

# **XFAX 4.2**

## **User's Guide**

Revision C 20010601

**Nordic Messaging Technologies AB**

# **IMPORTANT**

## **To be read before installing XFAX**

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# Contents

- OVERVIEW ..... 5**
- INSTALLATION ..... 6**
- CONFIGURING THE SOFTWARE..... 7**
  - KEYWORDS ..... 7
  - ENVIRONMENT VARIABLES..... 7
  - ADDING ACTIONS ..... 7
  - XFAX AND MULTIPLE FAX DEVICES ..... 7
- SENDING A FAX..... 9**
  - FAXSEND ..... 9
  - TO TIE A NOTE TO A FAX..... 10
  - ONE FAX TO SEVERAL RECIPIENTS (GROUP TRANSMISSION) ..... 10
  - POSTPONED TRANSMISSION..... 10
  - THE ID OF THE FAX IN THE QUEUE ..... 10
  - PRINTING A FAX BEFORE SENDING..... 11
  - THE SCRIPT XFAX ..... 11
  - THE SCRIPT FAXADM ..... 11
  - DOCUMENT CODES ..... 11
  - THE TELEPHONE COST FILE ETCDIR/COST ..... 12
- RECEIVING FAXES..... 14**
  - AUTOMATIC PRINTING OF INCOMING FAXES ..... 14
- HANDLING FAXES ..... 15**
  - FAX QUEUES..... 15
  - TO GIVE A FAX “A PUSH” ..... 16
  - POSTPONING THE TRANSMISSION TIME..... 16
  - CANCELLATION OF A FAX..... 16
  - PRINTING A FAX ..... 16
  - LISTING FAXES IN A PARTICULAR DIRECTORY ..... 17
  - ROUTINE MAINTENANCE ..... 17
  - CLEARING OUT THE STATISTICS FILE ..... 17
- XFAX IN A WINDOWS ENVIRONMENT ..... 18**
  - THE XFAX WINDOWS CLIENT (PRINTER DRIVER)..... 18
  - USING THE ADDRESS BOOK IN XFAX ..... 18
- OVERLAY FILES AND COVER SHEETS ..... 20**
  - USING OVERLAY FILES AS FORMS AND COVER PAGES ..... 20
  - COVER SHEETS THE OLD WAY..... 20
- XFAX AND E-MAIL ..... 22**
  - SENDMAIL ..... 22
  - THE SCRIPT FAXMAIL ..... 23
- XFAX AND GHOSTSCRIPT (SENDING PDF AND POSTSCRIPT)..... 24**
- THE INTEGRATED HTTP SERVER..... 25**
- THE INTEGRATED SMTP SERVER..... 26**
- MODEMS AND FLOW CONTROL..... 27**
- COMMAND REFERENCE ..... 28**

<b>KEYWORD REFERENCE</b> .....	<b>32</b>
<b>TROUBLESHOOTING</b> .....	<b>41</b>
<b>TECHNICAL SPECIFICATIONS</b> .....	<b>43</b>
TESTED PLATFORMS .....	43
TYPEFACES IN XFAX .....	43
<b>NOTES</b> .....	<b>45</b>

# Overview

The fax system is constructed in accordance with a client-server principle, with a fax host that is run in the background and a number of client programs that the user utilizes to communicate with the host. Faxmaster, as the fax server is known, keeps order in the user's fax queues, checks authorizations, gives the user status information etc. In order to receive information from the faxmaster and give instructions to it, programs such as faxlogon, faxsend, faxq, faxrm etc. are used.

The advantage of a system constructed in this way is that the commands that are executed merely forward the task to the fax server, where all work is done, which quickly leaves the terminal free for new assignments.

From a system administrator's point of view, this arrangement means that the system is easy to configure and administer since the server does all the real work. When functions in the server can be administered in a simple way it automatically follows that the whole system is easy to administer.

The XFAX directory structure appears in the form shown below, the symbolic names of the various directories are used throughout this manual.

## Directory      Contents

ETCDIR	System files (configuration, messages, statistics, etc.) Can be changed by setting the environment variable XFAXDIR. The default directory is /etc/xfax.
FONTDIR	Font files. Changed in the configuration file with the keyword FONTDIR. The default directory is /etc/xfax/Fonts.
BINDIR	Programs (faxmaster, faxlogon, faxsend, etc.). The directory where the program files are located should be included in PATH for those users who are to have access to the fax system.
SPOOLDIR	Data and control files for the queue system. Can be changed with the keyword SPOOLDIR in the configuration file.
HOME/Fax	The user's own faxes, which have not been sent, are stored here.

In addition, the system uses /tmp for temporary files plus, depending on the operating system, /usr/spool/uucp, /usr/spool/locks or /etc/locks for locking files in combination with communication.

We use the following symbolic names for the various directories used by XFAX throughout the documentation.

XFAXDIR	Directory for the configuration files (default is /etc/xfax)
SPOOLDIR	Directory for messages in the outgoing queue (default is /usr/spool/xfax)
BINDIR	Directory for the executables (default is /usr/bin)

Some important files

XFAXDIR/config	Configuration file
XFAXDIR/stats	Statistics file
XFAXDIR/LCK.faxmaster	The faxmaster lock file that indicates the faxmaster is running

# Installation

The software is distributed in a tar archive, which extracts into a temporary directory, /tmp/xfax. After the extraction you run a installation script, /tmp/xfax/INSTALL, which asks questions about your configuration and then puts everything in its right place.

1. Go to the root directory  
`cd /`
2. Extract the archive, xfax42aix.tar for AIX for example  
`tar xvf xfax42aix.tar`
3. Execute the installation script  
`sh /tmp/xfax/INSTALL`
4. Check the installation by running `faxmaster -v` which should display software information provided that:
  - a. /etc/xfax is used for the configuration files or the variable XFAXDIR is set to the directory used.
  - b. The directory for the executables is included in PATH.
  - c. There is a valid license.
5. Now you can start the XFAX daemon, faxmaster, and you are ready to send your first message.

# Configuring the software

The behavior of XFAX is mainly controlled by a number of keywords used in the configuration file, config. You can alter the way XFAX acts by modifying config and then restart faxmaster. You restart the faxmaster by finding the process id, kill the process and then start the daemon again. Do not use the `-9` option when killing the faxmaster process.

## Keywords

To use a new keyword in the configuration file add the keyword, preferably at the end of the file, and then restart faxmaster.

Examples of some useful keywords:

DIAL_PREFIX	Dial prefix, for example "0" to get out through a PBX
INIT_STRING	Initialisation string for modem
XON_XOFF	Specifies XON/XOFF flow control is to be used
FLOW	FLOW=0 specifies do not try CTS/RTS flow control
EXECUTE_AFTER_SEND	Specify a program to be executed after transmission
MAX_RETRIES	Maximum number of tries to send a message
RETRY_TIME	Time, in minutes, between tries
ROUND_ROBIN	Used with multiple modem devices

There are more than 100 different keywords used by XFAX.

## Environment variables

A couple of environment variables can be used to change the behavior of XFAX:

XFAXDIR	Specifies where the XFAX config file is located, normally /etc/xfax.
XFAXCONFIG	Specifies an alternate config file to use. Must specify the filename including the complete absolute path.
XFAXID	Specifies for faxsend which id to use, this is displayed in the page header.
XFAXLICENSE	Specifies an alternate XFAX licence file to use.

Example, in Bourne shell:

```
XFAXCONFIG=/etc/xfax/config2
export XFAXCONFIG
```

## Adding actions

You can tell faxmaster that it should execute a specific script or program after a fax has been sent or could not be sent. This could be useful if you want to update your own database or similar and is done by using the EXECUTE\_AFTER\_SEND keyword in the configuration file:

```
EXECUTE_AFTER_SEND=/usr/local/bin/faxafter
```

The specified program will be called with a number of parameters.

## XFAX and multiple fax devices

To use multiple fax devices, or fax lines, with XFAX first of all you need an XFAX license that permits multiple lines. You can display the number of lines your current license permits using faxmaster `-v`.

To define which tty:s should be used by XFAX you use the FAXLINE keyword in the XFAX configuration file. If you for example want to use tty1 and tty2 you should use the following:

```
FAXLINE=tty1:tty2
```

By default XFAX, when sending a fax, tries to use the first line specified by the FAXLINE –keyword and if that one is busy it tries with the next one. You can use the keyword ROUND\_ROBIN to make XFAX use the fax lines in a round-robin manner. This means that it alternates between the line in a cyclic way. The first line specified is used for the first fax, then line number two and when the end of the list is reached it starts over from the beginning again.

All keywords in the configuration file specify attributes for all lines if not surrounded by the LINE ttyxx < ... > keyword. If you for example would like to define a different init-string for the modem on tty2, you could use:

```
LINE tty2 <  
INIT_STRING="AT&F&K4"  
>
```

Keywords that may be used for line-specific attributes:

```
ACCEPT_USERS  
AUTOPRINT  
CLASS  
DENY_USERS  
DIAL_TIMEOUT  
DIAL_PREFIX  
EXIT_STRING  
INIT_STRING  
MAX_BPS  
RECEIVE_ONLY  
SEND_ONLY  
XON_XOFF
```

When you display the queues for sent and failed faxes you can use the –x parameter to see which line was used. This can be useful for debugging purposes.



## Sending a fax

Many of the fax messages that are sent are of a very simple nature. They may involve confirmation of an agreed time, an order, cancellation or similar, which only takes up a couple of lines. In such cases it should be possible, by means of a simple manipulation, to send just such a fax from the command line or from your favourite word processor, with the minimum of work on the part of the user.

The system can convert text files with the HP Laserjet PCL commands - to be more precise the commands that are generated by an HP Laserjet or HP Laserjet Plus printer. This means that HP Laserjet printouts from within another program such as a word processor can be sent direct to XFAX with precisely the same results as if they had been printed out on the laser printer. The only difference is that the resolution on a fax is 200 dpi (dots per inch) as opposed to a laser printer's 300 dpi or more. Lists of the commands that are supported are given in the appendix. For a more detailed description of the PCL standard you are referred to printer manuals or similar.

The typefaces that accompany XFAX are the same as the typefaces found in the Z1A typeface cassette from Microsoft.

The command `faxsend` converts files to the fax format and asks the fax server to place the final fax in a queue awaiting transmission. When the time for transmitting is reached (normally immediately) an attempt is made to send the fax. If the transmission is successful the fax is removed from the transmission queue and the statistic is saved in the statistics file. On the other hand if the attempt is not successful, the fax is given a new time for a new attempt. The new time becomes the current time plus the number of minutes given by the keyword `RETRY_TIME` in the configuration file. When the maximum number of attempts, given by the keyword `MAX_TRIES`, has been reached the fax is moved from the transmission queue to the queue for unsuccessful faxes. A copy of the fax is saved in the directory "Fax" (see also `FAIL_DIR`) under the home directory for the user who first placed the fax in the queue. This user can also be informed of the failure via electronic mail if so desired. There is also the possibility of getting the system to execute a special command after the concluded transmission or failed transmission, see also the keyword `EXECUTE_AFTER_SEND`.

### ***faxsend***

The easiest way to send a fax using `faxsend` is quite simply to give a telephone number and a file name as an argument. For example:

```
# faxlogon
# faxsend 7586535 pricelist
```

which converts the text in the file "pricelist" to fax format and sends the finished fax to fax number 7586535.

Data can also be sent to `faxsend` via a so-called pipe as follows:

```
# cat price list | faxsend 7586535 -or
# faxsend 7586535 - <pricelist
```

This sends the contents in the price list file to the `faxsend` command which, since the parameters are specified, reads the data from *standard input*, converts and places the fax in a queue to a recipient with the fax number 758635. Note that you must be connected to the fax server before you can use any of the fax services. This is done with the command **faxlogon**.

If you send a fax abroad or via a telephone exchange, the modem may sometimes need to wait for a tone during the dialing of the number. In order to achieve this a "W" (wait for the tone) or a "," (wait 2 seconds) is inserted in the telephone number. For example, to make a call through a telephone exchange the number may appear as follows: 0W087586535. If the modem is connected to a telephone exchange line it is unnecessary to dial 0W before each telephone number. Instead you can use the keyword `DIAL_PREFIX` in the configuration file.

Note. If an area code given in the telephone number corresponds with that which is defined by `LOCAL_PREFIX` in the configuration file, it is automatically removed before the fax is placed in the queue. This means that it is

possible to always give the area code, e.g. in the telephone book, without any problems arising during transmission.

### **To tie a note to a fax**

In order to be able to keep a check on which fax is which, a note of a maximum of 80 characters can be tied to the fax. This note is then shown in the fax queues on its own line below the usual one. In order to add a note, the parameter `-n` is added to `faxsend`.

```
# faxsend -n "Quotation to Stefan" 7586535 quotation
```

Notes are shown in the following way in the fax queue:

```
# faxq
Outgoing
ID      Fax number      Enqueued      Next  St P Try LC  User      Pgs
182    7586535         09:41 19980601 09:41 PE 4  0   davcar    3
>>>> Quotation to Stefan
```

### **One fax to several recipients (group transmission)**

The same fax can easily be sent to several recipients if the recipients' fax numbers are stored in a file, one number per line, and then the parameter `-l` with the file name is used as an argument. Lines which begin with the symbol `#` are missed out and can thereby be used for comments. E.g.:

```
# faxsend -l customerfax news.txt
```

This sends the file *news.txt* to the recipients who are shown in the file *customerfax*.

If this method is used then only one copy of the fax file is saved, plus a small control file per recipient, which means that a minimum of hard disk space is taken up.

### **Postponed transmission**

A particular time for transmission can be given by using the parameter `-t` with the time as an argument. E.g.:

```
# faxsend -t 12:18 7586535 letter
```

which means that the file *letter* is put in the queue for transmission at 18 minutes past 12.

Naturally it is possible to combine the above functions so that e.g.:

```
# cat newsletter | faxsend -l customerlist -t 0:30 -
```

puts *newsletter* in a queue for transmission to all customers whose fax number is in the *customerlist* file. However the actual transmission does not begin before 12.30 at night, perhaps to minimize telephone costs.

### **The ID of the fax in the queue**

Each fax is given its own unique identity number before being placed in its respective queue. When being transmitted, the fax's ID can be shown on the screen, after the fax has been placed in the queue, by giving the parameter `-id` to `faxsend`. It can look like this:

```
# faxsend -id 7586535 letter
Converting files...OK
Placing fax in queue...OK
1136
```

The above fax received the ID 1136.

## ***Printing a fax before sending***

By using the parameter `-d`, the fax can be printed out on a printer.

```
# faxsend -d laser 7586535 letter
```

prints out the fax on the laser printer before it is placed in the queue. Normally the UNIX command `lp` is used for the printouts as well as the standard printer in the operating system. In order to change this the keywords `LP`, `LP_PRINT-OPTION` and `DEFAULT_PRINTER` in the configuration file are used.

## ***The script xfax***

Accompanying the XFAX distribution is a small command script known as **xfax**, which can be found under `BINDIR`. This command is for sending a fax, together with a cover sheet, in a simple way. The user is requested to feed in the recipient's fax number, name and company, and then a page with this is created and the sender's (your) information plus a message which can be entered in. You can also add files that are to be sent after the introductory cover sheet. This is useful if you wish, for example, to send a price list that is stored in a file to a prospective customer together with a few polite words.

You can also set up a telephone book to use together with `xfax`. Not only can global telephone books be arranged for all users of `XFAXDIR/faxdir` but personal telephone books can also be set up for each user in the directory `.faxdir` under the user's home directory. The format on the file is one recipient per line and each line consists of four fields with ":" as a field separator. The first field contains the name you want to use and the second field contains the fax number. Fields three and four can contain the recipient's name and company respectively, but these need not be given. E.g.:

```
icab:7586535:Stefan Norlin:Infoflex Connect AB  
nisses:012-345678:Nisse Karlsson
```

If a recipient is chosen from a telephone book the system proposes the recipient's name and company on the cover sheet, but this can be changed if so required.

Windows clients also use the telephone books in the system.

Note. If an area code given in the telephone number corresponds with that which is defined by `LOCAL_PREFIX` in the configuration file, it is automatically removed before the fax is placed in the queue. This means that it is possible to always give the area code, e.g. in the telephone book, without any problems arising during transmission.

## ***The script faxadm***

`Faxadm` is another script that gives a simple menu for the user's fax handling. This program is an example of how, with simple aids, you can create a more easy to use user interface for your fax users. You are welcome to look in both `xfax` and `faxadm` scripts to get your own ideas on how the tools in XFAX can be used.

## ***Document codes***

In order to facilitate transmission from an environment where it is not possible to give a fax number in a simple way, the `faxsend` command can handle codes that the user places in the document. During conversion `faxsend` searches for these codes and makes use of the information. The actual code is naturally removed and is not included in the finished fax.

The code is given in the document within square brackets (if it is not defined with the aid of the keywords `CODE_START` and `CODE_END`), e.g. `[[FAX=123456]]`.

Note. If an area code given in the telephone number corresponds with that which is defined by `LOCAL_PREFIX` in the configuration file, it is automatically removed before the fax is placed in the queue. This means that it is possible to always give the area code, e.g. in the telephone book, without any problems arising during transmission.

Thus it is only necessary to give:

```
# cat newsletter | faxsend -
```

It must be borne in mind that the text that contains the document codes must come up as ASCII text, even when printing out. If, for example, a font in Windows is used which is not in the printer, screen data will be generated for the text from the font descriptions in Windows. An XFAX cannot interpret this. The typefaces which can be used are those which are included in a Microsoft Z1A font cassette and they are indicated in font lists in Windows with a small printer.

The following codes are available:

**FAX=telno**

Gives the recipient's fax number. Several fax numbers can be given after one another and should then be separated with semi-colons ";" or colons ":".

**SYMBOL\_SET=id**

Indicates that the symbol set, id, should be used. For lists of permitted values see the Appendix: Commands - faxsend.

**CHAR\_SET = id**

Indicates that the character set, id, should be used. For lists of permitted values see Appendix: Commands - faxsend.

**TIME=tt:mm**

Indicates at what time the transmission of the fax should start.

***The telephone cost file ETCDIR/cost***

In order to be able to calculate the approximate costs for the fax transmissions that are made in the system, it is possible to include the actual telephone tariffs in the file ETCDIR/cost. A number of keywords are used in the file as follows:

**CHARGE\_PER\_MINUTE**

Indicates that debiting is done per minute and not using marks and mark intervals. This is Telia's new way of debiting in Sweden.

**COST\_PER\_MARK=kronor**

The cost of one mark is given in kronor (Swedish Crowns). Not used today in Sweden. Bear in mind VAT costs.

**MINIMUM\_CHARGE=price**

Gives the minimum debiting. In Sweden 0.29 kronor including VAT (November 1995).

**LOCAL\_ZONE**

Gives the zone that should be used when the area code is not included in the telephone number, i.e. with local calls. E.g.: LOCAL\_ZONE=LOCALLY

**AREA\_CODES<...>**

Here one area code is given per line and to which zone the area code belongs. E.g.

```
AREA_CODES<
08          LOCAL
```

```
031      AREA 3
009      ABROAD
0091     USA
>
```

The codes above (AREA 3 etc.) are arbitrary and can be changed, see also below under **ZONES**.

It is worth noting that the system goes through all area codes each time and if several lines match the area code in question, the last found always applies. The above means that it is possible to use ABROAD as a standard cost for foreign calls (which of course begin with 009) while for certain countries to which you often ring the cost can be specified exactly, as for USA in the example above. If the line with 009 ABROAD had not been there with the above, a number which began with e.g. 00949 (Germany) would not have been able to be matched against any line in the table and consequently would have been considered as a local call.

#### **ZONES time 1 [time 2 [...]] <...>**

Here the tariff zones that are to be found are given plus the cost per minute or the interval between marks at different times of the day. E.g.:

```
ZONES 0 8 18<
LOCAL  0.29 0.58 0.29
REGION 0.36 0.71 0.36
>
```

The above means that with e.g. local calls made between 0.00 and 8.00 the price is 29 öre per minute. Note that the names above, LOCAL and AREA 3, are arbitrary and can be chosen according to opinion and taste. However, the same name must of course be used in the AREA\_CODES section so that the right area code can be paired with the right cost.

## Receiving faxes

Receiving a fax is simpler than sending one. It does not require any special effort by the user. The faxmaster receives faxes in the background and sends a message to the system administration and possibly other users when this is done. The fax is placed in a queue for received faxes and can be printed out with the command **faxprint**.

What is also necessary is that the reception function is included in your license agreement and that the keywords SEND\_ONLY are **not** shown in the configuration file, ETCDIR/config.

### *Automatic printing of incoming faxes*

Incoming faxes can be automatically sent to a printer by defining the keyword AUTOPRINT in the configuration file. The format is AUTOPRINT="command", whereby command is something which can receive data and forward it to a printer. E.g.:

```
AUTOPRINT=" | lp -d LASER"
```

this takes the printer data and sends it on to the lp command via a pipe.

The data can also be saved in a file or similar by

```
AUTOPRINT=" >>/tmp/file"
```

# Handling faxes

The fax system contains a number of commands for handling faxes and fax queues. A description is given below of what can be done by using these commands. Generally, commands are run which affect a fax using the fax's ID number as an argument. The ID number can be found with the aid of the command **faxq**.

## **Fax queues**

The system separates faxes into four different queues, which can be shown by giving the parameters shown below as an argument to the command **faxq**.

<b>Argument</b>	<b>Queue</b>
none, -p	Outgoing faxes
-r	Incoming faxes
-s	Transmitted faxes
-f	Not transmitted due to a fault

E.g.:

```
# faxq
Outgoing
ID      Fax number      Enqueued      Next  St P Try LC  User      Pgs
14      55576861        11:01 19980430 11:41 SE 4  1 BUSY stenor    1
15      04012345        11:33 19980430 11:33 PE 4  1 NOAN davcar    3
>>>> Infoflex System AB, Lars
18      55576861        11:45 19980430 11:45 PE 4  2      davcar    1
```

The information that is in the columns above is in sequence:

The Fax's ID number, the recipient's fax number, the time and date when the fax was placed in the queue, the time for the next transmission attempt, status, priority, the number of attempts to date, the latest status code, the user who placed the fax in the queue plus the number of pages in the fax.

The following codes occur in the status column:

SE	Sending
PE	Pending
HO	Holding

The latest status codes can be:

BUSY	Engaged
NOAN	No answer
NOCA	The link was broken before connection was made (no carrier)
NODT	No dial tone
LINE	Communication with the modem is not functioning
INTR	Transmission interrupted
UNKN	Unspecified error

Numerical faults above 20 means that a fault has occurred during fax data transmission.

Some examples of fault code intervals:

20-39	Handshaking before the page failed
40-49	Fault in the transferring of data
50-	Handshaking after the page failed

## ***To give a fax “a push”***

Outgoing faxes that are awaiting transmission can be “given a push”, i.e. the transmission time can be set to the current time, by means of the parameter **-n** to faxq. E.g.:

```
# faxq -n 3
```

means that an attempt is made to immediately transmit the fax with ID 3.

## ***Postponing the transmission time***

The transmission time for a fax can also be brought forward in time by means of the parameter **-t** as shown below:

```
# faxq -t 12:18 16
```

The above changes the transmission time for a fax with an ID of 16 to 12.18.

## ***Cancellation of a fax***

A fax can be cancelled, i.e. removed from the outgoing fax queue, by means of the command faxrm which takes one or several IDs as an argument. E.g.

```
# faxrm 28 12
```

removes faxes with IDs 12 and 28.

Faxrm is also used to remove a fax from the statistic queues for sending and faulty faxes. When canceling such faxes, the fax is marked as having been removed in the statistics file, but statistic information still remains as a basis for statistical calculations. In order to remove old statistics completely, the command faxclean is used, which can only be run by the system administrator.

All the faxes in a queue can be removed by using the parameter **-all queue** to faxq, where the queue can be p (outgoing), s (sending), f (faulty) or r (receiving). These can also be combined, e.g. faxq -all sf. If you wish to remove all faxes up to a certain date, you use **-all** in combination with **-to date**. E.g.:

```
# faxq -all s -to 20010401
```

## ***Printing a fax***

Faxes that lie in a queue for outgoing faxes plus received faxes can be printed out on an HP Laserjet compatible printer. The command that is used is faxprint with the fax’s ID or a file name as an argument. The fax’s ID can be obtained by means of the command faxq.

For example:

```
# faxprint -d LASER 28
```

in order to print out a fax with ID 28 on the printer **LASER**, or

```
# faxprint -d hplj /usr/spool/fax/D.00023
```

in order to print out the fax file D.00023 on the printer **hplj**.

Normally, the UNIX command lp is used for printing and the standard printer in the operating system. To change this the keywords LP, LP\_PRINT\_OPTION and DEFAULT\_PRINTER in the configuration file can be used.



## ***Listing faxes in a particular directory***

Faxes that it has not been possible to transmit after the maximum number of attempts specified will be, if NO\_ERROR\_SAVE has not been defined, moved to the directory Fax under the home directory of the user who placed the fax in the queue. In order to list the faxes that are in this, or some other directory, the parameter **-d** is used to faxq. When this parameter is used alone, files in \$HOME/Fax are shown. E.g.:

```
# faxq -d
Directory /Fax
ID      Fax number      Sec Try Time      LC   User      Pgs
14      55576861           2   3 11:01 19980601 BUSY stenor    2
```

The command searches for files which have a name beginning with **S.** and **R.** and which are recognized as XFAX files. The information that is listed includes the recipient's fax number, the time when the fax was first placed in the queue plus the name of the user who placed the fax in the queue.

## ***Routine maintenance***

When XFAX is set up in accordance with requirements and started, the system requires very little maintenance. It can be worth keeping an eye on the size of the statistics file to see that there is no old data and control files remaining in SPOOLDIR. If you run mail integration, there is a debug trigger which creates log files under /tmp or ETCDIR. You will not want to have these files remaining if you run in production.

It is appropriate to set up a job for "cron" which is run each night or similar. Before clearing out the statistics files you can print out the data if you think you might have use for it.

By giving the parameter **-x** to faxq **-f** it is possible to see if there is one particular modem which causes more faulty transmissions than any other. In such a case there is a suspicion of there being a hardware problem. This of course only applies if several lines are run.

## ***Clearing out the statistics file***

After a period of use, the statistics file will have grown to a considerable size. In order to remove parts of the contents of this file the command faxclean is used.

As an argument for faxclean it can be indicated that information up to and including a particular date should be removed in the following way:

```
# faxclean -to 19980420
```

Note that faxclean must be run on the machine where the statistics file is kept, i.e. where XFAXDIR is to be found. The user who runs faxclean must also have the authority to read and write in the file, which is normally only the system administrator (root).

This command can, to advantage, be run automatically once a day or similar with the aid of cron.

# XFAX in a Windows environment

If you have a network with PC machines which run Windows and a UNIX machine which runs XFAX, these worlds can be combined and XFAX used direct from the Windows environment.

## *The XFAX Windows client (printer driver)*

The XFAX Windows client is actually a Windows printer driver. It works with Windows 95/98/NT4/2000. However it requires Winsock 2 which, for Windows 95, needs to be downloaded from Microsoft and installed.

Using the Windows client it is possible to:

- Send a fax from any Windows application you cant print from.
- Create cover sheets.
- Use XFAX phone books, stored on the XFAX server.

## **Installation**

1. Download the XFAX Windows client, xfax402.exe (august 2000).
2. Execute the self-installing file.
3. Fill out the host and port configuration to match the fax server configuration.
4. Done.

Now there is a printer available known as **XFAX** on **XFAX**:

## **Using the client**

If you want to send a document from Microsoft Word, for example you open the document in Word and choose Print. In the print dialog choose the XFAX printer. When you click OK the XFAX client will connect to the server and open the XFAX Send Fax dialog, as illustrated to the right.

## *Using the Address book in XFAX*

When using the XFAX Windows client you also get an opportunity to use an address book to simplify your facsimile transmissions.

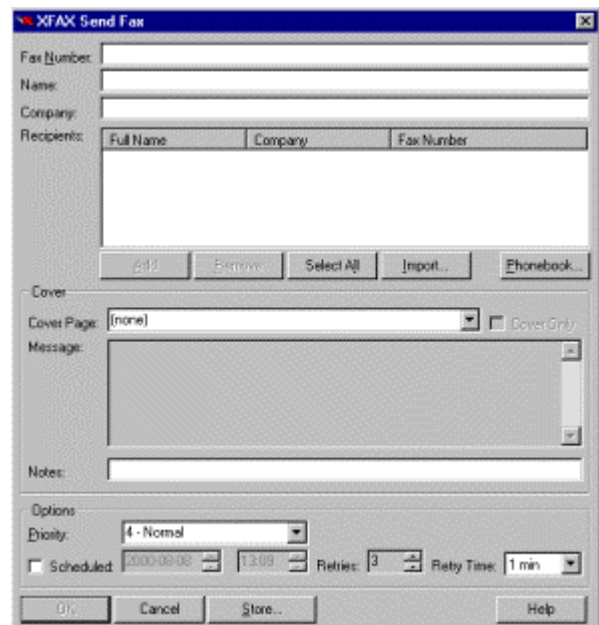
There are some ways using the address book in XFAX:

- 1) Create a txt-file which has the following content:  
"0855576861","Infoflex Connect","Fredrik Nilsson"  
"faxnr","Company","recipient"  
"faxnr","Company","recipient"  
and so on..

You can then import this file in the XFAX-dialog.

- 2) Put a file in the /etc/xfax/faxdir on the server side. The file has to have the following content:

```
1: 0855576861:Fredrik Nilsson:Infoflex Connect
2: faxnr:recipient:company
3: faxnr:recipient:company
```



3) Put a file in the users home-catalog/.faxdir on the server. The file has to have the following content:  
1: 0855576861:Fredrik Nilsson:Infoflex Connect  
2:faxnr:recipient:company  
3:faxnr:recipient:company

# Overlay files and cover sheets

Overlay files are files store in the XFAX fax format which can be used as cover pages or merge on to each fax page sent as a form template for example. This makes it possible to send faxes with a very nice layout. For example you can send order confirmations with your logotype and other form elements being merged on to raw text data which contains the order data.

## *Using overlay files as forms and cover pages*

In order to generate an overlay file you can use the XFAX Windows client. Put together your document in an application such as Microsoft Word and the print the document choosing the XFAX printer. When the XFAX dialog show up, press Store. You will then be asked for a name to "Store Coverpage As". Enter a filename. Then a XFAX fax file will be generated and stored on the UNIX server in the XFAXDIR/covers directory. This file can then be used as an overlay file.

In order to use an overlay file with faxsend you can do this:

```
faxsend -overlay /etc/xfax/covers/orderform 55576861 orderdata.txt
```

You can also use one overlay file as cover page and another overlay file as form for the rest of the pages:

```
faxsend -cover mycover -overlay_repeat -overlay_skip 1 -overlay orderform 55576861 orderdata.txt
```

Other examples of using overlay files: Adding a nice layout in an e-mail to fax gateway.

## *Cover sheets the old way*

It is quite easy to make neat cover sheets, page headings and page footings in XFAX with logotypes and other refinements. The principle is that you design your cover sheet (or whatever) in some suitable program which can make a print-out in the form of PCL code; to be more precise the data which is generated by an HP Laserjet Plus, for the file. For example, you can use Word or Pagemaker in Windows. You simply position the codes in the document where you want to have the name of the sender, recipient, etc. These codes should be in a typeface that means that the text is stored as text and not converted to screen data. In order to avoid this you should use the typefaces that have been built into XFAX. These are the same typefaces that are in a Microsoft ZIA font cassette. These typefaces are marked with a small printer in the typeface list in the application when the right printer is chosen. Print out the document to file. Stage 1 is now completed.

The next step is to replace the filed codes in each fax that is to have a cover sheet with the real values for sender, recipient, etc. This is best done with the command faxsr (Search and Replace). faxsr takes a number of arguments of the type "code = value" and then searches for the sequence "[:code:]" and replaces this with the values given. If, for example, you have set in the code "[:REC:]" in the cover sheet template ETCDIR/cover.icab where you want to have the recipient's company name and :RECNAME: where you want to have the name, faxsr is called up in the following way:

```
# faxsr ETCDIR/cover.icab "REC=Infoflex Connect AB" "RECNAME=Stefan Norlin"  
>cover.final
```

Note that the result is written to "standard out" in the example above and that above the field names are arbitrary.

At the end of a file which is created with a printout in Windows, a page feed (hex 0x0c) and Esc E (hex 0x1b 0x45) is always added to restore the printer after the print-out. faxsr bypasses these three characters automatically unless the argument -no\_skip is given.

## **Summary**

- \* Produce the document in a suitable application in Windows.
- \* Choose HP Laserjet Plus as the printer.

- \* Choose the font cassette Z: Microsoft 1A for the printer.
- \* Remember that document codes should exist with some of the built-in typefaces.
- \* Make a printout to file.
- \* For each fax that is to be sent, the template is “mixed” with the variable data with the aid of the command faxsr.

Some special field codes:

:MESSAGE: Replaced with the contents in the file which is indicated as an argument. E.g.  
“MESSAGE=/tmp/message” insert the file /tmp/message instead of the code.

:DATE: The current date is inserted. The format is yyyy-mm-dd

:TIME: The current time is inserted. The format is tt:mm.

Note that the script xfax automatically searches for a file cover under ETC-DIR. If this file is there it will be used as a cover sheet. You are welcome to look in xfax to find what field names have been used for the call to faxsr.

There are some things you may need to change in the PCL file, namely:

The symbol set up, XFAX wants to have Latin-1. Change any other control codes for the symbol set up to Latin-1 (ISO 8859-1). The control codes for Latin-1 are ESC(ON, Roman-8 ESC(OU etc. This is described in more detail in a HP Laserjet manual.

If the MESSAGE codes lie before the screen data in the PCL file you obtain the following scenario. Where you set in the MESSAGE field, the files given are set in during the operation. If the files are more than one page long so that a page break is set in, the screen data (logotype, graphics, etc.) is set in on the page. Therefore, this code must be set in last in the document.

Last but not least. You are welcome to contact your retailer or Inflex Connect AB if you need any help in arranging the cover sheet.

# XFAX and e-mail

XFAX can be used, to advantage, as a fax gateway in a system for electronic mail. By addressing your letters in a special way you can send both fax and electronic mail from one and the same program, the mail client.

## Sendmail

Described below how this functionality is set into sendmail that is the most common program for routing mail in the UNIX environment. Sendmail is a so-called MTS, Message Transfer Agent, which takes care of incoming and outgoing messages and ensures that they are passed on in the correct way.

You begin by deciding on a standard for how mail to the fax gateway should be addressed. Below we use an example domain which is known as infoflex.se and assume that one machine acts as both mail and fax gateway. Let us say that the machine is known as gw.

There are various options for addressing, two of which can be <faxno>.fax@infoflex.se and <faxno>@fax.infoflex.se. In the latter example it is necessary that any name servers in the network can handle fax.infoflex.se and steer on this mail to gw.infoflex.se. We have also presupposed that gw.infoflex.se lies hidden behind infoflex.se in the first example.

Below we use the first example since this does not require any changes to any name servers.

The configuration file for sendmail is known as sendmail.cf and is generally to be found under /etc or /usr/lib. Furthermore, we presuppose that the software is installed so that BINDIR is /usr/local/xfax/bin and that ETCDIR is /usr/local/xfax/etc. A tip is to copy sendmail.cf to e.g. sendmail.xfax and then make the changes in this. After having verified that the new rules, which have been added, function as they should, you can move sendmail.xfax to sendmail.cf and run the whole thing distinctly. All this is done in order to avoid disturbing traffic in progress as little as possible.

The first thing to do is to create a new delivery method in sendmail for faxes by setting up a new delivery handler, or delivery agent. Adding a line, most suitably close to the other definitions for delivery handlers as shown below does this.

```
Mxfax, P=/usr/local/xfax/bin/faxmail, F=lsDFM, S=10, R=20, A=faxmail $u
```

The above line defines a new delivery agent *xfax* which, when used, forwards the message to a new program, or shell script, which is known as faxmail and is to be found under /usr/local/xfax/bin. In the XFAX distribution there is an example of how such script can appear. Study this carefully. As an argument to this program a user name will be sent in. In our case this user name will be the fax number to our recipient.

Step two is now to set up a rule that says when the delivery agent we have defined above should be used. It can appear as follows:

```
R$.fax<@infoflex.se> $#xfax$:$1
```

This rule should be placed in the rule set up, ruleset, SO and states that all mail to \*fax@infoflex.se should be sent on to the delivery agent xfax. Before rule SO is used another rule, S3 will be used. This rule normally adds “<>” around the domain part of the address which explains that above there is R\$.fax<@infoflex.se> and not R\$.fax@infoflex.se. \$:\$1 above shows that the user name should be added to that which stands before .fax, in our case the fax number.

Note. Sendmail, which is often run as **root**, must have locking and evacuation rights to the script faxmail. Furthermore, the first line in faxmail, presupposing that faxmail is a Bourne-shell script, reads:

```
#!/bin/sh
```

in order that it should be executed correctly.

Now we can test that the rule works.

This is most suitably done by running sendmail in the test position by starting sendmail with the parameter **-bt**. If we use the temporary configuration file `sendmail.xfax` we must also indicate this to sendmail.

```
# sendmail -Csendmail.xfax -bt
```

When we execute the command we obtain a prompt. There we write in:

```
S3 7586535.fax@infoflex.se
```

Check that the mail is in a queue in XFAX. If this does not work it is only necessary to write out the log message at a strategic place in faxmail. Note that you can use the special shell variable  `$?`  which always contains the return code for the command last executed.

Set up any cover sheet, address filter to prevent unauthorized people using it etc in faxmail.

There are example lines for `sendmail.cf` in the file `sendmail.data` under `ETCDIR`:

### ***The script faxmail***

Faxmail is the script that takes care of the addresses and the letter data that comes from sendmail. The script that is supplied with the XFAX distribution is to be seen as a relatively complete example of how faxmail should function. However, a certain amount of manual adaptation is needed in order to adapt the script to the specific customer environment.

In faxmail you can choose to deal with the following:

- \* Save the message to file
- \* Run the message through a MIME filter (fax memory).
- \* Filter away the enclosures which cannot be handled as a fax and possibly inform the sender of the removed enclosures by means of mail.
- \* Check that the user has the authority to send faxes. Does the fax come from within his/her own domain? Is the user a valid mail user?
- \* Mount the message on a cover sheet. You may possibly wish to have different cover sheets for various departments or similar.
- \* Place the fax in a queue with the aid of `faxsend`.
- \* Report back on any problems via mail.

# XFAX and Ghostscript (sending PDF and Postscript)

Using XFAX with the software Ghostscript makes it possible to fax Postscript and PDF documents. Ghostscript is available more or less freely as long as you comply with the terms in the licence under which it is distributed. You can learn more at [www.ghostscript.com](http://www.ghostscript.com).

Below you find instructions of how to add a XFAX driver to Ghostscript 7.00, which today (june 2001) is the latest version of Ghostscript. The procedure does require knowledge on how to configure and compile a C source code distribution in a UNIX environment. You MUST have a C compiler installed on your UNIX box.

## Installing Ghostscript and the XFAX driver

1. Download the Ghostscript distribution. You find information on where it is available at [www.ghostscript.com](http://www.ghostscript.com). Extract it to, for example, /opt/gs7.00 (we use this path from now on), and follow the installation instructions to compile it on your platform. We do not provide support for the Ghostscript software itself.

2. Download and store the XFAX source files, gdevxfax.c and gdevxfax.h, into /opt/gs7.00/src. You can get the files from <ftp://ftp.infoflex.se/pub/xfax/ghostscript>.

3. When you compile Ghostscript you use one of the supplied makefiles, we use src/unixansi.mak. You need to modify the makefile to include the XFAX driver. Add \$(DD)xfaxhigh.dev to the DEVICE\_DEVS7 line in the makefile. In our distribution we changed line 339 in unixansi.mak:

```
DEVICE_DEVS7=$(DD)faxg3.dev $(DD)faxg32d.dev $(DD)faxg4.dev $(DD)xfaxhigh.dev
```

You also need to add the device to devs.mak. We added the following five lines to devs.mak at line 1259:

```
xfax_=$(GLOBJ)gdevxfax.$(OBJ)
$(DD)xfaxhigh.dev : $(DEVS_MAK) $(xfax_) $(GLD)page.dev
$(SETPDEV2) $(DD)xfaxhigh $(xfax_)
$(GLOBJ)gdevxfax.$(OBJ) : $(GLSRC)gdevxfax.c $(PDEVH)
$(GLCC) $(GLO_)gdevxfax.$(OBJ) $(C_) $(GLSRC)gdevxfax.c
```

On line three and five above the leading whitespace must be a tab.

Now you should be able to compile gs with support for the XFAX driver.

4. Using the new gs executable, try to convert one of the sample Postscript files using the xfaxhigh driver. For example:

```
# cd /opt/gs7.00/lib
# ../bin/gs -dNOPAUSE -sDEVICE=xfaxhigh -sOutputFile=test.fax ../examples/golfer.ps
```

5. If the above works out OK, you should now be able to fax Postscript and PDF files. If you are using XFAX 4.2a or later faxsend directly supports files with .ps and .pdf suffix respectively. Please note that faxsend requires the Ghostscript executable, gs, to be in the PATH and properly configured.

```
# faxsend 12345 test.pdf
```

If you are using an earlier version you need to do the conversion separately.

```
# gs -dBATCH -dNOPAUSE -sDEVICE=xfaxhigh -sOutputFile=test.fax test.pdf
# faxsend 12345 test.fax
```

## Troubleshooting

If you are experiencing problems there are two common mistakes to be mentioned here:

1) You should run "make -f src/unixansi.mak install" so that the files Ghostscript needs is placed in the proper locations. Among other files gs looks for gs\_init.ps in /usr/local/share/ghostscript/7.00/lib.

2) You need the font files which are distributed in separate tar files. gs looks for fonts in /usr/local/share/ghostscript/fonts.

The XFAX driver for Ghostscript is provided "as is" without warranties and we cannot guarantee support. However, we are helpful! Send your questions to [support@nordicmessaging.se](mailto:support@nordicmessaging.se).



## The integrated HTTP server

XFAX features an integrated HTTP server, which makes it possible to use a browser and to send a fax, display faxes, display queues etc. It is also possible to forward a fax as e-mail where the actual fax pages will be JPEG attachments in the e-mail.

You need to enable the HTTP server in order to use it (see `HTTP_ENABLE`). The default port the server listens to is 7180, this can be changed using `HTTP_PORT` in the config file.

If the server is enabled and is using the default port, point your browser to `http://hostname:7180`.

In order to limit access to the HTTP server you can specify hosts or networks that can access the server, see `ACCESS_HTTP`. You can also specify users and password using `USER_FILE`.

Keywords used by the HTTP server:

`HTTP_ENABLE`, `HTTP_PORT`, `ACCESS_HTTP`, `USER_FILE`

## The integrated SMTP server

XFAX features an integrated SMTP server, which makes it possible to send a fax via SMTP.

You need to enable the SMTP server in order to use it (see `SMTP_ENABLE`). The default port the server listens to is 7181, this can be changed using `SMTP_PORT` in the config file.

In order to limit access to the SMTP server you can specify hosts or networks that can access the server, see `ACCESS_SMTP`. You can also specify users and password using `USER_FILE`.

Keywords used by the SMTP server:

`SMTP_ENABLE`, `SMTP_PORT`, `ACCESS_SMTP`, `USER_FILE`

## Modems and flow control

When sending a fax the speed over the line is generally 9 600 bps (bits per second) or at best 14 400 bps. However, the transmission speed between computer and modem is always 19 200 bps in accordance with the specifications which apply for Class 2 compatible fax modems. This means that the modem has to receive data at a quicker rate from the computer than it manages to send in on to the recipient. As a result the modem must be able to stop the flow when its buffer is full so that the computer stops sending for a while until the modem has cleared the backlog of data it holds. It is this control of the data flow that is logically called flow control. There are two dominating variants of flow control today: CTS/RTS, hardware flow control, and XON/XOFF, software flow control.

CTS/RTS functions for communication from computer to modem so that the modem, when it can receive data, raises the signal CTS (Clear To Send) which is situated on pin 5 in a serial 25 pole port. When the buffer is full the modem reduces the signal and the computer detects this and takes a rest. This means that the drive routines for serial communication in the computer must be able to detect and handle these signals in the correct way. This is not always the case, particularly in older machines. However, where there is support for this type of flow control it is very efficient. It is quick and reliable even for communication at high speeds.

Variant number two, XON/XOFF, is based on another principle. For this two ASCII characters XON (hex 0x13) and XOFF (hex 0x11) are chosen as control characters and these are used to control the data flow. When transmitting from computer to modem, the modem sends the character XOFF to show that the buffer is, or is close to becoming, full. The software in the computer receives the character and stops sending data until the modem sends the character XON when it is ready to receive more data. This method does not really demand anything of the operative system, since support for XON/XOFF is generally built into the drive routines to the serial card. The disadvantage is that any waste matter on the connection can be interpreted as a control character and communication then gets caught up. Problems can also arise if the XOFF character does not arrive at the application before it has managed to send so much data that the buffer overflows. It is often possible to set the threshold levels for XON and XOFF in the modem and thereby control at what level the modem should send off the XOFF and XON characters.

The conclusion is that CTS/RTS is to be preferred, but this is not always supported by the operative system. XON/OFF is simple and easier to get to function satisfactorily. The support for CTS/RTS also varies from one operative system to another. On AIX it is often easy to get started. It is also satisfactory in those cases where serial cards are used which enable CTS/RTS to be set with stty parameters, e.g. DigiBoard.

# Command reference

Here we describe the syntax of each command in the software. You can use `-v` as an option for most of the commands to get syntax information for the command. To get debug information, especially good for `faxmaster`, use `-debug`.

All scripts supplied with XFAX are example scripts of which the functionality is not guaranteed. However, the intention with these scripts is that they should be as complete as possible and improvements are being made on a regular basis.

The following commands are used in the fax system:

## **faxadm**

Script which gives the user a simple, text-based, menu for the administration of his/her fax environment.

## **fax2bmp**

Converts a fax file to bitmap format. This functionality will be extended.

## **fax2hp**

Converts a fax file to HP Laserjet format (PCL code). Used by `faxmaster` and `faxprint` for printing out faxes.

## **faxclean [-older days] [-to date]**

Used to clean out the statistics file.

### **Parameters**

- `-v` Shows the program version and syntax.
- `-older days` Indicates that information older than the number of days given should be removed.
- `-to date` Indicates that information up to and including the date stated will be removed.

## **faxlogon [-q] [-u user]**

Used for connection to the fax server, `faxmaster`.

### **Parameters**

- `-v` Shows the program version and syntax.
- `-q` Does not write information to the screen.
- `-u user` Logs on as specified user. The specified user can be an existing user or a fictitious user. In a mail coupling it can for example be the sender's mail address.

The user cannot utilize the services of the fax system before he/she is connected to the fax host via `faxlogon`. When the maximum number of users in accordance with the licence agreement has been reached, `faxlogon` will deny any new users connection to the fax host.

## **faxmail**

Script which is used on integration with mail software, e.g. `sendmail`. Faxmail is described in more detail in the chapter "XFAX connected to mail".

## **faxmaster [-debug]**

### **Parameters**

- v Shows the program version and syntax.
- debug Means that information on events during program running are written to *standard out*.
- r Shows the return codes from the various fax commands.

This is the fax server which does all work on behalf of its clients and users. The fax host maintains fax queues, checks authority and licence information and reads data, control and statistic files. Faxmaster is normally started from one of the initiation scripts (rc-files) which are run when the system is started up. After this it remains in the background and doing its job without any fuss. Any fault messages are written out in the file **ETCDIR/Log/faxmaster**.

Faxmaster must be restarted when the configuration file, ETCDIR/config, or the serializing file, ETCDIR/.serial, are modified.

### faxmime [-e | file]

Used to remove information from a file on the MIME format. The result is written on *stdout* and consists partially of codes and partially of the file name with the extracted enclosures. The following codes can occur:

- !FROM The identity of the sender
- !SUBJECT The subject line

Files which are created are called <pid>.<seqno>.<ext> where the seqno is the enclosure's sequence number in the file, ext is the file's extension, which can for example be *txt* for a text file, and pid is the processor's id and is guaranteed to be unique.

You can then choose which enclosures you want to use and which ones you wish to discard.

This program will be developed as the use of MIME increases.

#### Parameters

- dir dir Indicates which directory the extracted enclosures will end up in. Normally /tmp.
- e Reads *standard input*, codes to BASE64 and writes in *standard output*.
- noheader Indicates that the program will not work mail-headers.
- prefix str Adds str to the prefix before *pid* in the file name.

### faxprint [-q] [-d printer] [ID [ID ...] | file]

Used to print out a fax on an HP Laserjet compatible printer.

#### Parameters

- v Shows the program version and syntax.
- q Does not write information to the screen.
- d printer Specifies that the printout will be sent to the stated printer.

The argument can be either a fax-ID or the name of a fax file. The printout data is sent to the standard printer if no special printer is specified. The printer should be HP Laserjet compatible and the data must not be filtered, i.e. the printout should be *raw*, otherwise it will be garbage. E.g. **faxprint -d LASER 13** or **faxprint D.510.000**.

### faxq [-reverse] [-p | -s | -r | -f | -d [directory]] [-h ID] [-n ID] [-t tt:mm ID] [-x]

Used to show the various fax queues, to change the sending times for a special fax and to list fax files.

#### Parameters

- v Shows the program version and syntax.
- p Shows the queue of outgoing faxes.
- f Shows the queue of faxes which it has not been possible to send.
- s Shows the queue of faxes which have been sent.
- r Shows the queue of received faxes.

- d [libr] Lists the fax files which are to be found in the directory *libr*. If there is no argument, the program looks in the directory Fax under the user's home directory (\$HOME). The information listed is, in sequence: ID, the recipient's fax number, the number of seconds connected, the number of retries, the time the fax has been in the queue and the number of fax pages. Note that you must have authority to read the directory in question.
- h Holds and releases faxes (hold).
- n ID Changes the time for the next transmission attempt to the given time in hours and minutes.
- x Lists the line used, cost and number of retries for sent and faulty faxes.

### **faxrm [-all queue] [-to date] ID [ID [ID ...]]**

Used to cancel a fax that is in a queue for outgoing faxes. Furthermore, you can mark sent and faulty faxes that have been removed to avoid having a mass of old faxes when you look through your queues. However, the statistics are kept.

#### **Parameters**

- all queue Indicates that all the faxes in the queue indicated should be cancelled.
- to date Used in combination with -all and indicates that only faxes up to and including a certain date should be removed.
- v Shows the program version and syntax.

You find out the ID of a fax by using the command **faxq**. Several faxes can be cancelled at the same time by giving several IDs separated by a space.

### **faxsend [-c id] [-s id] [-l file name] [-n note] [-p priority] [-t tt:mm] [-u user] [-d printer] [-q] fax number [file 1 [file 2...]] | - ]**

Converts a HP Laserjet file to fax format and sends information on the fax to the fax server which then takes care of the actual transmission.

#### **Parameters**

- v Shows the program version and syntax.
- c id Chooses the national set of characters when converting the text file to fax format. Possible values of id:  
0 (US), 1 (French), 2 (German), 3 (UK), 4 (Danish), 5 (Swedish), 6 (Italian), 7 (Spanish), 8 (Japanese), 9 (Norwegian), 10 (Danish 2) and 11 (Spanish 3).  
The standard values are given by the keywords **CHARACTER\_SET** in the configuration file.
- d printer Printing out of the file is done through the specified printer after the fax has been placed in a queue to the fax server.
- h Indicates that the fax should be parked, i.e. remain in the queue until it is released with the aid of faxq -h.
- id Writes the id(s) of the fax(es) in the queue on the screen.
- l filename Sends the same fax to all recipients whose fax number is in the stated file. The file should be a normal text file with one fax number per line. Comments can be set in by beginning the line with the symbol #.
- margin n Sets the default margin of the fax to 5 characters. See also: **DEFAULT\_MARGIN**
- n string Ties a note string to the fax. This note is then shown in the fax queues. Maximum length is 80 characters.
- p priority Indicates that the fax should have a certain priority. Normally 4. Permitted values are 1-7. 1 indicates the highest priority.
- q Does not write information to the screen (quiet).
- s id Chooses the set of symbols when converting text files to fax format. Possible values for id:

- 0 Roman-8
- 1 Latin-1 (ISO 8859-1)
- 2 Windows

The standard value is given by the keywords **SYMBOL\_SET** in the configuration file.

- simulate Runs a simulated fax transmission. This can be done to estimate the time and cost of sending a fax and to compare how these factors are affected by sending the fax at different times of the day. No fax is placed in the queue when this parameter is used.
- t tt:mm Gives a particular time when the fax is to be sent. In normal cases the fax is sent as soon as possible, but with this parameter the transmission can be postponed. The time is given in hours and minutes, e.g. **faxsend -t 12:34 7586535 faxfile**.
- u user Sends the fax as stated by the user.
- If this parameter is given, the program data reads from *standard input* instead of from the given files. E.g. **faxsend 7586535 - <letter** or **cat letter | faxsend 7586535 -**.

### faxsr infile [-]

Used to make a search & replace in HP Laserjet files. See further details in the chapter *XFAX and cover sheets*.

#### Parameters

- If this parameter is given, the program reads the data from *standard input* instead of the stated files.

### faxstat [-g]

Used to generate statistics reports and to show activity graphs.

#### Parameters

- v Shows the program version and syntax.
- g Shows the activity graph, i.e. how many faxes are in the queue at different times of the day. This function can be used to see where the largest telephone costs are and possibly do something about this by locating fax transmissions to those times of the day when the telephone tariff is lowest.
- s "string" Selection string which describes which data should be included in the report. Example: **faxstat -s "date=960120-960125"**.

If no parameter is given, statistics of the number of faxes in the queue are shown, plus the number of unsuccessful faxes, the connected time and the cost for the call in accordance with the tariff tables in the file **ETCDIR/cost**.

### faxwho [-u]

Used to find out which users are connected to faxmaster and from which tty: or IP addresses they are logged in.

#### Parameters

- v Shows the program version and syntax.
- u When this parameter is given only unique user names are listed.

# Keyword reference

The keywords below are used in the configuration file `ETCDIR/config`. The file can be modified according to requirements with the help of a normal text editor. If changes are made in the file the faxmaster must be stopped and started again for the changes to take effect.

When using several lines the keyword can be specific for a certain line (local keyword) given by means of the following syntax:

```
LINE tty <  
keyword  
etc.  
>
```

For example:

```
LINE tty1a <  
INIT_STRING = "AT&H3"  
DIAL_PREFIX = "0W"  
SEND_ONLY  
>
```

This means that several different types of modem can be used and that certain lines can be used only for sending and others only for receiving etc.

Note that keywords which apply generally for all lines, global keywords, must be placed in front of the keywords which are specific to the line in order to achieve the intended effect. If the same keywords occur several times, the last definition given always applies.

**FAXLINE = tty1 or  
FAXLINES = tty1[:tty2...]**

Gives the port or ports the fax system should use. /dev should not be given before the name of the port. Note that the number of ports which the system takes note of is limited by the scope of the licence agreement.

**ACCESS\_HTTP="string"**

Specifies which hosts or network can access the HTTP server.

Example: `ACCESS_HTTP=10.1.11.10/32,10.5.1.0/24`

See also: `USER_FILE`

**ACCESS\_SMTTP="string"**

Specifies which hosts or network can access the SMTP server.

Example: `ACCESS_SMTTP=10.1.11.10/32,10.5.1.0/24`

See also: `USER_FILE`

**ACCEPT\_USERS="user1[:user2 ...]"**

Specifies that only the given users are allowed to use a fax device. Useful when having multiple devices where a specific device should be dedicated to specific users.

See also: `DENY_USERS`

**ADMINISTRATOR="string"**



Indicates which user is to be the system administrator. As system administrator you can see and manipulate all the user queues, while as a normal user you can only see your own queues. Several administrators can be appointed by giving the user name separated by a colon, “:”, e.g. ADMINISTRATOR = “root:kalle”.

**ALERT\_USER = “recipient1 [recipient2 ...]”**

If for any reason faxmaster dies, a message is sent to the recipient indicated. Addresses of recipients can, of course, be both external and internal. Several users can be shown separated by a space.

**ARCHIVE\_SENT**

Indicates that faxes that have been sent should be filed under SPOOLDIR/ARCHIVE.

**AUTOPRINT=“string”**

Indicates that a received fax should always be sent to a printer. The string is a command that should take care of the printout data and forwards it to an HP Laserjet compatible printer. E.g.: AUTOPRINT=“ $\frac{1}{2}$  1p -dLASER”. The command is executed automatically when the system has received a fax.

**BROKEN\_SELECT**

This indicates that XFAX should be run on SCO Xenix.

**BUSY\_FAIL=number of retries**

Gives the maximum number of retries when engaged. Normally engaged is not counted as a failed attempt, but with the help of this keyword it is possible to get round this.

**CHAR\_SET=character set**

**CHARACTER\_SET=character set**

Gives the set of characters that should be used. See the command *faxsend* for possible options.

Standard value: 5 (Swedish 7 bit mapping)

**CLASS=string**

By default faxmaster tries to determine if it is a Class 2 or Class 2.0 device. By using CLASS=2 or CLASS=2.0 you can avoid that. It makes the initialisation a little bit quicker.

**CODE\_END=string**

Gives the character sequence to mark the end of a document code.

Standard value: “]]”

**CODE\_START=string**

Gives the character sequence to mark the start of a document code.

Standard value: “[[“

**COMPANY=string**

This gives the company name which will appear on the cover sheet when sending by means of the script *xfax*.

**DEBUG**

If this keyword is given, debug information is written to *standard output*, i.e. on the screen when faxmaster is started. Can be used to search for faults.

**DEFAULT\_FONT=filename**

Indicates the typescript that should be chosen when converting text in normal cases, when the typeface is not chosen by means of control codes. The file name is a file under the directory ETCDIR/Fonts. E.g. DEFAULT\_FONT = counu100.fp2 to choose Courier 10 cpi normal style.

**DEFAULT\_MARGIN=n**

When sending a plain text file this keyword can be used to add a left margin. For example to get a left margin of 10 spaces, define DEFAULT\_MARGIN=10.

Standard value: 0.

**DENY\_USERS="user1[:user2 ...]"**

Specifies that the given users are not allowed to use a fax device. Useful when having multiple devices where a specific device should not be available to specific users.

See also: ACCEPT\_USERS

**DIAL\_PREFIX="string"**

Gives the prefix that is added before the telephone number when calling. E.g. DIAL\_PREFIX = "0W" can be used to get the modem to come out through an exchange by dialling a zero and then waiting for a tone before the rest of the number is dialled.

**DEFAULT\_PRINTER=printer name**

Gives the standard printer to use when printing out a fax if no other printer has been explicitly given.

**DIAL\_TIMEOUT=seconds**

Indicates how long after an attempt is made to make a connection the attempt should be discontinued if the connection is not established.

**DOMAIN=domain**

Specifies the domain name to use when sending e-mail.

**EXEC\_WORKDIR=directory**

Indicates which directory should be used as a working directory when a program given by EXECUTE\_AFTER\_REC and EXECUTE\_AFTER\_SEND is executed.

**EXECUTE\_AFTER\_RECEIVE=program**

Gives a program which is executed after receiving a fax.

The program is executed with the following arguments in the sequence given:

**ID** ID of fax  
**Result code** Result code from the reception.

**EXECUTE\_AFTER\_SEND=program**

Gives a program which is executed when a fax is concluded, i.e. has been sent or not been able to be sent.

The program is executed with the following arguments in the sequence given:  
**ID** The ID of the fax  
**Fax number** The recipient's fax number  
**Result code** Can be any of the following values: 0 (OK), 4 (Lost carrier wave), 5 (No answer), 6 (No dial-tone), 7 (Busy), 8 (No answer), 19 (No line), 20 (Interrupted) or any of the

result codes the modem uses in the fax position (see the description of faxq in the chapter: "Dealing with faxes", for a more detailed description).

<b>No of retries</b>	The number of times attempts to send have been made.
<b>Notes</b>	Any notes which are tied to the fax. This is added with the parameter -n to faxsend.
<b>Conn. time</b>	The number of seconds connected during the transmission attempt. This is not exact, but is a good estimate.
<b>Concl. time</b>	The time when the fax is concluded, i.e. sent or an attempt has been made for the last time.
<b>User</b>	The user who placed the fax in the queue.

### **EXECUTE\_BEFORE\_SEND=program**

Gives a program which is executed before a fax is placed in queue.

The program is executed with the following arguments in the sequence given:

<b>ID</b>	The ID of the fax
<b>Fax number</b>	The recipient's fax number
<b>Result code</b>	Not used.
<b>No of retries</b>	Not used.
<b>Notes</b>	Any notes which are tied to the fax. This is added with the parameter -n to faxsend.
<b>Conn. time</b>	Not used.
<b>Concl. time</b>	Not used.
<b>User</b>	The user who placed the fax in the queue.

### **EXIT\_STRING="string"**

Gives a command string which is sent to the modem after the call is finished. Note that **ATZ** (reset) is always sent to the modem before the given string is sent.

### **FAIL\_DIR=directory**

The directory in which to place unsuccessful faxes. If **NO\_ERROR\_SAVE** is not defined an unsuccessful fax will end up under **\$HOME/Fax**, but with this keyword this directory can be freely selected.

### **FAIL\_FAXNO=fax number**

The fax number to send faxes which have not reached their destination. Can be used to get faxes which it is not possible to send to be sent to your own fax.

### **FAXHOST=string**

Used when XFAX is run in a network and indicates which machine should be used as a server.

The name can be a machine name or an IP address.

### **FAXNO=string**

Gives the fax number that appears on the cover sheet, when sending by means of the script *xfax*.

### **FLOW=value**

Normally XFAX tries to set up the port for CTS/RTS flow control. If you give 0 as a value to the keyword **FLOW**, this is not done.

### **FONTDIR=directory**

Indicates in which directory the typeface descriptions are located.

Standard value: `/etc/xfax/Fonts`

**GROUP=value**

Defines a user group. Users that belong to the same group can see and handle each other's queues. Repeating the use of this keyword can create several groups. Example:

GROUP = "kalle:nisse:pelle" creates a group with three users.

**HTTP\_ENABLE**

Enable the integrated HTTP server in faxmaster.

See also: HTTP\_PORT, ACCESS\_HTTP, USER\_FILE

**HTTP\_PORT=number**

Specifies which port the HTTP server should listen on.

Default: 7181

**ID="string"**

Gives your local fax identity. This identity is exchanged between fax units during connection. The identity is then shown on activity reports and similar. Normally you use your fax number or company name as an identity. Note that certain faxes cut the identity string after 10-11 characters, and so you should choose a short and clear string.

**INIT\_STRING = "string"**

Gives the initiation string that should be sent to the modem before connection is made. Parameters, which are specific to the modem, can be given for this, e.g. for flow control. E.g.: INIT\_STRING = "AT&K4M1L2" for an Intertex modem which is to run XON/XOFF.

**INT\_PREFIX = string**

Gives the telephone number prefix for international calls. 00 in Sweden. Used for example by faxstat.

**JETFAX\_BUSY\_TRIES = value**

Gives the number of retries when the line is engaged.

Used only when XFAX is used together with JetFax II.

**JETFAX\_COPY**

Indicates that a copy of the fax is to be printed out.

Used only when XFAX is used together with JetFax II.

**JETFAX\_PAGE\_TIME = value**

Gives the average value for a transmission time of a fax page. Used as an estimate when calculating costs.

Used only when XFAX is used together with JetFax II:

**JETFAX\_RECEIPT = value**

Indicates that a receipt should be printed out. Possible values: 0 - never, 1 - always, 2 - when there is a fault.

Used only when XFAX is used together with JetFax II.

**LANG = language code or  
LANGUAGE = language code**

Indicates the language which should be used in menus etc. Permitted values are **eng**, **swe** and **swe8**.  
Standard value: eng.

**LD\_PREFIX = string**

Gives the telephone number prefix for long-distance calls. 0 in Sweden. Used for example by faxstat.

**LINE\_FAIL = number of retries**

Gives the number of attempts when the modem cannot be initiated. Normally this is not counted as a faulty attempt, but with the help of this keyword you can get round this.

**LOCAL\_PREFIX=string**

Gives the telephone number prefix for your own dialing code area. If this is given it is automatically removed if it should be found when sending a fax.

08 in Stockholm.

**LOCK\_DIR=directory**

Indicates which directory should be used for locked files. This is dependent on the system.

**LOCKING\_STYLE=value**

Indicates which type of locked files should be created when locking fax lines. This is dependent on the operating system.

**LP=string**

Indicates which command should be used when printing out a fax.

Standard value: "lp"

**LP\_PRINT\_OPTION=string**

Indicates which parameters are used together with the printout program, normally lp, to indicate a special printer, e.g. "lp -d laser".

Standard value: "-d"

**MAIL\_ON\_ERROR**

Indicates that the mail should be sent to the user who has placed a fax in the queue if it has not been possible to send it.

**MAIL\_ON\_SUCCESS**

Indicates that mail should be sent to the user who has placed a fax in the queue if the fax has been sent with the status OK.

**MAX\_BPS=speed**

Indicates the maximum speed of the fax modem when sending a fax in the unit bits per second (bps). Permitted values: 14400, 9600, 7200, 4800 and 2400.

Standard value: 14400

**MAX\_TRIES=number of retries**

Gives the maximum number of times a fax should be tried to be sent before the system gives up and places it in the queue for faxes not sent.

**NICE\_CONV=priority**

Indicates that a lower priority than normal should be used when converting a fax.

The value can be between 0 and 20. 20 gives the lowest priority.

**NICE\_SEND=priority**

Indicates that higher priority than normal should be used for sending a fax.

The value can be between 0 and 20. 20 gives the highest priority.

**NO\_ERROR\_SAVE**

Indicates that the fax yfile should not be saved if it has not been possible to send a fax in a queue. This keyword is normally defined in the configuration file.

**NO\_STATISTICS**

Indicates that statistics should not be saved in the file ETCDIR/stats.

**OLD\_SCO**

If you use a SCO version before OpenServer5 and the port name has a name in the format ttyx00, where x is a capital letter, this keyword must be used so that the handling of locked files is done in the right way. This is due to a bug in older SCO versions.

**PARTIAL\_PAGES**

Indicates that the last page of a fax should be cut off after the last line of data and not filled out to a full A4. This saves time when transmitting and space on the hard disk.

**PORT=value**

Indicates which port should be used when XFAX is run in a network.

Standard value: 6001

**PRINT\_REC\_TO\_LEFT=column**

With this keyword you can adjust where the print-out of incoming faxes will be positioned on the paper. The value indicates the number of columns the data should be moved to the left.

**PULSE**

Indicates that pulse choice should be used when making a call.

**QUIET**

Indicates that the client program should be quiet and not write information onto the screen as standard. For example this is equal to calling *faxsend* with the argument -q.

**RESOLUTION**

Gives the standard resolution of the faxes that are sent out. Note that if the fax called does not support high resolution then low resolution is negotiated. Possible values are HIGH or FINE for high resolution and LOW or STANDARD for low resolution.

A high-resolution fax is precisely twice as large as a low-resolution fax and takes twice as long to send (approx. 1 minute for an A4 page).

Standard value: HIGH (high resolution)

**RETRY\_TIME=minutes**

Indicates at what minute intervals attempts should be made to send a fax that is not successfully sent.

### **REVERSE\_STATS**

Indicates that statistics lists (sent and failed faxes) should be shown in reverse order, i.e. with the most recent fax first.

### **ROUND\_ROBIN**

When using multiple fax devices with XFAX the standard behavior is to always use the first available line for transmission so if FAXLINES=tty00:tty01, tty00 is always picked if available. By using this keyword fax lines are always used in sequential order. That is, first tty00 is used then tty01, tty00 and so on. This is really the best way to minimize non-successful attempts if a fax device should break down.

### **SEND\_BPS**

Normally the communication speed between the computer and the modem is 19.200 bps. By using this keyword that can be changed. Not any value can be used. Possible values: 2400, 4800, 9600, 19200, 38400.

Standard value: 19200

### **SEND\_ONLY and RECEIVE\_ONLY**

Indicates that fax lines should be used only for sending or only for receiving. This function is also controlled by the scope of your license agreement. If the fax modem is used for incoming modem traffic and outgoing fax traffic SEND\_ONLY must be given, otherwise the fax server will try to answer and receive incoming calls as a fax.

### **SMTP\_ENABLE**

Specifies that the XFAX SMTP server should be enabled.

See also: SMTP\_PORT, USER\_FILE, ACCESS\_SMTP

### **SMTP\_PORT=port**

Specifies which port to be used by the SMTP server.

Standard value: 7180

### **SMTP\_SENDER="string"**

Specifies a sender for e-mails that XFAX generate.

### **SMTP\_SERVER=hostname**

Indicates which SMTP server to use for sending e-mail.

### **SPOOLDIR=directory**

Indicates which directory should be used to store data and control files.

Standard value: /usr/spool/fax

### **STTY=string**

Gives a stty string that should be sent to the port after it has been opened. Can be used to set special parameters. However it need not normally be used.

### **SYMBOL\_SET=symbolset**

Gives the set of symbols that should be used. Applicable choices are 0 for Roman-8, 1 for Latin-1 (ISO 8859-1) and 2 for Windows.

Standard value: 1 (Latin-1)

### **T30\_ECM=value**

Set the T.30 parameter ECM (Error-Correction Mode) to the specified value.

### **T30\_RTC=value**

Set the T.30 parameter RTC to the specified value.

### **T30\_PAGELENGTH=value**

Set the T.30 parameter page-length to the specified value.

### **STONE**

Gives the tone that should be used when calling.

### **USE\_SHM**

Specify that the server should use Share Memory for inter-process communication.

Not all platforms support Shared Memory.

### **USER\_FILE=filename**

Specifies a file to use for valid users of the HTTP or SMTP server.

Format of the file: username<TAB>password<TAB>type of server

Example:

user1	secret	HTTP
user2	moresecret	HTTP,SMTP
user@domain.com	sec123	HTTP,SMTP

### **WAIT\_FOR\_TONE or WAIT\_FOR\_DIALTONE**

Indicates that the modem should wait for the connection tone before it begins to dial the telephone number. This is normally required if the telephone line is not connected to an AXE station where the connection tone is obtained immediately. This gives the same result as a "W" placed first in the telephone number.

### **XON\_XOFF**

Indicates that the software flow control, XON/XOFF, should be used when sending a fax. Note that INIT\_STRING must be set in conformity with this.



# Troubleshooting

In order to obtain more information from faxmaster on what happens while the program is being run, you can start faxmaster with the parameter *-debug*. Then a little more detailed information is written on the screen while the program is being run. Also look in the log files under ETCDIR/Log for the respective command. Interesting information can be found there if something has gone wrong.

If there is a problem with the modem, you can see if it is possible to call out by using the normal UNIX command *cu*. If you get the fault code NOAN (no answer) or NODT (no dialtone) you can try with a normal telephone in the jack to see if you get a tone and can ring the recipient's fax using this to check that it is actually answering.

## **It is possible to use the system if you are logged in as super-user (root), but not otherwise**

This is most probably a problem with regard to authority. Go through the various files and libraries which XFAX uses and check the owner and rights.

## **Converting a fax is not successful**

Are the typeface files in the right place, unpacked and with the right authority?

The program looks for files by looking at what FONTDIR is set at in the configuration file.

In the delivery medium the files are packed with the UNIX command *compress*. The file name then ends with a "Z". The files should be unpacked during installation. If it has not been possible to do this, it should be done manually by going into the directory where the files are located and writing **compress -d \***.

All users must have the right to read typeface files and to read and search in the directory where they are located.

## **When I start faxmaster I obtain the message: Faxmaster is already running, although it unquestionably is not. Why?**

Faxmaster creates a locking file, */tmp/LCK.faxmaster*, when it starts up which should be removed automatically when faxmaster terminates. If faxmaster is killed with *kill -9* or is terminated in some other unconventional way the locking file may remain. Remove this with **rm /tmp/LCK.faxmaster** and try again. **Note.** Faxmaster should not be killed with *kill -9*. Instead, use signal 15 that is the standard value for *kill*.

## **Faxmaster does not send a fax that is in a queue to be sent. The status is PE.**

Check whether there is a locking file for the port under */usr/spool/uucp*, */var/spool/locks* or another directory depending on the operative system, the name of the file begins with *LCK*, in SCO this is called e.g. *LCL..ttyxx*. If such a file exists and no program uses the port, remove the locking file with **rm**. With locked files each program writes its process-id, as ASCII or binary. Again depending on the operative system.

## **There is a problem when sending a fax abroad**

Do you use Tele2 and dial 007 instead of 009? Ensure that the line the modem is connected to is registered with Tele2.

## **Transmission of faxes is often broken off before they are finished or there are lines missing in the middle of a fax.**

This is probably a problem of flow control. Depending on the type of modem and the serial ports in the computer, sometimes software and other times hardware flow control should be used. Begin by setting up the system for XON/XOFF. This is generally the easiest way to get started.

In order to run RTS/CTS flow control, an initiation string should be used which sets up the modem for RTS/CTS. In addition, it is necessary that the serial port is set up for, and can handle, RTS/CTS. This method is to be preferred but is not supported by all serial cards.

**There is a problem with sending a fax on HP-UX.**

The program is compiled on a HP 9000/712 and as standard tries to set up hardware flow control. This is not always so satisfactory on HP's server machines. Therefore you can shut off "the hardware control attempt" by adding FLOW = 0 in the configuration file.

# Technical specifications

XFAX is fax software for sending Group 3 faxes with the aid of Class 2-compatible fax modems. The maximum speed for sending faxes is 14.400 bps, however 9.600 bps is the most common. This depends on the other fax unit. The speed of computer to modem is 19.200 bps.

## Modem drivers

Class 2 (proposed TIA/EIA 592) and Class 2.0 (TIA/EIA 592)

## File formats

ASCII, HP Laserjet (PCL-4), Modified Huffman. Files are usually stored in Modified Huffman format since this is a very efficient way of compressing this type of data.

## Memory required

This depends to some extent on the operative system, but the whole system occupies between 2 Mb of memory after installation. When using the system the following is added: One fax file with a normal page of data (A4) needs between 20 and 80 kb.

## Tested platforms

AIX 3.2.5  
AIX 4.1  
AIX 4.2  
AIX 4.3  
HP-UX 9.x  
HP-UX 10.x  
HP-UX 11.x  
Linux (Redhat)  
SCO OpenServer 5  
SCO UNIX  
SCO UnixWare 2.1  
SCO UnixWare 7  
SINIX  
Solaris 2.x (Intel and Sparc)

## Modems tested

The following modems have been tested with XFAX and functioned satisfactorily. However, for the best functioning we recommend the ZyXEL modem that has been shown to be the most stable with respect to fax functionality.

Intertex, various models  
Multitech, various models  
US Robotics Courier (with Class 2.0)  
US Robotics Sportster (with Class 2.0)  
ZyXEL U-1496E  
ZyXEL Omni 288S

Problems can arise - particularly sensitive is the reception of faxes - if the serial ports which are used are not of good quality. The ports should be equipped with UART 16550 or similar circuits with buffering. Intelligent cards such as DigiBoard are equipped with such circuits.

## Typefaces in XFAX

The following typefaces are built into XFAX with their respective escape sequences:

Courier 10 cpi <ESC>(s0p0b0s0t10H  
 Line Printer 16.6 cpi <ESC>(s0p0b0s3t16.6H  
 Helvetica 8 pt <ESC>(s1p0b0s4t8V  
 Helvetica 10 pt <ESC>(s1p0b0s4t10V  
 Helvetica 12 pt <ESC>(s1p0b0s4t12V  
 Helvetica 10 pt, italics <ESC>(s1p0b1s4t10V  
 Helvetica 12 pt, italics <ESC>(s1p0b1s4t12V  
 Helvetica 10 pt, bold <ESC>(s1p3b0s4t10V  
 Helvetica 14 pt, bold <ESC>(s1p3b0s4t12V  
 Helvetica 14 pt, bold <ESC>(s1p3b0s4t14V  
 Times Roman 10 pt, italics <ESC>(s1p3b1s4t10V  
 Times Roman 12 pt, italics <ESC>(s1p3b1s4t12V  
 Times Roman 10 pt, bold <ESC>(s1p3b0s5t10V  
 Times Roman 12 pt, bold <ESC>(s1p3b0s5t12V  
 Times Roman 14 pt, bold <ESC>(s1p3b0s5t14V  
 Times Roman 8 pt <ESC>(s1p0b0s5t8V  
 Times Roman 10 pt <ESC>(s1p0b0s5t10V  
 Times Roman 12 pt <ESC>(s1p0b0s5t12V

## Notes