in error correction and data compression. Data modems allow access to the familiar services like bulletin boards, Prestel, and electronic mail.

Fax machines, come from the long time need to transmit pictures over telephone lines. In recent times, they have become popular, because they offer some of the benefits electronic mail in a form that is accessible to non-experts.

There are many disadvantages to fax machines, instead of sending the data composing a message, they literally transmit a picture (facsimile) of the printed form of it. This means that the message must be printed before being transmitted and must be retyped on receipt if it is to be used further. It also means that much more data is transmitted than need be. Even with the data compression used by fax machines, the typical one page letter will occupy ten or twenty times the space necessary to hold just the data composing it.

The single reason for the popularity of fax, is that it is easy to use and understand, the transmission of data directly is confused by a vast number of competing standards.

The fundamental technology of fax machines and data modems is the same, a high speed modem exists in both. A modem (modulator-demodulator) is a way of using a carrier tone to transmit data over a telephone line. Given this, it is no surprise that data modems can be extended to communicate with fax machines.

Once the fax capability is accessible in the same way as a data modem, there are several advantages. Faxes can be sent without being printed on paper and rescanned - this gives improved quality. Received faxes can be processed or used directly in documents.

For data modems, there is a standard software interface - the so called "Hayes AT" command set. For fax modems, the equivalent, is "Class 2" or "Class1". As in the early days of data modems, there are other competing (and obsolete) standards such as "CAS" and "Sierra/Send Fax".

Class 2, is more sophisticated than Class 1. In Class 1 more of the fax protocol has to be handled by ArcFax. Class 1 and 2, should not be confused with "Group 3". Group 3 is the name of the protocol used for sending faxes. Class 1 or 2 are only used to control your modem. All the current fax modems will talk to Group 3 fax machines.

To find out which classes your modem supports, use a terminal program and type AT+FCLASS=?<RETURN>

Voice Modems

Most modems are implemented using digital signal processing, it is a short step from using these techniques on modem tones, to using them to digitise speech. The ultimate evolution of the modem, is the so called 'voice' modem, these allow voice signals on the telephone line to be turned into digital data which can be fed into the computer via the serial port, and allow the reverse operation - turning data on disc into sound on the phone line.

The most obvious use of this is to use your computer as an answering machine. When combined with other modern modem features like 'adaptive answer' which can determine if an incoming call is voice or fax, and the ability to detect touch tones on the line, anything from a simple fax switch which ensures that fax calls are answered, and voice calls not; to complex fax on demand and voice mailbox systems become possible.

As with Fax there is a command set for voice, we shall refer to it as Class 8, however it is not as well defined as Class 1 and Class 2.

Getting started

Successful use of ArcFax requires installation of the ArcFax program, your modem, and a printer driver. The latter two procedures are problematical, so the whole of the next chapter is devoted to the subject. The following two chapters explain the basic processes of sending and receiving faxes. Further chapters explain things in more detail. The last chapter contains hints and tips for using ArcFax and some interesting points. It is essential that you read chapter 2.

Often in what follows faxes, files and voice messages can be used interchangeably - since most people will just want to send faxes, that is what we will usually call the objects being sent or received.

2. Installation

There are three components of ArcFax, the ArcFax program, the ArcFax printer drivers and your modem. These will be dealt with in turn.

Program Installation

ArcFax is supplied on a single floppy disc. You should make a backup copy of this for day to day use. A text file called *!ReadMe* is supplied on the disc and notes new features and additions to the program. ArcFax can be installed on your hard disc or another floppy by dragging the !ArcFax application to the desired destination. ArcFax is run by double clicking on the !ArcFax icon, it will then install on the icon bar.

If you have RISC OS 2, then you need to have version 3.75 (or greater) of the shared C library in the modules subdirectory of your !System directory (usually on Applications disc 1). If this is not present, the program will fail to run and give an error message. A copy of CLib version 3.75 is included on the ArcFax disc. To update your System resources (including the CLib module), you should insert the disc, open a window on it and double click the Sysmerge application and follow any instructions that are issued. This will ensure that both ArcFax and other new programs will run correctly.

Once ArcFax is installed on the icon bar, you can press the menu (middle) mouse button over the ArcFax icon bar icon and get the ArcFax menu.

ArcFax
Info ⇩
Scan ⇩
Directory... F2
TX batch... ⇧F6
RX batch... F6
Voice...
Configure...
Quit

Info leads to a program information box which will show you which version of the program you have. Please quote this in any correspondence.

The second entry **Scan** leads to a menu concerned with controlling scanners - for scanning material for faxing. See the end of Chapter 2.

Directory will open the Telephone Directory. This is used to store the names and telephone numbers of fax machines you want to communicate with.

The next entry on the menu, will open the ™**TX Batch** window. Faxes that are being sent are temporarily stored on disc. This window shows them and allows you to manipulate them.

The **RX Batch** on the other hand contains received faxes. Operation is similar to that of the **TX Batch**.

Voice opens a window that you can use to record new voice files. This option will be greyed out unless you have a voice modem.

The next entry **Configure** opens a window which allows you to set many of the parameters of ArcFax. For example how many rings it will answer incoming calls after or which fonts are used for transmitted faxes.

The final entry **Quit** terminates ArcFax and removes it from the icon bar.

Clicking on the icon bar icon with the Select button (left) will open the ArcFax Control Panel window. This lets you see what ArcFax is doing, cancel operations and initiate certain operations. Basic operation of ArcFax does not require it's use. Chapter 10 describes its operation in detail.

Sometimes the ArcFax icon will be greyed out. This can mean that ArcFax is busy however usually it shows that ArcFax is in a "quiescent" state. In this state, the icon bar icon will also be grey and more importantly, ArcFax will do nothing. It will not attempt to answer incoming calls, make outgoing ones or interfere with the serial port in any other way. This is useful, because you may wish to use an ordinary communications program with your modem without going to the trouble of removing ArcFax from the icon bar. ArcFax can be toggled into and out of this state by clicking with the Adjust button (right) on the icon bar icon. Note that it takes several seconds for ArcFax to issue the necessary commands to activate the modem.

Modem Installation

To make use of ArcFax, you will need a modem. This is connected to your computer using a lead plugged into the serial port. ArcFax will be happy with the same lead you use with your ordinary communications program.

Archimedes (9 pin)			Modem (25 pin)		
(in)	1	DCD			
(in)	2	RXD	3	RXD	(out)
(out)	3	TXD	2	TXD	(in)
(out)	4	DTR	20	DTR	(in)
	5	0v	7	GND	
(in)	6	DSR	5	CTS	(out)
(out)	7	RTS	4	RTS	(in)
(in)	8	CTS			
(in)	9	RI	8	DCD	(out)
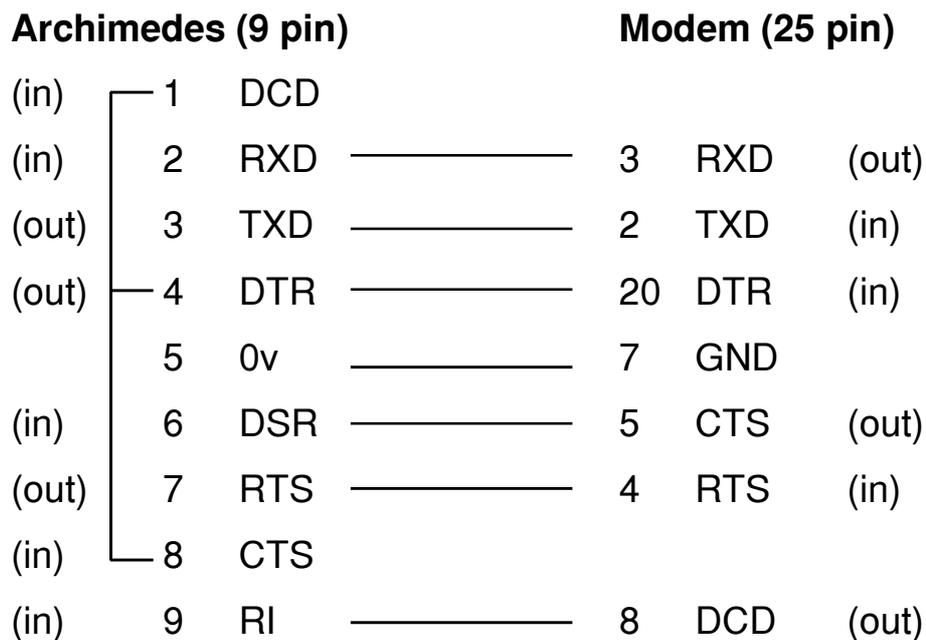
Figure 1. Traditional or Old Style modem lead.

Archimedes (9 pin)   **Modem (9 pin)**

(in)	1	DCD			
(in)	2	RXD ———————	2	RXD	(out)
(out)	3	TXD ———————	3	TXD	(in)
(out)	4	DTR ———————	4	DTR	(in)
	5	0v ———————	5	GND	
(in)	6	DSR ———————	8	CTS	(out)
(out)	7	RTS ———————	7	RTS	(in)
(in)	8	CTS			
(in)	9	RI ———————	1	DCD	(out)
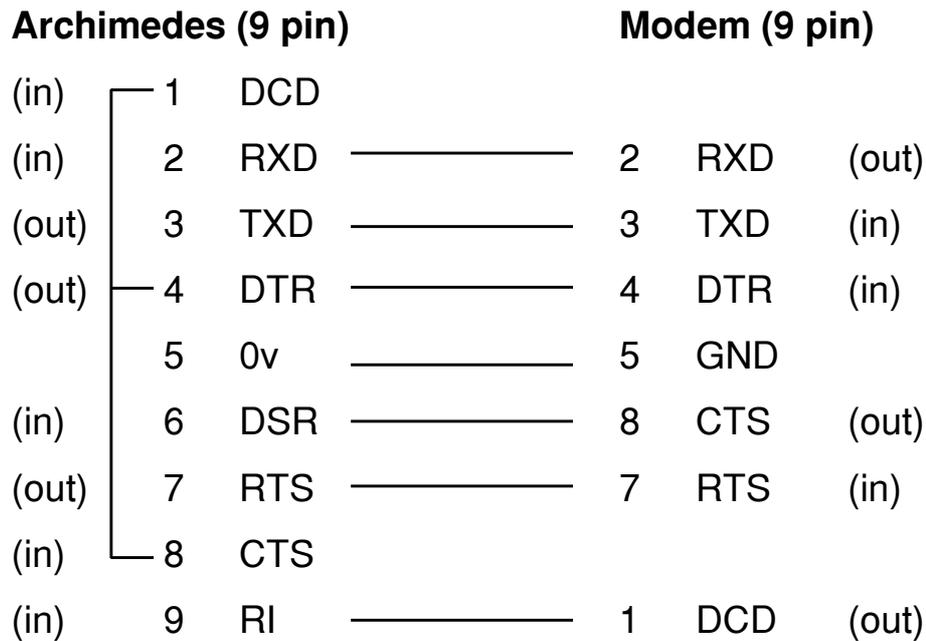
Figure 2. 9 pin version of Figure 1.

If your machine is an A540 or older (A400, A300, A3000) then you will need a special lead suitable for the Archimedes. These are widely available from Archimedes dealers etc. Your computer will not work with a standard PC lead which is what you are most likely to receive with your modem. Figure 1 shows how to wire a suitable lead, and Figure 2 shows how to wire the lead if you have a modem with a 9 pin socket.

Archimedes (9 pin)   **Modem (25 pin)**

(in)	1	DCD			
(in)	2	RXD ———————	3	RXD	(out)
(out)	3	TXD ———————	2	TXD	(in)
(out)	4	DTR ———————	20	DTR	(in)
	5	0v ———————	7	GND	
(in)	6	DSR			
(out)	7	RTS ———————	4	RTS	(in)
(in)	8	CTS ———————	5	CTS	(out)
(in)	9	RI ———————	8	DCD	(out)
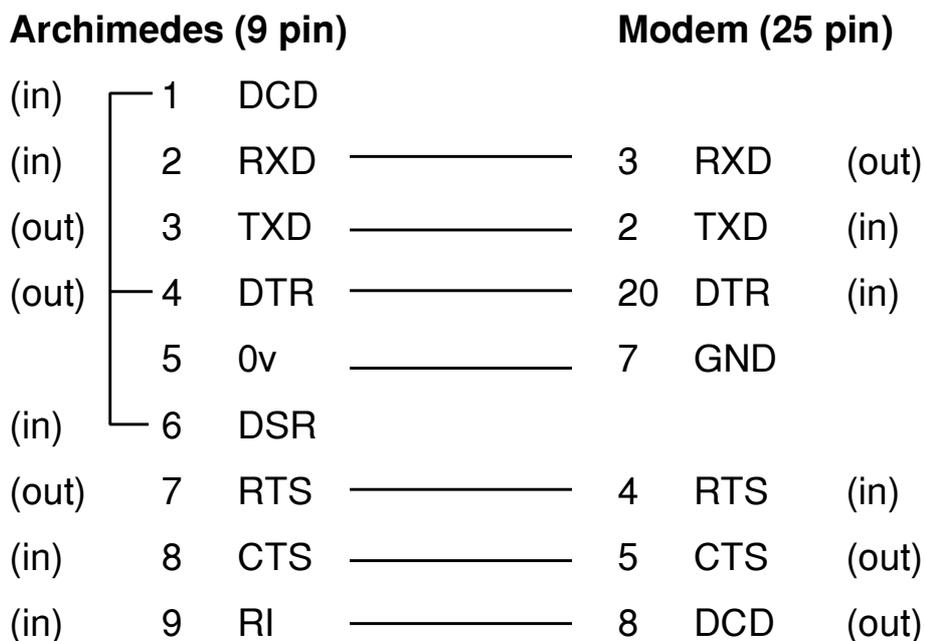
Figure 3. Canonical Acorn modem lead.

These leads are designed to reduce the effects of shortcomings in the original serial hardware on the Archimedes. A more "correct" serial lead is shown in Figure 3.

Archimedes (9 pin)				Modem (25 pin)		
(in)	1	DCD	———————	8	DCD	(out)
(in)	2	RXD	———————	3	RXD	(out)
(out)	3	TXD	———————	2	TXD	(in)
(out)	4	DTR	———————	20	DTR	(in)
	5	0v	———————	7	GND	
(in)	6	DSR	———————	6	DSR	(out)
(out)	7	RTS	———————	4	RTS	(in)
(in)	8	CTS	———————	5	CTS	(out)
(in)	9	RI				

Figure 4. PC modem lead.

If you have a newer machine an A5000 or later, then you can use a lead wired in the standard way - a "PC" or "straight through" lead. Figure 4 shows the necessary connections. This is the type of lead you will probably get supplied free with your modem, if you buy it from a PC source.

Experience has shown that all that can be guaranteed is that the first type of lead described (Figure 1 or 2) will work on all Acorn hardware. Although the other leads should work on A5000's etc. this may depend on the modem configuration etc. See !Modems on the ArcFax disc.

Long and bitter experience, has shown that the most common cause of modems not working, is wrongly or badly made modem leads. There are many ways of wiring leads that will work, and many that won't. There are also some that will work some of the time e.g. with data, but not with fax. **Correctly wired modem leads are cheap to buy. The time and money an incorrect lead will cost you will be considerably greater!**

Modem Drivers

It is possible to configure ArcFax for different types of modems. The way this works is that all communication with the modem is via a program written in the ArcFax script language - a 'modem driver'. This means that different programs can be written to cope with oddities or special features of different modems. Initially ArcFax will use a generic Class 2 driver. You can use the Modem configuration dialogue box to change drivers. See Chapter 9 if you think your modem is not compatible with Class 2.

Printer Driver Installation

When you send a fax you do so by printing from applications in the usual way. This implies you must have special printer drivers that convert the normal printed output into the special fax format. There is a difference in how you install these depending on whether you have RISC OS 2 or RISC OS 3. Installation for these will now be described in turn;

RISC OS 2 Printer Driver Installation
On the ArcFax disc, there is a printer driver !PrinterAF. Drag this to where you usually keep your printer drivers. When you want to send a fax, run !PrinterAF by double clicking on it, just like you do with PrinterDM etc.

PrinterAF is identical to the standard PrinterDM application, except for the *'PRData'* file inside it. This means you can use other versions of PrinterDM as long as you install the *'PRData'* file inside them.

In common with other RISC OS 2 printer drivers PrinterAF will not work with RISC OS 3. When you upgrade to RISC OS 3, you must throw away PrinterAF, and follow the instructions below for RISC OS 3.

RISC OS 3 Printer Driver Installation

Find and run !Printers. It will appear on the icon bar. Look at the ArcFax disc there is a printer configuration file called '*ArcFax*'. Installing ArcFax on RISC OS 3 consists of installing this file in !Printers. This is the procedure;

```
       Printers
  Info                ⇩
  Printer control...
  Queue control...
  Edit paper sizes...
  Save choices
  Quit
```
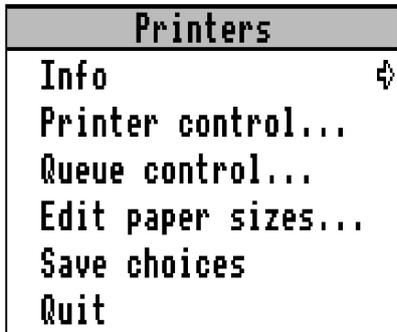
Pop up the Printers icon bar menu and select 'Printer Control'.

The Printer control window will appear. Drag the file '*ArcFax*' and drop it into the Printer control window.

```
▣▣                        Printer control                        ▣
Name        Type                        Connection  Status     ⇧
ArcFax      ArcFax                      To file     Active     ▢
                                                               ⇩
                                                               ▣
```
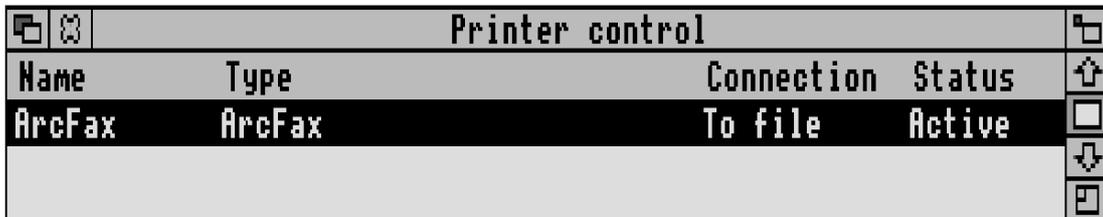
Now position the pointer over the line in the window for ArcFax and press the menu button.

```
       Printers
  Configure...
  Connection...
  Active
  Inactive
  Remove
  - - - - - - - - - - -
  Select all
  Clear selection
```
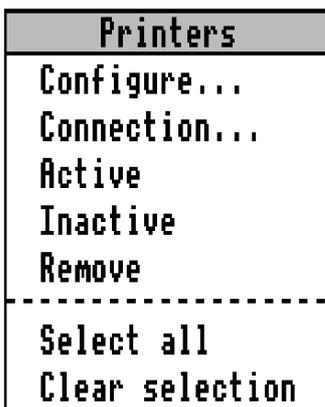
Using select choose 'Active'. Then reopen the menu and choose 'Connection'.

```
┌─────────────────────────────────────────┐
│               Connections                │
│  ┌─────────────────────────────────┐     │
│  │             ArcFax              │     │
│  └─────────────────────────────────┘     │
│        Print in background  □            │
│  ◇ Parallel                              │
│  ◇ Serial      Baud rate  │ 1200  │ ⇨    │
│                Data bits  │ 8 bits│ ⇨    │
│                   Parity  │ None  │ ⇨    │
│                Stop bits  │ 2 bits│ ⇨    │
│               X-On/X-Off  □              │
│  ◇ Net                    │       │ ⇨    │
│  ◇ NFS           Server   │       │      │
│                 Printer   │       │      │
│                Username   │       │      │
│                 Options   │       │      │
│  ◈ File        │      null:        │ ⇨   │
│            Append to file  □             │
│  ◇ Direct drive                          │
│  ┌──────────┐              ┌──────────┐  │
│  │  Cancel  │              │    OK    │  │
│  └──────────┘              └──────────┘  │
└─────────────────────────────────────────┘
```
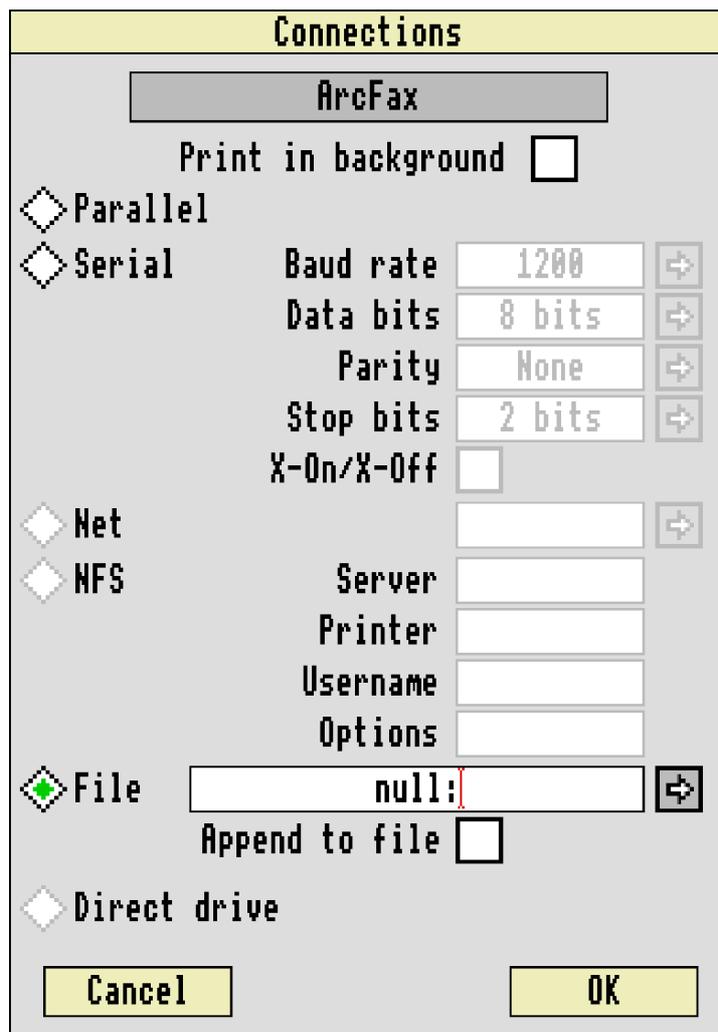
The 'Connections' window will open.

Ensure that **Print in background** and **Append to file** are not selected if they are present.

Select the button on the far left for **File** (as shown). Make sure the caret is in the bottom middle icon (the one with 'null:' in).

Delete the text already in the icon, and enter ArcFax:ArcFaxTmp.Fax

```
◈ File   │  ArcFax:ArcFaxTmp.Fax│  ⇨
```

The icon should now look like this.

Finally click on OK the corner of the dialogue box.

Close the printer control window. Pop up the icon bar menu and click on Save Choices.

You should now have an ArcFax icon on the left of the icon bar. If you already had another printer installed in Printers this will also appear.

The currently active printer will be highlighted, and the others greyed out. You can switch between them by clicking with Select on the icon for the printer you want to use.

So before sending a fax you click on the ArcFax icon and before printing something to your printer, you click on the printer icon.

Printer Configuration

It is possible to use the printer driver to choose the quality of the faxes printed out, just as with normal printer drivers you can choose between high quality NLQ text or low quality draft text, or different resolution graphics dumps.

RISC OS 2 Configuration

Click on the icon bar printer icon. This window will open;

```
┌────────────────────────────────────────────────────┐
│ ▣ ⊠ │        Dot matrix printer driver             │
├────────────────────────────────────────────────────┤
│ Printer:  │          ArcFax (High)          │      │
│ ▣Monochrome graphics              204 by 196 dpi   │
│ Paper feed:    ◈auto feed ◇manual feed             │
│ ------------- Text printing options -------------  │
│ □Title     □Number lines      ▣Print line feeds    │
│ Print quality: ◇draft      ◈NLQ                    │
│ Control codes: ◈standard ◇display   ◇ignore        │
└────────────────────────────────────────────────────┘
```
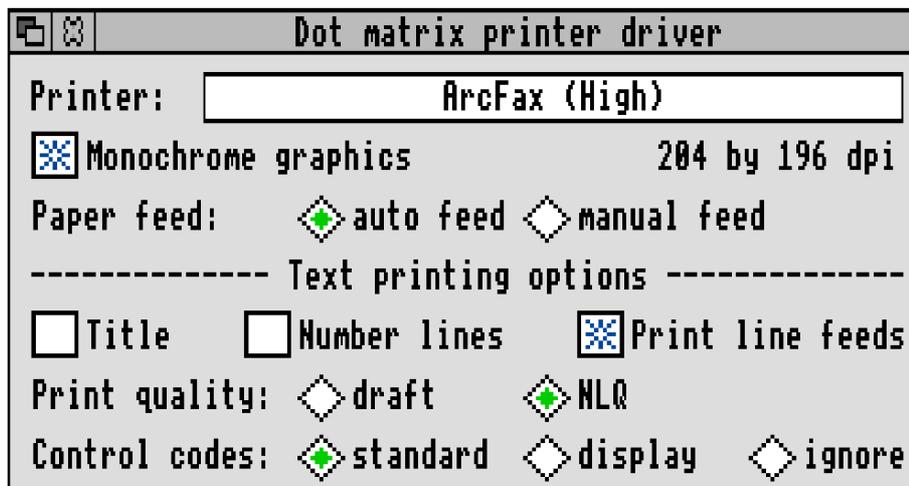
Clicking on the icon next to 'Printer:' can be used to choose between high and low resolution for graphics printing. The icons next to Print quality are used to choose between high and low resolution for direct text printing. NLQ corresponds to high resolution and draft to low resolution.

RISC OS 3 Configuration

To configure the ArcFax printer driver, choose 'Printer control...' from the icon bar menu. Press the menu button over the line in the printer control window for ArcFax and choose 'Configure...' from the menu. The 'Bit image printer configuration' window will open. The icon 'Resolution' can be used to choose between high and low resolution for graphics printing. The icon 'Text Quality' is used to choose between high and low resolution for direct text printing. NLQ corresponds to high resolution and anything else to low resolution.

3. Sending A Fax

This is the procedure to follow when you want to send a fax.

First make sure your fax modem is connected and switched on.

Quit or make inactive any other programs that use the serial port.

Run ArcFax.

RISC OS 3 users should run Printers and make ArcFax the current printer driver. RISC OS 2 users should run PrinterAF.

Now use the application you want to send your fax from. For example, type a letter in Ovation. When you are happy with it, print it. Printing will take place as normal. When printing finishes the newfax window will open.

Type the telephone number you want the fax sending to, into the lower icon. If ArcFax is active sending will commence as soon as you click on OK, or press RETURN. If ArcFax is greyed out on the icon bar, click with adjust to make it active.

The ArcFax icon on the icon bar will flash TX during transmission.

If the fax is not sent at the first attempt, ArcFax will make a number of attempts. The number of attempts and the time between them can be set (see Chapter 9 - Configuration).

It is also possible to type in a name from the Telephone Directory (see Chapter 5), or to click on the menu icon to the right of the **Send to** icon, and get a menu of destinations.

If **OK** is clicked on without a number being entered, the fax will be put in the TX Batch, and can be sent later, possibly to more than one destination by using its schedule window (see Chapter 6).

If **Discard** is clicked on, the fax will be deleted from disc.

It is possible to put the caret in the upper icon, either by clicking, or by using the cursor keys. You may then type in any name you want for the fax, instead of the automatically generated name.

The lower group of icons allow you to set various options for the fax. **Priority** sets how important the fax is. If it is Urgent it will be sent immediately, lesser priorities will of course take longer, but may use cheaper phone rates. **Call band** sets the phone charge band for the destination of the fax. Finally **Prefix** sets if the dial prefix will be used. Usually the prefix is used to send faxes via phone companies like Mercury. You won't want to do this on local calls, but will on long distance ones. The **Prefix** button lets you choose.

This group of icons will be filled in from values held in the telephone directory as soon as a name that appears in it, is entered. Alternatively the default values can be set from the New Fax configuration window (see Chapter 9).

Direct Send

It may be that you want to start sending a fax in the middle of a voice phone call. For example if you are sending a fax to a fax machine that shares a voice number. In the early days of fax it was common for fax machines to be manually operated. To do this you need to use the ArcFax control panel see Chapter 10.

Embedded Commands

It is possible to send faxes without going through the New Fax window, or the TX Batch window. To do this you must make use of an embedded command. This is a string that you enter into the document to be faxed. When the document is printed, ArcFax will intercept the command. The embedded commands are of the form;

{FaxTo:<string>}
{FaxName:<string>}
{FaxAfter:<string>}
{FaxPriority:<string>}
{FaxPrefix:<string>}
{FaxBand:<string>}

{FaxTo:} is used to give either the number or phone directory name that you want the fax sending to. So for example if you want to fax a letter to someone whose fax machine is on 123456789, all you have to do, is type the fax in your usual word processor, and include somewhere the text {FaxTo:123456789}, as soon as you print the fax, it will automatically be sent.

{FaxName: } is used to give a name to the fax that is created. e.g.
{FaxName: MyFax}

{FaxAfter: } is used to set a 'send after time' for the fax e.g. {FaxAfter: 18:00}.
The time should be in the form HH:MM:SS DD/MM/YY, the time of day or
date may be omitted. Notice this gives you an easy way to ensure that faxes
will always be sent after (for example) 6pm - you may want to do this to save
money by using cheaper phone rates. There are other ways of achieving this
effect - see the section of Chapter 9 on the New Fax configuration window,
and the Priority section of Chapter 6.

{FaxPriority: } Sets the priority for the fax e.g. {FaxPriority: Urgent}. See
Chapter 6 for the possible priorities.

{FaxPrefix: } Sets if the dial prefix will be used e.g. {FaxPrefix: Yes}. The
parameter should be "Yes" or "No".

{FaxBand: } Sets the call charge band for the fax e.g. {FaxBand: L}. The
possible bands depend on how your copy of ArcFax is configured, but they
are the same as available in the Telephone Directory.

Obviously it would be unsightly to have all these commands appearing in
whatever you want to fax. Most word processors or DTP programs will
provide you with tricks that you can use to hide such commands, like using
white text on a white background, or hiding them behind a frame.

Most people will only want to use the FaxTo command, all the others are
optional.

Embedded commands may be useful when doing a "mail-merge" operation
from a database. In that context they provide a simple way of using phone
numbers from your database to send faxes.

Scanning a fax

As an alternative to printing what you want to fax, you can scan it, just like
with a traditional fax machine. ArcFax uses the TWAIN interface to control
scanners. The sub-menu accessible from the icon bar menu entry 'Scan'
contains the two standard TWAIN choices of **Select Source...** and
Acquire...

You should select the data source with the first option, and then use
Acquire to scan the fax. Select black and white, and 200 dpi from the
source dialogue box. Once scanning is complete, you will get the usual new
fax window.

4. Receiving A Fax

This is the procedure to follow when you want to receive a fax.

First make sure your fax modem is connected and switched on.

Quit or make inactive any other programs that use the serial port.

Run ArcFax.

If ArcFax is not active (the icon bar icon is greyed out) click on it with adjust.

When the remote fax machine dials your telephone number ArcFax will answer and receive the fax.

The ArcFax icon on the icon bar will flash RX during reception.

Selecting RX Batch from the icon bar menu, will open a window showing all the received files. Files you have not looked at will have the word 'New' next to them. You can view received faxes by double clicking on the fax with the Select button in the batch window. Doing this will open a window on the fax, you can step through the pages by using the arrows attached to the left hand edge of the viewing window.

Whilst ArcFax is in this state, it will answer and treat all incoming calls as faxes. If you have a suitable modem, you can set ArcFax to only answer incoming calls that really are faxes, or to answer voice calls and act as an answering machine. Perhaps just as important, you can set ArcFax not to answer any incoming calls. The problem is if you are using a modem on your usual voice line, then after sending a fax, it is all to easy to leave ArcFax ready to spring into action and greet voice callers with Fax calling tones. See Chapter 9 on modem configuration.

Direct Reception

It may be that you want to start receiving a fax in the middle of a voice phone call. For example if you pick up the phone and find a fax machine at the other end. To do this, you need to use the ArcFax control panel, see Chapter 10.

5. Telephone Directory

The reason for the existence of the telephone directory, is that names are easier to remember than numbers. The telephone directory, allows you to enter names instead of numbers when you want a fax to be sent to someone.

You open the telephone directory by clicking on the second entry on the icon bar menu. Initially a window like this will open;

```
┌──┬──┬─────────────────────────────┬──┐
│ ▣│ ⊗│       Number directory      │ ▣│
├──┴──┴─────────────────────────────┼──┤
│                                   │ ⇧│
│                                   ├──┤
│                                   │ ▢│
│                                   │  │
│                                   ├──┤
│                                   │ ⇩│
│                                   ├──┤
│                                   │ ▣│
└───────────────────────────────────┴──┘
```

```
┌─────────────────────────┐
│        Directory         │
├─────────────────────────┤
│ Edit 'Acorn'             │
│ Del. 'Acorn'             │
│ - - - - - - - - - - - - -│
│ New entry                │
│ New group             ⇨ │
│ Sort                     │
│ Search                ⇨ │
│ Select all               │
│ Clear selection          │
│ - - - - - - - - - - - - -│
│ Password              ⇨ │
│✓Dial prefix           ⇨ │
│ Export                ⇨ │
└─────────────────────────┘
```
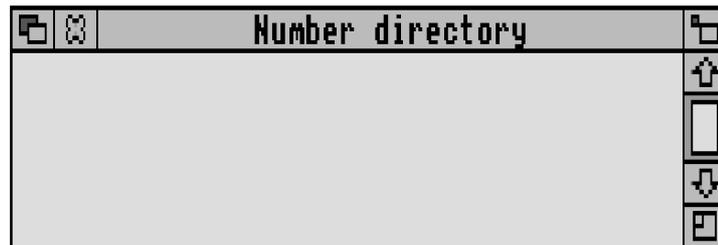
To add entries to the directory, press the menu button over the window. The directory menu will appear;

Choosing **New entry** from this menu will open the standard directory entry window. You can type in the name and number of one of the people you often send faxes to.

After doing this, the name number pair will appear in the number directory window. You can select one or more of these pairs using the Select and Adjust mouse buttons.

The Directory menu can then be used to manipulate the selected entries.

The first menu selection **Edit** opens the directory entry window for a single selected entry. This lets you change the settings for the entry.

The second choice allows entries to be deleted from the the directory.

The next choice **New entry** allows new entries to be added to the directory.

It is possible to form a number of entries into a 'group'. If instead of typing in an entry name when sending a fax, you type a group name, the fax will be sent to all the entries which are in that group.

To make a group, you select all the entries you want to be in it, pop up the menu and follow the line **New group** to the right and type in the name of the

group in the attached sub menu. In the main Number directory window, groups will have the word 'Group' displayed instead of a telephone number.

Sort will sort all the entries in the directory into alphabetical order.

Search will try to find the directory entry you type into the associated sub menu.

Clear selection clears all the selected entries in the directory and **Select All** selects all directory entries.

It is possible to prevent access to the phone directory, or particular numbers until a password has been entered. To do this the password is typed into the sub menu to the right of **Password**.

The next entry on the menu, is concerned with number prefixes. The sub menu allows you to enter a prefix string, whilst the tick to the left shows if the prefix will be used. It can be toggled on and off by clicking on it.

The normal use of this, is to insert your Mercury number and pin. You can then choose to dial certain entries via Mercury or via BT. For a Mercury user, the typical contents are; 131,123456,1234 Here 131 is the Mercury access number, 123456 is the user number and 1234 the pin. The commas insert pauses.

After the directory has been modified it will be automatically updated and saved to disc, either when the directory window is closed, or ArcFax is quit.

The final entry on the directory menu is **Export**. This leads to a standard save box, which lets you save the telephone directory as a CSV (comma separated value) file. Similarly you can import data in CSV format by dropping the CSV file into the directory window. The typical use for this feature, is if you already have a collection of names and phone numbers, you can then use your database program or whatever to produce a CSV file that can be loaded by ArcFax. Probably the best idea is to study a saved CSV file to work out the format that you will need to export from your other program. Some of the entries which are controlled by on off switches require a single token or word in the CSV file e.g. Prefix.

Double clicking with Adjust on one of the entries in the directory will allow it to be edited. This can also be achieved by choosing **Edit** from the directory menu, and the same window will appear when **New entry** is chosen. There are two different edit windows, depending on whether single entry or a group is being edited. First consider editing a single entry. The next window will appear.

The first writable icon is used for the name of the entry.

The next icon is for the Fax number.

The other writable fields are optional and should be obvious.

The two Dial buttons to the left of the Fax and Voice numbers will make your modem voice dial the number. This is only suitable for use with touch tone phone systems, however it will work with most modems - not just voice modems. You should pick up the phone and then click on the button.

At the side of the window, are some buttons that can be toggled.

Prefix - if this is checked the dial prefix will be used when dialling the entry. Typically you don't use the Mercury prefix for dialling local numbers.

Show on menu - when this is selected the entry will appear on the menus used for adding numbers to faxes. Usually you only want frequently used entries on the menus.

No password - when this is selected it is not necessary to enter a password before dialling the number. This only applies if a password is actually defined.

Bar - when this is selected, if caller id works on your phone system and modem, then calls coming from the number assigned to the directory entry will be ignored. In other words, the caller will be barred from your system.

Block - similar to Bar, however this works on the fax id, that fax machines send. The effect is that the incoming call will be answered, then if the caller is blocked the line will be dropped. Use this to defeat junk fax.

Check - This option will check that the identifier of the machine answering is the same as that given in the directory entry. This is intended as a security feature - only the intended fax machine is able to receive the fax.

As well as the usual **Cancel** and **OK** buttons, the **More** button will take you to a further screen of more advanced directory entry options.

```
┌─────────────────────────────────────────────┐
│ ▣          Edit directory entry             │
│                                             │
│    Entry name │        Acorn         │      │
│      Priority │   Urgent    │  ⇨ │          │
│     Call band │    None     │  ⇨ │          │
│  Remote fax ID │            │        □       │
│       Receive  ⊠Fax   □Data   □Voice        │
│     Call mode ◇Answer      ◈Originate       │
│                                             │
│  ┌ Server ─────────────────────────┐        │
│  │ □Active                         │        │
│  │       Name │        │ ⇨ │       │        │
│  │   Option 1 │            │  ┌─────────┐   │
│  │   Option 2 │            │  │Previous...│ │
│  │                           └─────────┘   │
│  └────────────────────────┐ Cancel │  OK │ │
└─────────────────────────────────────────────┘
```

Priority lets you set the default priority that will be given to calls to this entry, by clicking on the right pointing arrow.

Similarly **Call Band** lets you set the call band for the entry. The call band is the cost your phone company charges for calls to the entry. Typical bands are "local" "a", "b" etc.

The **Fax**, **Data** and **Voice** buttons allow you to set what type of data you expect to receive from the destination if you make outgoing calls to it, to receive things. Note this is rather different to the usual process of making calls to send things.

Answer and **Originate**, control if the modem should make outgoing calls to the entry in originate or answer mode. Almost always the correct setting will be originate.

Remote ID, is an entry to type in the remote fax id of the entry. This is used with the blocking facility, and it will only be enabled when the option icon to the left is selected.

Server allows you to choose for all calls to the entry to be handled by a custom script program, rather than ArcFax. These options are described further in the Server section of Chapter 9, on configuration.

Finally the **Prev** button will take you back to the main entry configuration options.

If an entry in the main telephone directory window is double clicked with Select it's voice number will be voice dialled. This is a useful short-cut.

Entries can be dragged from the main telephone directory window. Possible destinations are group or schedule windows. If a drag ends on another program, the full name and address fields will be formed into a text file. This is a quick way of exporting names and addresses from the telephone directory and into your word processor etc.

Editing a Group
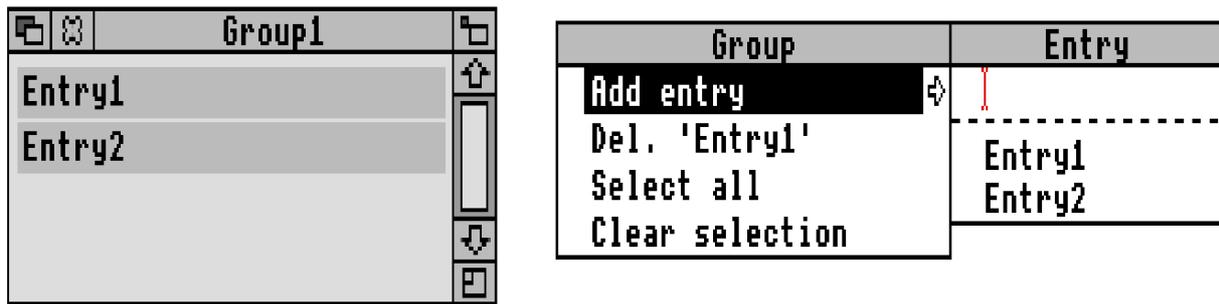
When a group is edited, a window will appear showing all the entries that form it. Pressing the menu button over it opens the menu structure shown on the right. The first choice leads to a submenu. This will show entries from the directory (those that had Show on menu checked). Entries can then be added to the group by clicking on them in the menu. Alternatively the first item on the menu is writable and you can type in the name of the entry to add.

It is also possible to add entries to a group, by dragging them from the telephone directory window and dropping them into the group window.

The next menu entry allows selected entries in the group to be deleted.

The last two menu entries allow all entries in the group to be selected or unselected.

6. Batch Windows

ArcFax has two "batches". These are pseudo-directories which are used for storing received faxes and faxes that have been prepared for transmission. They behave in a similar way to the windows used to display the contents of ordinary directories.

The "RX Batch" holds received faxes and the "TX Batch" faxes waiting to be sent. The batch windows can be displayed by using the icon bar menu.

```
┌──────────────────────────────────────────────────┐
│ ▣ ☒ │        〈ArcFax$RXBatch〉              │ ▯ │
├──────────────────────────────────────────────────┤
│ 🖼Fax002      TIFF        54K Rcvd   21:23:50 Fri 28 Aug 92  ⬆ │
│                                                          ▢ │
│                                                          ⬇ │
│                                                          ▣ │
└──────────────────────────────────────────────────┘
```

This is a typical batch window. It shows that faxes are stored as TIFF files, then the file length. If a fax has been received but you've not looked at it yet the next field will say 'New' once you've seen the fax it will (as shown) display 'Rcvd'. The final field is the date and time the fax was created at.

For the TX batch, the New/Rcvd field will either display 'New' if the Fax is not scheduled to be sent to anyone, 'Sent' when it has been successfully sent to all the people it should be or something like '(3/8)' this means that it is to be sent to 8 people and has successfully been sent to 3 of them.

```
┌──────────────────────┐
│        Batch         │
├──────────────────────┤
│ Display            ⇨ │
│ Fax 'Fax020'       ⇨ │
│ Select all           │
│ Clear selection      │
│ Open directory       │
└──────────────────────┘
```

Faxes in the batch windows can be selected with Select and Adjust in the usual way and a menu can be displayed by clicking with the Menu button.

The first entry **Display** allows you to choose the form the batch will be displayed in and whether the faxes are sorted by name or time stamp. These options are identical to those for normal disc windows.

```
┌──────────────────────┐
│         File         │
├──────────────────────┤
│ Info               ⇨ │
│ Delete               │
│ Rename             ⇨ │
│ Merge              ⇨ │
│ Print                │
│ View...              │
│ Schedule...          │
│ Add entry          ⇨ │
│ Entries            ⇨ │
└──────────────────────┘
```

Select all and **Clear selection** allow all the faxes in the batch to be either selected or unselected. **Open directory** lets you access the real disc directory where your faxes are stored.

When one or more faxes are selected, the second entry on the main menu will lead to this submenu.

Delete deletes the selected faxes in the batch window.

Rename can be used to change the name of a fax. This is useful because faxes will initially have automatically generated names.

If more than one fax is selected in the batch, **Merge** will let you produce a new fax consisting of all the pages of the selected faxes. Please note that merging will take place in alphabetical order. You may have to rename some faxes to get the ordering you want e.g. PartA, PartB.

Print will immediately print the fax on your printer.

The next two entries, let you **View** or look at faxes and open the **Schedule** window for the fax. These two options are equivalent to double clicking with Select or Adjust on an entry in the batch window.

The last two entries, **Add entry** and **Entries** are short cuts, allowing you direct access to the schedule for the fax. They correspond exactly to the same two entries on the fax schedule menu. Fax schedules are described in Chapter 8 - they control who a fax is sent to and when. Add entry allows you to add more names or numbers for the fax to be sent to. Entry lets you modify the fax. It acts as if all the entries in the schedule were selected - so you can rapidly delete all the schedule entries.

For voice and data files there are obvious extensions and limitations on the menu. You can't print voice message files, but instead of viewing them ArcFax will attempt to play them back.

Finally **Info** opens a small window displaying information about the fax, what its resolution is, how many pages it contains and so on.

For long term storage you can drag files from the batch window and into normal disc windows.

Similarly you can drag files that you have previously removed from the batch windows and drop them back into a batch. You can also drag files from the RX to the TX batch. This might be useful if you want to forward a received fax to someone else.

As usual holding down SHIFT will move a file rather than copying it.

Faxes stored in TIFF files are compressed using the same algorithms as are used when they are transmitted - 'CCITT3' (also called 1 dimensional coding) or 'CCITT4' (2 dimensional coding) . These are only two of a number of compression algorithms that can be applied to images in TIFF files. Unfortunately, they are not the ones most commonly implemented by image processing software.

Fax files saved anywhere on disc can be viewed by dropping them on the ArcFax icon bar icon. ArcFax will not attempt to load TIFF files that are

double clicked on the desktop. This is because you are likely to have general purpose image processing programs like 'ImageMaster' which will make a better effort at displaying random TIFF files. ArcFax can only display TIFF's with CCITT3 and CCITT4 format images in.

Holding down SHIFT and double clicking on a fax in a batch window will produce the same effect as double clicking on a TIFF file in a normal disc window. This may be useful to load faxes into other programs.

Voice files behave like TIFF's you can drop them into batch windows, and play them back either by dropping them on the icon bar icon, or double clicking on them in a batch window.

The data in voice files will be saved using the type of data compression that your modem uses. It is unlikely that you will find a program that can understand such data.

Files in general, can be dropped into batches, and saved from them by dragging.

7. Viewing A Fax

When you double click in a batch window with Select, or choose View... from the batch sub menu, a window will open displaying the fax.
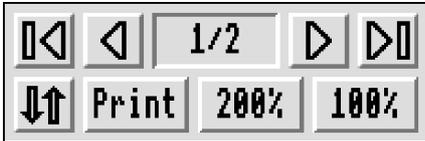
A tool box pane to the left of the window has several buttons on it. The arrows can be used to step backwards and forward through the pages in the fax. The arrows with bars, will jump to the first and last page in the fax. Between the arrows, a number shows the current page number and the total number of pages in fax.

The icon with an arrow pointing up and one pointing down, can be used to flip a fax through 180 degrees. Useful if as often happens, the person sending you the fax, has put it in their fax machine upside down.

The **Print** icon, allows quick access to the fax printing facilities. The **100%** and **200%** icons let you change the magnification for the fax.

You can save pieces of the image in the window by clicking with Select and then dragging. A rotating drag box will appear around the area that is going to be saved.

When you stop dragging a standard save box will pop up. You can then save the area as a sprite file.
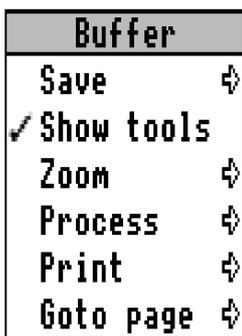
Pressing the menu button over the window, displays this menu. The first entry allows you to save the entire fax page as a sprite.

The second entry allows you to toggle the tools window on or off.

The last entry leads to a sub menu that will let you jump immediately to a given page in the fax.
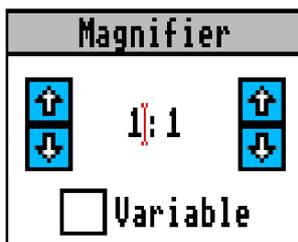
Zoom leads to a standard magnifier window. You use this to change the scale the fax page is displayed at on screen.

If **Variable** is checked, then the scale will depend on the size of the fax window.

Print fax

Printer | Canon LBP-8 300dpi

◈ All pages ◇ From 1 to 1

Copies 1

◈ Portrait ◇ Landscape

Scale X 100%   Scale Y 100%

Corner X 0mm   Corner Y 0mm

Set | Print
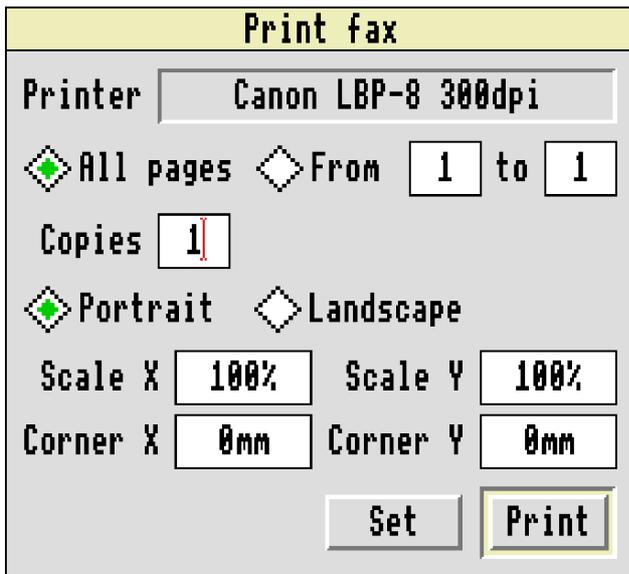
Print produces this window which lets you print the fax page. **Copies** is how many copies of the page will be printed. **Portrait** and **Landscape** control whether the fax will be printed upright or sideways on the paper. **Scale X** and **Y** scale the printed image. Finally **Corner X** and **Y** allow the fax to be shifted on the paper.

The **Print** button will start printing. The **Set** button will save the values in the window and close it without printing.

Finally on the view menu there is **Process**. This leads to a dialogue box that allows you to apply various types of image processing to faxes. For example you can rotate them, or change the screen mode used for them.

A normal A4 page will contain about 1700 by 2200 pixels. This occupies around 500K as a 2 colour mode sprite. The resolution is sufficient to give good detail however, it is too big to fit on screen easily. Using the Zoom feature you can change the magnification until the page does fit on screen, however much information will be lost so the fax will be hard to read. What would be nice, would be a way of scaling the sprite down whilst making it easier to read, 'Antialiasing' does just this. By simultaneously scaling the sprite and rendering it in several shades of grey, it is possible to get better apparent resolution whilst reducing the size of the sprite. The Process dialogue box controls all these features.

Process

☐ Mirror L/R   ☐ Mirror U/D

☐ Rotate ◈ +90 ◇ -90

204x98 mode 8 ◇ 1 ◈ 2 ◇ 4 ◇ 8

204x196 mode 26 ◇ 1 ◈ 2 ◇ 4 ◇ 8

Scale
X 1 : 2   ◇ 1:1 1:1 ◇ 1:1 1:2
Y 1 : 2   ◇ 1:2 1:1 ◈ 1:2 1:2

OK
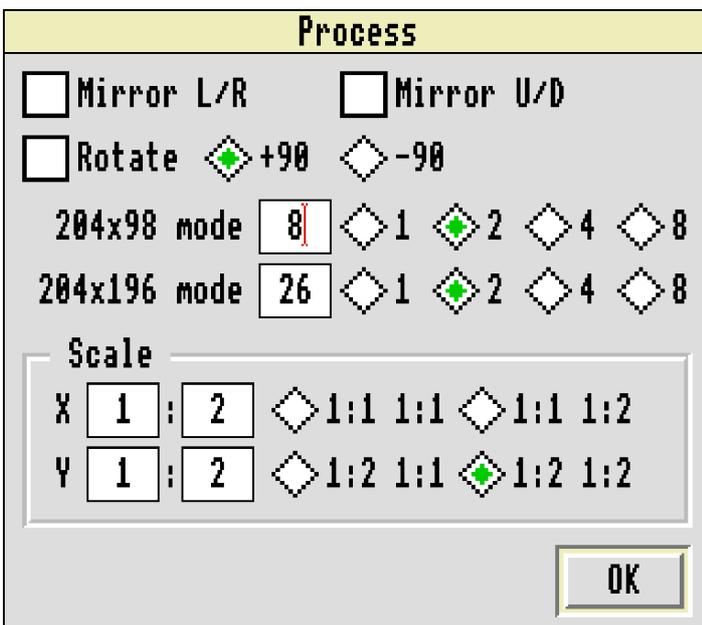
Mirror L/R will when checked reflect the fax in a line running from the top of the page to the bottom.

Mirror U/D similarly reflects the fax in a line running from left to right.

Rotate will flip the fax by either +90 or -90 degrees depending on if the **+90** or **–-90** icon is selected.

The two rows of **1 2 4 8** represent the number of bits per pixel in the 2, 4, 16 or 256 colour modes that can be used for display. There is one row for each of low and high resolution faxes. New modes can be typed in. Normally one would choose a mode with the same pixel aspect ratio as the fax. For example Mode 0 for low resolution faxes and Mode 25 for high resolution faxes.

The final group of icons sets the scaling applied to the fax. Scaling can be different in the X and Y directions. Notice the difference between scaling with this dialogue box and scaling with the magnifier. The magnifier just changes what is displayed on screen. Process actually creates a different sprite. For example using scaling of 1:2 for both X and Y will create a sprite 1/4 as large, assuming the same mode is used. However because it is smaller its resolution will necessarily be less.

For on-screen display, a good compromise is shown in the above picture. Scaling of 1:2 is used and reduces the sprite size to 1/4 (about 128K) but the sprite is rendered in a 4 colour mode (2 bits per pixel which brings the size up to 2x128K=256K). This allows 3 shades of grey to be used for antialiasing so on- screen resolution appears better.

After you change the options in the Process window, OK must be clicked on to redisplay the image using the new values.

If the detail in a fax was of particular interest, then you would probably use 1:1 scaling and display it in a 1 bit per pixel mode.

When you print faxes, all antialiasing will automatically be turned off, and the fax rendered at maximum resolution. This does mean that you must have about 500K of free memory to print a fax page.

8. Schedules

A schedule controls who a fax will be sent to, and when it will be sent. Only faxes in the TX Batch have schedules, you can display the schedule by double clicking with Adjust on a fax or by selecting it and choosing 'Schedule...' from the sub menu. Initially when a fax has been created, its schedule window will be empty. Usually there will be one line in the schedule window for each destination for the fax.

The first field shows who the fax is to be sent to. It may be a telephone directory name, or a telephone number.

The second field can show 'Finished' as above, if the fax has been successfully sent. Alternatively a number in brackets like this '(2)' shows how many attempts have been made to send it. If you have told ArcFax to only send the fax after a given date and time it will say 'After'. If a fax is temporarily being held the field will display the word 'Held'.

The final field, shows a time. What this time represents depends on the status of the fax. If it has been sent, it is the time the fax was sent at. If it is to be sent after a given time, then it is that time. Otherwise, it shows the time the last attempt to send the fax was made.

As usual, single or groups of entries in the schedule window can be selected using Select and Adjust and then the Menu button used to pop up a menu that can manipulate them.
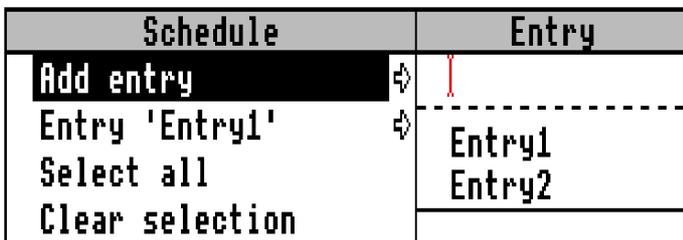
The first menu choice **Add entry** allows you to add more destinations for the fax. The attached sub menu will let you either type in a name or number, or pick from the telephone directory entries that have been set up to appear on the menu.

It is also possible to add entries to a schedule, by dragging them from the telephone directory window.

Select all and **Clear selection** on the menu just select and unselect all the destination lines in the schedule window.

```
┌─────────────┐
│    Entry    │
├─────────────┤
│  Delete     │
│  Finished   │
│  Start      │
│  After    ⇕ │
│  Hold       │
│  Release    │
│  Priority ⇕ │
│  Bits     ⇕ │
└─────────────┘
```

The **Entry** sub menu, allows you to manipulate the selected destinations in the schedule. **Delete** lets them be removed. **Finished** will force the state of the transmission to the destinations to sent or finished - no further attempts will be made to send, whilst **Start** forces it to be waiting to be sent. This provides a way of either stopping faxes from being sent or resending them. **Hold** and **Release** are a way of temporarily stopping a fax from being sent, and allowing sending to recommence.

In a perfect world there would be no need for **Hold** in reality things tend to go wrong, and by holding a fax you can prevent it being sent until you have sorted out your problems. There are a number of occasions on which faxes will be automatically set to hold. Firstly if you click on Cancel on the Control Panel when a fax send is going on, the current fax will be held. Secondly the Control Panel will let you click on a **Hold** button that puts all pending faxes on hold. Finally you can configure the program, so that when first run, if there are unsent faxes, you are given a chance to set them to hold. As you'd expect **Release** undoes the effect of hold, returning the transmission process to the previous state.

After leads to a standard time dialogue box.

```
┌─────────────────────── After ───────────────────────■□┐
│                                                        │
│        ⬇⬆   7:14pm   ⬇⬆              OK               │
│                                                        │
│  Sun ,27  ⬇⬆    February  ⬇⬆    1994  ⬇⬆             │
└────────────────────────────────────────────────────────┘
```
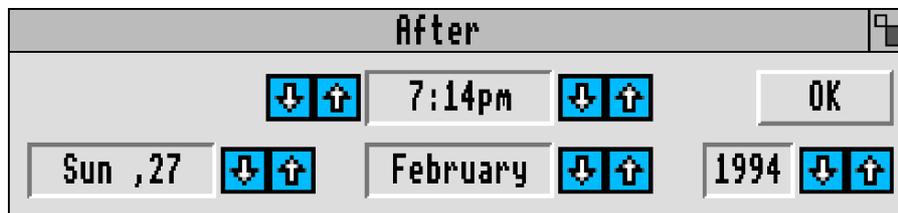
This is used to enter a time. Once **OK** is clicked on, the fax will be sent after that time. This is useful if you want a fax to be sent at night when phone calls are cheap, or if you want to make sure a fax is only sent after a given time/date. It is possible to get a schedule destination out of the After state by using Start from the Entry sub menu.

Clicking on the top right hand corner of the After window, reveals more options. These are concerned with making the After time repeat. You can choose the repetition to occur every so many minutes, hours, days or months. Multiple choice buttons allow the days on which the event occurs to be chosen. So by choosing a repetition of 1 day, and selecting the Monday to Friday buttons, you can make a schedule entry that occurs every weekday.

Now unless you are a sender of nuisance faxes, there's not much point in repeating fax transmissions. The utility of this feature is when the schedule is not for sending something, but for receiving. You might set up ArcFax to ring

the Met Office fax and pick up the weather forecast at 12 noon Monday to Friday. More details are given in Chapter 10 on the Control Panel.

```
┌─────────────────┐
│    Priority     │
│ ✓ Urgent        │
│   Important      │
│   Standard       │
│   Offpeak        │
│   Economy        │
│   Cheap          │
│ ─ ─ ─ ─ ─ ─ ─ ─ │
│   Overnight      │
└─────────────────┘
```

Priority leads to a menu allowing you to set the priority for the fax.

The various priorities have special meanings, although obviously they grade from "panic!" to "fax and forget".

Urgent means the fax will be sent immediately, it will also rise to the top of the send queue - beating any other faxes which are not declared urgent.

Important means that the fax will be sent immediately, however urgent faxes will take priority.

Standard, Offpeak, Economy and **Cheap**, are related to phone time costs. If you declare a fax as Offpeak, it will only be sent when a cheap enough phone time rate is available. Ideally you would set Standard to be after 1pm, Offpeak to be after 6pm, and Economy perhaps for the weekend. Correct operation of this feature depends on having the charge call band file set up properly. See Appendix 1.

Overnight is slightly different. You can use the New Fax configuration window to set up the meaning of overnight. Faxes given an overnight priority will then be sent between the hours specified. This can be looked upon as a simple form of the usual priority system, but for people who can't be bothered to set up the call bands file.

Finally, bear in mind that you can ignore all this stuff. Just set everything to Urgent - and ArcFax will work perfectly. In fact by default ArcFax will set Urgent so you need do nothing.

```
┌─────────────────┐
│      Bits       │
│    Prefix       │
│ ─ ─ ─ ─ ─ ─ ─ ─ │
│    Voice        │
│ ✓ Fax           │
│    Data         │
│ ─ ─ ─ ─ ─ ─ ─ ─ │
│ ✓ Originate     │
│    Answer       │
│ ─ ─ ─ ─ ─ ─ ─ ─ │
│   Call band ⇨   │
└─────────────────┘
```

The final item on the entry menu is **Bits**. This shows a miscellany of bits of information attached to the schedule entry. In general you do not need to use this menu. It is provided for completeness, and for expert users.

Prefix controls if the dial prefix will be used.

The group **Voice, Fax** and **Data** show what type of call is to be attempted.

Originate and Answer show if the modem will make a call in answer or originate mode.

Finally **Call band** points to the usual call charge band menu.

9. Configuration

Introduction

The configuration window, is opened from the icon bar menu. It allows you to tune ArcFax to your particular modem and tastes. As a short cut, you can open it by clicking on the icon bar icon with Adjust, whilst pressing SHIFT.

The window that opens, has a number of icons in it. One icon for each of the sub configuration windows. Ideally these split up the configuration into related and simple sections.

The sections are
Modem - concerned with choosing modem drivers. Look at this first.
Batch - options concerned with the TX and RX batches
Printer - deals with printer output from ArcFax, and some aspects of the ArcFax printer driver.
Fax - what sort of faxes you send.
Voice - settings to do with voice modems.
Server - advanced setup for receiving incoming calls.
NewFax - attributes e.g. priority, applied to the schedules of new faxes.

Finally the Save button allows you to save your ArcFax configuration, so that the next time the program is run, the configuration will be the same.

Looking at the sections of the configuration window in turn.

Modem

Driver displays which modem driver is loaded. A menu showing all the available modem drivers can be popped up by clicking on the arrow to the right. You should choose the correct driver for your modem. The generic drivers are Class 1, Class 2 and Class 8. These are written to work with as many modems as possible. Other drivers for specific brands of modem are supplied, these should be used with care - just because there's a 'SnibboFax' driver does not mean that it works with your particular 'SnibboFax' modem - most manufacturers early efforts at Fax modems had bugs in. See the file !Modems on the ArcFax disc for more information.
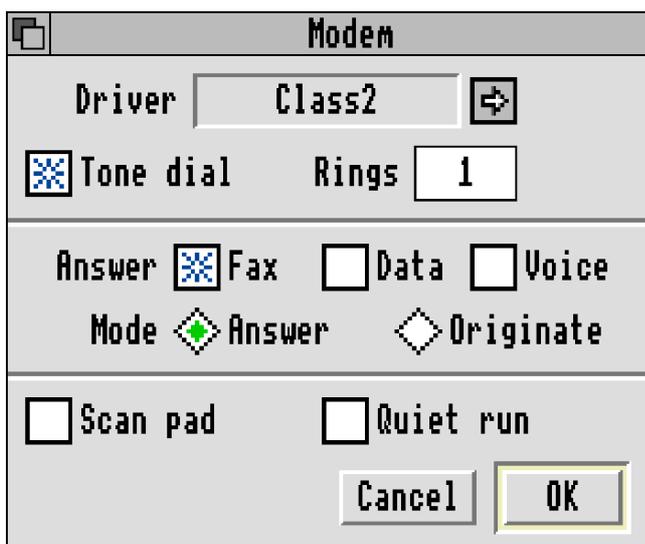
Rings is an icon in which the number of rings you want ArcFax to answer incoming calls after is entered. If your phone system and modem support caller id, you may need to set Rings to be 2 or 3 to give the caller id chance to appear. The same point might apply to auto detecting incoming fax calls.

Tone dial sets if Touch Tones will be used to dial.

Scan pad controls if ArcFax will attempt to pad fax data with zeros. In theory this should not be needed, in practice many modems have bugs in which make padding necessary. Leaving this selected does no harm, and has no cost, however deselecting it allows ArcFax to operate without sending as much data through the serial port.

The three buttons **Voice, Fax** and **Data** are most important. Any combination including none may be selected. These buttons control what sort of incoming calls your modem will answer. Often you may want your modem to send faxes, but to ignore all incoming calls - in which case, you have none of the buttons selected. Perhaps you want your modem to pick up fax calls whilst you are at your desk, and voice calls when you leave it. In that case you would have fax selected all the time, and voice just when you are out.

Such clever operations depend on your modem being able to sort out the various types of call. A full spec. Class 8 modem should handle all combinations, on the other hand, many Class 1 modems can only receive fax or data, and cannot detect the difference.

There is another benefit of having ArcFax configured with none of the **Fax, Voice** or **Data** buttons selected, this is that in such a state, it does not need to keep the serial port active. Since battery operated modems usually only switch on when the serial port is active, this configuration can help conserve the batteries.

The **Answer** and **Originate** buttons set which mode the modem will answer incoming calls in. Almost always the correct setting will be **Answer**

Quiet Run - if this is selected, then when ArcFax is run, it will not attempt to grab the serial port, instead it will remain in the quiescent state, until toggled out of it by clicking on the icon bar icon with Adjust. A similar effect can be obtained by holding down ALT whilst running ArcFax, or by adding -quiet to any command line ArcFax is run from.

Batch

This group of icons control operation of the batches. When **Discard** is checked any damaged faxes that are received will be discarded. **Auto Del.** will cause faxes to be deleted from the TX batch as they are sent.

Delay is a writable icon which allows you to enter the time delay (in seconds) between successive attempts to send a fax. In other words if the receiver is busy how long will elapse before ArcFax redials. Attempts similarly controls the maximum number of attempts that will be made.

RX Popup - this will make the batch window appear on screen as soon as a fax is received.

TX Popup - this controls if the TX batch or New fax window will appear when a fax enters the TX Batch. If you are producing a number of faxes for later use, you may not want the New Fax window to keep appearing. You can always use the schedule window to add destinations for faxes.

Unsent - if this is selected and there are unsent faxes when ArcFax is started, you will be warned and given the chance to hold them.

Log controls the ArcFax log file. When this is active, a text file will be generated showing the numbers ArcFax has called, whether the call was successful and which faxes were sent. The path to be used for saving this file can be typed in, or by clicking on the right arrow a save box can be displayed and dragged to the desired destination.

Forward - you can enter here, in one of the usual ways, a name or number that you want incoming faxes to be sent on to. If a fax is received, a copy will be put in the TX batch with the forward destination automatically set up.

Printer
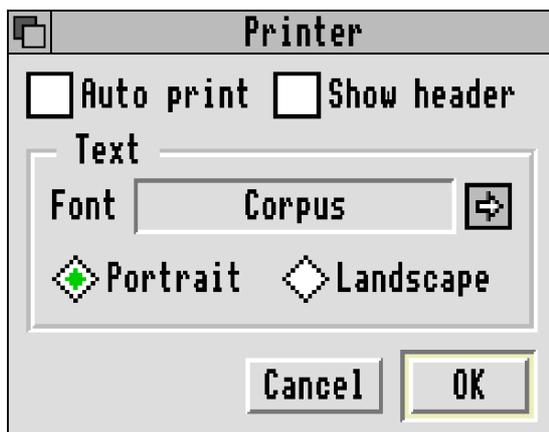
Auto print
Makes all incoming faxes be printed on your printer as soon as they arrive.

Show header
This will print on faxes information concerning time of arrival, and the identifier of the remote fax machine.

Text
Under RISC OS printer output can take two forms. Graphics is what is used by DTP programs etc. Text is the sort of output you get on dot matrix printers using their built in fonts. ArcFax emulates this latter mode. You can choose the outline font that will be used, and whether text will be printed upright on the page (Portrait), or as two side by side pages per sheet of A4 (Landscape). Text printing effects like Bold and Italics will be emulated by choosing the correct font variation. For example if the chosen font is Corpus (a good choice since text output is usually monospaced) Corpus.Bold and Corpus.Bold.Oblique will be used.

Fax

```
┌─────────────────────────────────────┐
│ ▣          Fax                       │
├─────────────────────────────────────┤
│  Header  │ ▌ArcFax        │  ▣       │
│  Ident   │   0123456789   │  ▣       │
│  Errors  │ 5% │  Retries │ 10 │       │
│  Min rate │   2400   │ ⇨            │
│  Max rate │   9600   │ ⇨            │
│  Width   │   1728   │ ⇨             │
│  Length  │ A4 297mm │ ⇨             │
│  Options  ▣ Fine   □ 2D coding       │
│                  Cancel    OK        │
└─────────────────────────────────────┘
```

These options control the fax modem and the sending and receiving process. They determine the appearance your modem presents to other fax machines.

2D (Dimensional)

This has two uses. When selected, CCITT two dimensional coding (similar to the coding in Fax Group 4) will be used for storing faxes in TIFF files. This can give impressive results. Faxes will only take up 50% of the space when stored with standard 1D coding.

Also when this option is ticked, the modem drivers may attempt to use 2D coding for fax sending and receiving. Because of the possibility of errors (which means some 1D coded lines still have to be used), 2D coding is not as good as when used on fax files, but still gives a worthwhile improvement. The fax machine used at the other end, must also support 2D coding. Using 2D code will save you money.

Fine

Sets whether you are able to receive high resolution faxes or want other fax machines to send them only at low resolution.

Max Rate

This is the maximum rate used for transmission. The arrow to the right allows you to open a menu that can be used to change this. Standard modems should have this set to 9600, newer faster ones to 14,400.

Min Rate

This is the minimum speed used for transmission by you. When a fax transmission is negotiated, the modems test the line to see the highest speed which will allow data to be sent reliably. On a bad line, this speed can turn out to be quite low e.g. 2400bps. If you are sending a fax over an expensive route, it can often be better to end the call and have another try. Often redialling will obtain a better line and permit a higher transmission speed. So if the negotiated rate is less that the minimum set, ArcFax will terminate the call, and the auto retry feature will then send the fax again.

Width

This is the maximum width of faxes. Again a menu can be used to choose from the standard values.

Length
Does the same for the height of the fax page.

Ident
When fax machines communicate they can exchange two 20 byte strings. Normally these identifiers are set to the fax machine phone number. This entry allows you to program your identifier string and control if it will be sent. Please note that the strings should be composed of the digits 0 to 9, space and - . Many Fax systems will allow alphanumeric strings, however some modems will reject them and some fax machines not print them. An identifier like "Snibbo Corp" is both cute and informative - but may not be practical.

Errors
This is the percentage of bad lines per page before the modem driver is told that the page was bad.

Retries
This is the number of times a page should be repeated if it is bad.

Header
When selected the text here will be printed at the top of each transmitted fax, with the time/date the fax is sent, the page number and number of pages.

Voice

This window will only be available if you have selected a Voice modem driver.

Compression
The first icon displays the type of data compression to be used. The arrow to the right allows you to pop up a menu of the available alternatives. These will vary from one modem to another.

Bits per sample
Controls how many bits will be used for each sound sample.

Samples per second
Set the rate of sampling.

Silence detect
How long in seconds a pause has to be for the modem to stop recording voice calls.

Max message time
This is the maximum time allowed for callers to the answering machine facility to give their message. If you feel that answering machines don't make people feel uncomfortable enough already, you can tell callers they have precisely 10 seconds in which to speak their message.

Server

In ArcFax the term "server" means a script file that is given control at the moment that the modem has connected to a remote caller, and determined it's type - Voice, Fax or Data. If no server is specified ArcFax will just carry out its default operation, perhaps to act as an answering machine, receive a fax, or receive some files. Otherwise the server script will gain control. Such scripts have three parameters passed to their main() function, first the type of connection - Voice, Fax, Data and then two string parameters.

Servers have enormous potential. You could have one that provided voice mail boxes. Or a business could have one that asked callers if they wished to talk to a person, leave a message, or request information to be faxed to them. Obviously servers can be constructed from script file function calls by hand. However what would be best would be a tool that allowed such scripts to be constructed in a graphical way.

The Server configuration window, allows you to specify if a server should gain control of incoming calls (active), set its name, and enter the two string parameters it will be given when it starts.

New Fax

This dialogue box, lets you set the options that will be applied to new faxes. Normally these options can also be supplied from the phone directory. So the values set in this window, will apply to just numbers you enter, and not to Telephone directory names. However the first option **Override** does make the values apply to all destinations, both names and numbers.

Prefix, Priority and **Call band** are just the same as for Telephone directory entries.

The other purpose of this window, is to allow you to set the times for the "Overnight" priority. These are the times between which faxes given a priority of overnight will be sent.

10. The Control Panel

Introduction

Clicking on the ArcFax icon bar icon with Select, will produce the control panel. Akin to the control panel on a real fax machine, it shows you what ArcFax is doing, and allows manual control of fax sending and receiving.
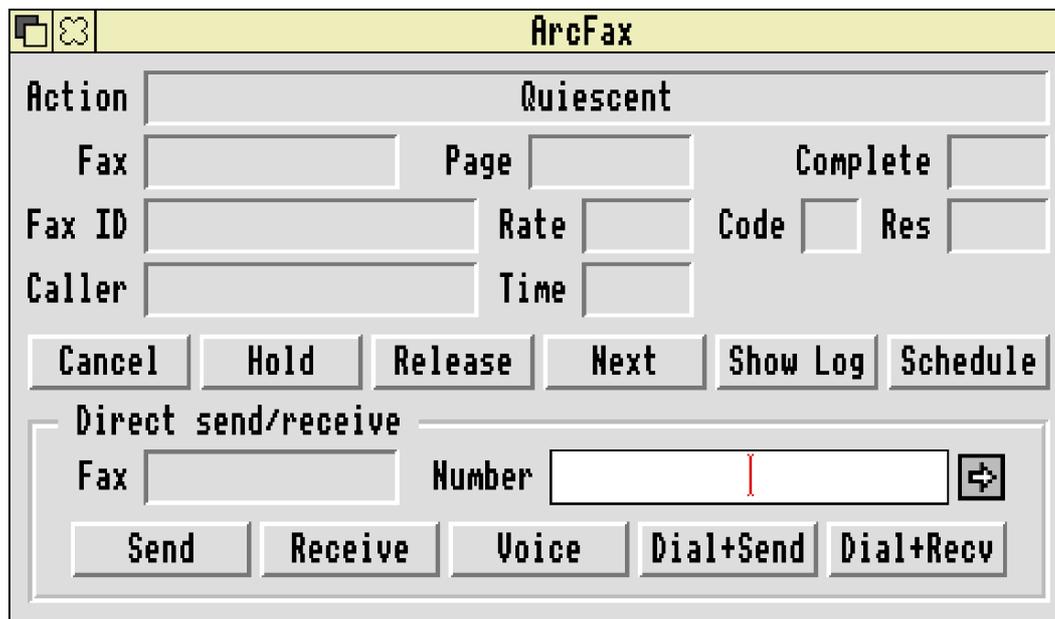
The icons in the top half of the window, give status information.

Action will show 'Quiescent' if ArcFax is not doing anything, and does not have control of the serial port. It will show 'Waiting for incoming call' if ArcFax has control of the serial port, and will answer the phone line.

Fax displays the name of a fax being sent or received.

Page shows the current page number being sent, and the total number of pages in the fax.

Complete gives the percentage of the fax that has been sent to the modem. Please note that modems and your computer buffer data, because 100% of the fax has left ArcFax it does not follow that 100% of it has arrived at the remote fax machine.

Fax id is the identifier string of the remote fax machine. Usually its phone number.

Rate is the speed of fax transmission in bits per second. Usually 9600.

Code is the type of data compression either 1D(imensional) or 2 D(imensional).

Resolution shows if the fax is being sent in High (Fine) or Low resolution. It is possible for the remote fax machine to override the resolution that you have printed the fax in.

Caller. Will show the Caller id of the remote phone line for incoming calls. This must be supported by your modem and phone company.

Time. Gives a running clock showing the duration of the call in seconds.

Direct send/receive

This is a group of icons concerned with directly sending and receiving faxes. Traditionally, fax machines shared voice phone lines, and to send a fax, you made voice contact with the remote fax machine operator, both persons would at the appropriate time press buttons on their machines, and replace the telephone handsets. Now such procedures are rare, unfortunately though the need can still arise from time to time.

Send
To use this, you must drag a fax from the TX batch, and drop it into the Fax icon (nb. the one in the direct send group). Now make voice contact with the remote fax machine, at the crucial moment, click on Send, and ArcFax will attempt a direct send of the fax.

Receive
This is slightly simpler than Send, all you have to do, is click on the icon when the remote fax machine starts to send its fax.

Dial+Send and Dial+Receive
A slight variation on direct send and receive is for the modem to dial and then attempt the operation. A common requirement, is to dial a number, and then attempt to receive a fax - as opposed to the usual procedure of dialling and then sending. Typically you do this if you are trying to get a fax from a fax server system - for example some companies distribute their price lists this way, the Met Office sell their data using this sort of system.

To do this, you must enter the number to dial in one of the usual ways, name or number, or choice from the menu. For sending, you must have loaded a fax as for direct send above. Finally click on Dial+Send or Dial+Receive.

Voice
This simply voice dials the entered number. It is intended to help in establishing calls for direct send/receive.

Another collection of button icons is provided. These provide various functions.

Cancel

Allows you to cancel whatever is going on. A cancelled fax will have its schedule entry set to Hold.

Hold

This holds all pending faxes.

Release

This releases all held faxes.

Next fax

This makes whatever would happen eventually happen immediately. Typically a fax send will fail for an obvious reason, and you want an immediate retry, rather than to wait for the automatic delay between attempts to take effect. All you then do is click on this button.

Show log

This analyses the log file, and presents the information in it, in an easily readable format. Incoming calls are shown inverted - white on black.

Schedule

This displays the usual schedule type window. However this schedule is unique because it is not attached to any file or fax. You can't use it for sending anything then. Instead you use it for receiving things. You can enter names or numbers to dial. The default action is to attempt to receive a fax from them. However directory entries can override this, and perform other operations. By making use of the repetition facility on the After dialogue box, you can arrange to call numbers at the same time every day or week and collect faxes, or perhaps for data services collect files or mail. See Chapter 8 on schedules for more information.

When things go wrong...

The control panel is probably the first thing you will turn to when there are problems. A level beyond this, is to see what the modem and ArcFax are actually saying to each other. Some users of older versions of ArcFax will have been all too familiar with the 'Debug' file facility which recorded this information in a file that could be examined by experts for the cause of trouble.

In this version of the program, we attempt to do much better. If you hold down SHIFT and click with the Select button on the icon bar icon, the Debug window will open. This shows commands from ArcFax to the modem in yellow, and the modems responses in white. At the start of each line a time

```
┌──────────────────────────────┐
│ ▣ ▨      Debug           ▣ │
│ 0402 AT                    ⬆ │
│ 0403 AT                      │
│ 0419 OK                      │
│ 0420                         │
│ 0439 ATQ0V1&H3&C1E1S0=0S10=50│
│ 0441 ATQ0V1&H3&C1E1S0=0S10=50│
│ 0457 OK                      │
│ 0458                         │
│ 0458 AT+FCLASS=1             │
│ 0459 AT+FCLASS=1             │
│ 0463 OK                      │
│ 0463                       ⬇ │
│ ⬅ ▭▭▭▭▭        ➡ ▣ │
└──────────────────────────────┘
```
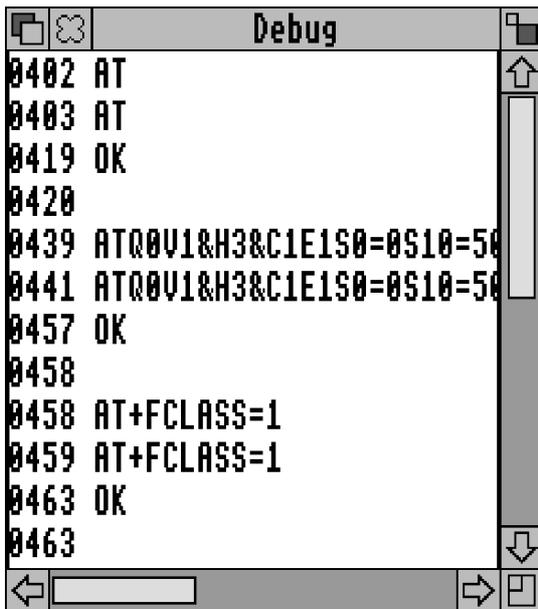
is given. There is a menu, this allows you to save the contents of the Debug window as file. It also lets you spool all debug output to a file - just like the old debug file but much easier to create. Other menu options allow the debug file to be closed. Finally you can choose if data will be recorded in the debug files. Usually it is modem commands and responses that matter, data is often not of interest, and gets in the way.

```
┌──────────────────┐
│      Debug       │
│ Save buffer ⬦   │
│ Open spool  ⬦   │
│ Close spool      │
│ Record data      │
└──────────────────┘
```

If you have problems, you should study this manual, the hints and tips chapter, and the files !ReadMe and !Modems on the ArcFax disc. If that fails, try studying the debug files and windows. If you see a modem command which provokes the response ERROR, you can guess that you are close to the source of the problem.

As a last resort you must contact David Pilling Software by email or post at the address inside the front cover of this manual. You may be asked to provide a debug file of whatever has gone wrong - this should be sent on disc or in other electronic form. Debug files contain binary data which printers do not always reproduce.

It is possible to position the caret in the debug window and issue commands to the modem (ATX2 etc.). However bear in mind that the debug window is a test facility, if you want a high performance terminal program, use Hearsay.

If you have a slow computer, having the debug window open whilst sending faxes may actually cause problems - in which case you should use the facility sparingly.

11. Voice

Introduction

Perhaps the only thing that can be said with any certainty about voice modems, is that things will be substantially different in a years time to how they are now.

The main features of a voice modem, are the ability to take sound off the phone line and turn it into data, and to reverse the process converting data into sound. In other words they can be used to record and playback messages. However a number of other features commonly come with voice - these are the ability to determine the type of an incoming call - fax, data or voice, the ability to recognise touch tones on the line, and to discover the phone number of callers before answering - caller id.

Data and voice calls can only be recognised by first answering the incoming call.

There is no firm standard for the AT command set extensions needed to control voice modems. We refer to all such commands sets as 'Class 8'. At the time of writing there are two common implementations, those from ZyXEL (in their own modems) and from Rockwell (in many different brands).

Data Compression

Anyone with a little knowledge of computers wonders why computer discs are not used for storing music, rather than CD's and tapes. The answer is that good quality sound requires a vast amount of data. In fact to make the storage of voice on disc feasible, it is both necessary to only save the minimum amount of data needed to make the sound intelligible, and to apply data compression techniques to it. This is no great problem, as telephone lines already distort sound - to save the phone companies money by reducing the amount of data they need to move around.

There is currently no agreement on the kind of data compression used. The most common method is ADPCM - however there are other more powerful techniques like CELP. In the long term one can expect standards to emerge here.

The parameters of a sound file, are the number of samples per second (typically 7200 or 9600), and the number of bits per sample (2 or 3). The larger these numbers, then the better quality sound you can expect, and also the more disc space will be needed to store a given length of message.

Another issue is the speed the data has to be sent to the serial port. It is only just possible either with very good compression, or with poor fidelity to get

voice through the traditional Acorn serial port which has a maximum speed of 19200 bps. If you don't send the data to the modem fast enough, typically it will mute and you'll hear the sound fade away.

For example, transmitting 2bits per sample, 9600 samples per second data, will because of stop and start bits need a serial port speed of around 22,000 bps. Typically such message files would occupy 2Kbytes of disc for every second of voice - quite reasonable.

Recording and Playing Back

In general, sound may come from the phone line, from the telephone handset, or from a microphone plugged into the modem. The cleanest technique is for your telephone to plug into the modem, and the modem to plug into the normal phone socket. By clever switching, your phone can then be used as a microphone for recording messages. In practice modem manufacturers do not go to the expense of arranging things like this. Instead to record messages you may have to remove the handset from the body of of your phone and plug it into the modem (difficult because the plugs on handsets don't match the usual phone sockets) finally using the earpiece as a microphone (really!), or use an external microphone, or perhaps just shout above the noise of the dial tone.

Possible destinations, for sound are the modem loudspeaker, the computer sound system, and of course the phone line. Again the best destination is the computers loudspeaker, however until modem manufacturers publish the formats of their compressed data, and/or agree on a standard this is not likely to come about. By and large though playback through the modems loudspeaker is acceptable.

Answering Machine Operation

When set to answer voice calls, the default action of ArcFax, is to answer the call, play a message file called !Message from the TX Batch down the phone line, go 'beep' and then record a message in the RX Batch. In other words to act as a simple answering machine.

Received messages, look like received faxes, they will have the word 'new' besides them. You play back messages by double clicking on them in the batch windows, or dropping them on the ArcFax icon bar icon.

Whilst playback is taking place, the standard ArcFax sound control window will appear. This window also allows you to create sound files, it can be accessed from the icon bar icon menu by selecting Voice.

Sound Control Window
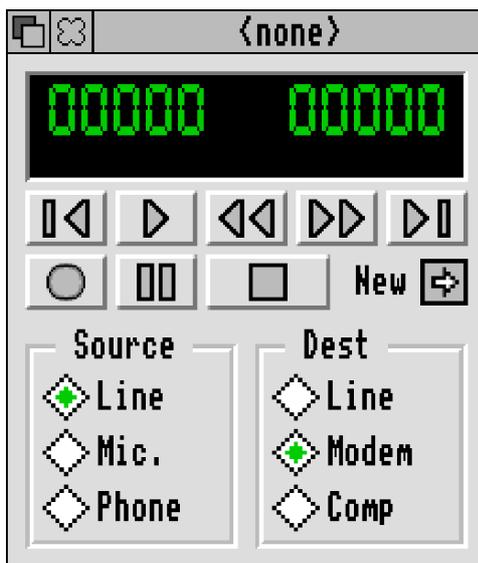
If you open the sound window from the icon bar by clicking on 'Voice...' on the icon bar icon menu, then it will have no file to work on. Typically then the first thing you want to do is to create a new voice file. You do this by clicking on the new button and dragging the resulting save box to wherever you want the file creating.

The rest of the buttons provide a sort of tape recorder emulation. There are buttons to jump to the start or the end of the file, to play it and to pause. To record, you must press the record button and then the play button. As on a real tape or video recorder, record is intentionally difficult to engage. Recording will commence at the current position. The two digital displays at the top of the window, show the current position in the file, and it's total extent.

At the bottom of the window, there are two banks of buttons to choose the source of sound to be recorded and the destination of sound to be played back. These are the options described above, sound coming from the phone line or a microphone of some sort, and being played back either to the modem loudspeaker, or to the phone line.

For basic users, all you will want to do, is to create a new file called !Message in the TX batch, with a greeting like "Hello this is Bob, leave me your name and number and as soon as I get back I'll call you". Voice callers will get this message, and you'll see their replies in the RX Batch.

The other common use is to start recording from the phone line whilst you are talking to someone - obviously very useful if someone is giving you complex instructions which you either can't note down, or want to go over again later. You can do this by creating a file, and then choosing line as the source, and triggering record.

Voice Configuration

The voice configuration window (See Chapter 9) will allow you to set how fast your modem samples, and what data compression format it uses within the available settings. You can also set the maximum time allowed for callers messages, and how long a silence will be interpreted as terminating a message.

12. Data

Introduction

Modems originally were used to send files. It's fitting that in a program designed to make use of the latest features of modems, like fax and voice there is provision for this traditional role.

In fact transferring files by modem is usually a complex and frustrating business. Older modems required configuration and often this had to be varied from one system to another. The appearance of newer modems has meant that it is feasible to adopt a common denominator of features with some chance that it will work on a broad range of modems. We do not expect the data side of ArcFax to work with every modem that has ever been made - if you want that, use a traditional data comms program like Hearsay. Rather the data side is designed to make sending a file as simple as a fax.

So to send a file, you drop it in the TX Batch window, and just like with faxes use the scheduling facilities to set up a destination for it. The destination must of course have a copy of ArcFax or something similar ready to answer.

If you configure ArcFax to receive data calls, received files will appear in the RX Batch, and can be dragged out of the batch window to wherever you want them to go. Note that ArcFax must be configured to receive data calls for files to be received.

This is all there is to using ArcFax for file transfer.

Sordid Details

Of course you may want to know how file transfer can be so simple. In fact Arcfax transfers files using the Zmodem protocol - it can connect to traditional Zmodem file transfer systems. When you put a directory in a batch, it is automatically converted into an archive file, and on receipt and extraction from the batch the archives are unpacked. So beneath the simple exterior, traditional file transfer lives on. This information may be of use if you want to use ArcFax for transferring files to a non-ArcFax system.

In particular, it is possible to set up ArcFax to retrieve mail from bulletin boards and so on, making use of the scheduling and server script facilities.

It will be best to configure your modem, to have error correction and data compression enabled. The exact AT commands to do this vary from one modem to another - see your modems documentation. The configuration can either be programmed into the modem (usually AT&W0) or put in the initialisation string that appears at the end of the modem driver in the function modem_initiate().

13. Script Files

Introduction

ArcFax has a powerful script language, which is similar to the C programming language. This language is used for writing modem drivers, and can be used for many other purposes.

The same language is used by the Hearsay II communications program.

The original ArcFax manual had a substantial amount of information on the script language here. Since many users did not like this, full details of the language are now given in text files on the ArcFax disc. The extra space made available in the manual being used to give more information on actually using ArcFax.

A Rough Guide

Modem drivers live in the directory **!ArcFax.Driver**. You can change the drivers to provide all sorts of extra features. However probably most users will only need to know that at the end of each modem driver, there is a function modem_initiate(), and that there is in this, a long string of AT commands which are given to the modem before ArcFax uses it. Under certain problematical conditions, you may have to either add or remove commands from this string. Remember AT commands can be concatenated, so instead of ATX2<RETURN>ATS0=0<RETURN>, you can just issue ATX2S0=0<RETURN>.

Another directory inside !ArcFax, **AutoRun**, holds script files that are executed when ArcFax is run. It is therefore possible to put files in AutoRun that modify the behaviour of ArcFax. By default you will find !Bands (sets phone time charges) and !Choices (program configuration). Similarly the **Library** directory holds scripts that are installed into ArcFax when it is run. Such files can be used to extend the program and provide new features. Finally the directory **Server** can be used to contain the special scripts that are executed after a connection is made.

14. Hints and Tips

Please read the rest of the manual. Please read the on disc documentation (!ReadMe and !Modems).

Upgrades do appear. So if you have found a particularly nasty bug, or want some new modem feature supporting - then probably the latest version of the program will solve your problems. Someone somewhere is probably still using version 1.00 of ArcFax- and missing out on lots of improvements.

Although Fax modems will usually say they use 9600 bps. It is necessary for your Archimedes to push data out faster. This is because faxes are sent using synchronous transmission. The link from your computer to the modem is asynchronous (there are start and stop bits). The computer/modem link therefore runs at 19,200 bps.

Suppose your local telephone exchange uses pulse dialling, but you want to use the Mercury system which is based on tone dialling. In this case you set up your prefix string with 131,T and use the configuration window to select pulse dialling. This means prefixed dial strings will look like ATDP131,T etc. normal dial strings will just use pulse dialling.

Faxes can be sent at two resolutions. Although the higher resolution gives much better quality, it will take twice as long to send faxes using it. You will therefore find that low resolution is often used because it is less expensive.

Sending a one page letter by fax is much cheaper than sending it by first class mail. However, once you start to send faxes whose pages contain a lot of detail or which have many pages, fax becomes less competitive. It is easy to produce faxes that will take 15 minutes or more to transmit.

Modems suffer from two common shortcomings, they will fail to dial with an error message "No Dial Tone", or drop the line before the remote end has seen sufficient rings to answer (or any!). The cause of the first problem, is new modems designed for System X (Tone dialling) exchanges not recognising the old style dial tone. The solution is to issue ATX2 to your modem, followed by AT&W0 to program the value into its memory. ATX2 makes the modem "blind dial" i.e. dial without waiting for a dial tone. The second problem is a result of the modem mistaking the "ringing" signal for "engaged", again the solution involves the ATX command, but ATX3 this time. More information on these AT commands can be found in your modem handbook.

Fax modems require data to be pushed into them as fast as they can send it. This implies that the serial system on your computer must be capable of a

certain speed. If it is not, fax sending will fail. There are two reasons why your serial system may not be fast enough. Firstly, that another program has damaged the extended serial buffers ArcFax installs when run. Secondly that the computer is not running fast enough. It helps to use a smaller screen mode (e.g. MODE 12) or to switch off the Fax header line from the Configuration dialogue box. This point will only apply to ARM 2 based machines i.e. pre-A540.

ArcFax is supplied in the configuration most likely to work. Don't change any setting if you don't understand all the implications of changing it. Don't configure ArcFax for things your modem is not capable of e.g. set 14400 for a 9600 modem, or try to use fax/data modems for voice.

When faxes are sent, the modems or fax machines at each end must agree on a common way the fax will be transmitted. They must settle on a method that both ends can support. Now most of the fax machines in the world, use one dimensional data compression, have a maximum speed of 9600 bits per second, and many have a slow scan time. A traditional fax machine can only cover the page in a certain time - so the data has to be expanded or padded with zeros to make transmission slower. The point is that even if you have a 14400 bps modem, and use two dimensional coding, often your faxes will go a lot slower than they could.

ArcFax can be run with some command line flags -quiet (don't become active) and -hold (hold any outgoing faxes).

Call Charge Bands

The are various times when ArcFax needs to know how much your phone company is charging for a particular call. For example when working out how much a call has cost, or when deciding when a given document can be sent.

In general this problem would require a much more sophisticated phone system than is available - for example the cost between every single location could be different, and vary with the time of day. Given this, we do our best by modelling the system on British Telecoms, each destination is assigned a "call band" - ranging from Local (low cost) to Mobile (high cost). We assume that the cost of making a call in each of these bands can vary through the day, and on the days of the week. There is no provision for coping with Christmas day and other public holidays. Another catch is that phone companies quantise calls - either by rounding call times to the nearest so many seconds, or to the nearest currency unit. Finally a minimum cost may be given per call.

Making ArcFax calculate the cost of calls and so on is easy, all you have to do is put each phone directory entry in a call band - and assign a priority to the fax you want to send. However the glue that binds ArcFax to the cost of a call is the !Bands file, this is a collection of script commands that lives in the AutoRun folder. Each line in it calls the setband() function. The definition of this is;

```
void setband(string & name,string & days,string & data);
```
The first argument is the name of the call band e.g. "L". The second argument is the days of the week which you are defining for the band. You have to define all the days in a week, but it is possible to define groups of days at once. The day definition string should look like "SuMoTuWeThFrSa".

Finally the last argument contains the data. This consists of groups of numbers splitting the band into zones throughout the day, each group can be separated from the next by a semi-colon, and the numbers in the group are separated by commas. The definition of a group is;

<start time>,<cost per second>,<priority>,<time>,<cost>,<min cost>;

The start time is the time in the day the rest of the data starts at, commencing with 0 at Midnight. It can be in either hours, or in hours and minutes (12:30).

Next comes the cost per second in pence multiplied by 100,000. All costs are scaled by this large factor.

Priority is the lowest priority fax that can be sent in this zone of the call band.

The priorities are numbered as;

0 Urgent
1 Important
2 Standard
3 Off peak
4 Economy
5 Cheap

You should ensure that at least some zone of a given band will allow the lowest priority faxes to be sent.

Continuing <time> is the rounding factor applied to the time of a call, and <cost> is a similar number for the price in pence * 100,000.

Finally <min cost> is the minimum price of a call again in pence * 100,000.

You may like to examine !Bands on the ArcFax disc to see how the file should look.

PDumperAF

The printer configuration described in Chapter 2, was originally intended as a stop gap, until a more sophisticated solution could be implemented. In practice it has proved reliable and so has been retained for this version of ArcFax.

In this method, everything printed goes to a temporary file inside ArcFax in uncompressed form, and that file is read in and processed later by ArcFax. The problem is that the temporary file may be very large, and processing it takes time. Another snag is that embedded commands, won't work if ArcFax is not on the same machine as the ArcFaxFix module - generating faxes across a network in other words.

The solution to these problems is a RISC OS 3 DMP Dumper module. With this, the output of the printer is fed into ArcFax in already CCITT 2D compressed form. Any embedded commands are picked up on the printing machine (as long as ArcFaxFix is loaded on it), and added to the printer file, where ArcFax can later find them.

Using the Dumper module, means printing is faster, less temporary disc space is required, and faxes can be generated on a network, making use of embedded commands.

On the ArcFax disc, there is a directory PDumperAF. In this there is a new printer configuration file, you should install it just like the standard ArcFax printer configuration file. Finally there is a module PDumperAF, this should be copied into the directory PDumpers inside !Printers.

After that printing will work as normal.

Please note that a site licence is required to use ArcFax on a network.

Serial Devices

By this we mean the use of ArcFax with serial ports other than the internal one. Traditionally a way of using extra serial ports was a glaring omission from RISC OS.

In late 1992, Hugo Fiennes proposed the so called 'Serial Device Block drivers' standard. This consists of an application directory called **!SerialDev** inside this there is a directory **Modules** containing a series of sub directories - one for each extra serial device.

To use ArcFax with one of these serial devices, you must interchange the position of two script files inside the !ArcFax application as follows;

(1) Hold down SHIFT and double click on **!ArcFax**.

(2) Find the **Library** directory and double click it.

(3) Holding down SHIFT drag the file **!Serial** from the **Library** directory to the directory that contains the file **!SerialDev** (this is the directory **!ArcFax**, and don't confuse this file with the directory which contains the drivers).

(4) Holding down SHIFT drag the file **!SerialDev** into the Library directory.

(5) You should now see that the files **!Serial** and **!SerialDev** have swopped their positions on disc.

(6) Load the file **!SerialDev** into Edit. Find the end of it, where there is a line like this;

```
setserialdev("SP_Dual",1);
```

Replace **SP_Dual** with the name of the directory for the device you are using. **SP_Dual** is correct for The Serial Port Dual Card. Finally replace '1' with the port number (e.g. 0 or 1).

(7) Next time you run ArcFax it will use the serial device.

There are pitfalls with block drivers. Some, for example the ones for the internal port don't provide serial data buffering - since buffering is vital for fax operation, these are likely to cause trouble. Secondly many block drivers do not implement block read and write operations correctly - see the file !SerialDev for how to make ArcFax work with them. Finally some blocks upset the internal port - !Serial contains a note on how to get around this problem.

The directory **!SerialDev** is akin to **!System** or **!Fonts**, and should be treated in the same way - put it in the root of your hard disc, or somewhere that it will be seen before you attempt to use it.