UNIVERSITY OF EDINBURGH
Edinburgh Regional Computing Centre

User Note 34

(March 1986)

Title:

The EMAS File Transfer System

Author: John Henshall

Contact: Advisory service

Software Support Category: See Note 15

Contents

Edinburgh Regional Computing Centre

James Clerk Maxwell Building, The King's Buildings, Mayfield Road, Edinburgh, EH9 3JZ. Telephone 031-667 1081

1. Introduction to the EMAS File Transfer System

The File Transfer System implemented on EMAS is based on the standard protocol NIFTP-B(80) [Network Independent File Transfer Protocol] and provides inter-computer file transfer over local, national and international networks (e.g. EDNET, JANET, PSS, IPSS) with any other computer system that has also implemented the protocol.

The File Transfer System has been implemented as an executive paged System Process FTRANS (see EMAS 2900: User's Guide, page 1-4) and communicates with users via a new command for transfer request submission and the MAIL command for reporting on the transfer.

2. A User View of the File Transfer System

2.1 Definitions

A TRANSFER is a movement of data between two file units, (from) a SOURCE and (to) a SINK.

The activity that is undertaken on the SINK is defined as the MODE of the transfer.

The computer on which you are working and on which you will issue the command that will initiate a file transfer is known as the local machine. The other computer involved in the transfer is known as the remote machine.

If a local file unit (a file unit on the local machine) is to be the SINK then the transfer is said to be INto the local machine. If a local file unit is to be the SOURCE then the transfer is said to be OUT of the local machine. IN or OUT is the DIRECTION of the transfer.

2.2 Source and Sink

A SOURCE or a SINK which is on a remote machine is defined by the following set of information:

1) External System - the mnemonic by which a remote machine is known to the local machine

2) External Username - the second party to this transaction who is on the remote machine

3) External User Pass - a password which allows file transfer activity with the second party

4) A filename, or jobname, or device name.

[In some cases further information may be required. Provision has been made for it to be specified although it will not be discussed here. (Section 3.2.1 'Options:'.)]

Either the SOURCE or the SINK will be a file unit on the local machine, in which case all that is required to define it is the filename, or jobname, or device name. In all transfers the SOURCE will always be a file.

2.3 Mode of Transfer

The activity undertaken on the SINK as a result of the transfer is defined by the MODE of the transfer. The following modes are available:

a) REPLACE : the file SOURCE is to replace an existing file SINK, or to report an error otherwise.
(If the file SINK is on EMAS then cherished status and permissions of the existing file will be retained.)

b) MAKE : the file SOURCE is to make a new file SINK if SINK does not exist, or to report an error otherwise.

c) FILE : the file SOURCE is to replace an existing file SINK if SINK exists, or is to create a new file SINK otherwise. i.e. FILE is equivalent to 'REPLACE or MAKE'

d) JOB : If the DIRECTION of the transfer is OUT then the file SOURCE is to be submitted as the job SINK, if IN then the SOURCE (output held on a job output Spool queue) is to be output on local device SINK. [For details of job submission to EMAS see Appendix 4]

e) OUTPUT : the file SOURCE is to be output on device SINK.

3. User Interfaces to the File Transfer System

3.1 Interfaces

Two types of interface to the system are defined.

a) A submission interface which enables a user to queue a transfer request.

b) A monitoring and control interface which enables a user to monitor the progress of a transfer request and terminate a transfer request at any stage.

3.2 The Submission Interface

A file transfer is initiated on EMAS by issuing the following command:

Command: TRANSFER parameter list

The parameter list is optional. If it is omitted then Transfer will prompt for the information required.

3.2.1 The Prompts

The prompting sequence will lead you through the transfer initialisation as follows:

External System : - you reply with the mnemonic by which the remote machine is known to the local machine. Reply ? or ?key for help (see 3.3.2 for a description of ?key activity).

Direction : - you reply with the direction of the transfer. (See Section 2.1)

Mode : - you reply with the MODE of transfer required. (See Section 2.3)

External username : - you reply with the username of the second party to the transaction. If none required hit <return>.

External user pass : - you reply with the password for the second party that permits file transfer activity. If none required hit <return>.

and then *one* of the following, depending on the MODE you specified

External filename : - you reply with the required filename on the filestore of the second party.

External device name: - you reply with a device name on the remote machine.

External job name : - you reply with a job name for the remote machine. If none required hit <return>.

and then *one* of the following, depending on the MODE you specified

Local filename : - you reply with a local filename.

Local device name : - You reply with a device name on the local network.

Local job name : - You reply with a job name for the local machine.

followed by

Options : - This is a repeated prompt terminated by a reply of '.END'. The possible responses are detailed in Appendix 1. The first two characters are sufficient for the option to be recognized (e.g. .E for .END). The requesting of a particular option may result in further prompts for information and, as in all other cases, replying '?' will give Help.

At this stage the transfer system attempts to queue the request and if successful reports with the message:

NIFTP-B(80) Transfer queued, entry : T322

where the number is the document number by which this transfer is known.
An error is given should the attempt to queue the transfer fail.

Notes:

For security the password is not echoed to your terminal.

To any prompt you can reply '?' and help will be given. For instance, a list of communicating remote machines can be obtained by replying '?' to the first prompt.

3.2.2 The Single Line Command

The basic single line command is presented in terms of the definitions in Section 2.1 as follows:

Command: TRANSFER SOURCE, SINK, MODE

Command: TRANSFER ? for help

One of SOURCE and SINK will refer to a file unit on the local machine and will simply be an EMAS filename, or EDNET device, or a jobname.

The other of the pair will refer to a file unit on a remote machine and will be defined as in Section 2.2, in the following format:

external system(external username,external userpass)external name

where external name is a filename, or device name, or job name on the remote machine depending on the MODE chosen (see Section 2.3).

An example of a single line command would be

TRANSFER file12,EX.PC(test,fred)ufile1,replace

the resulting request being for 'file12' on the local machine to be transferred to the 'test' user process at 'EX.PC' whose password for file transfer is 'fred', replacing an existing file called 'ufile1'.

There are three basic rules in this construction:

1) '(' and ')' must not appear in the external username or userpass.

2) ',' must not appear in the external userpass.

3) If any field is to be used with significant spaces preserved then the field must be enclosed by "" characters, i.e. "er 2"
If any transfer necessitates the breaking of rules 1 or 2 then the prompting (Section 3.2.1) interface should be used.

Many more examples can be found in Appendix 2.

For security reasons it is not always wise to type a password in a public environment and in these cases the password should be given as the single character '?'. As a result the password will be prompted for, and the response unechoed, after you have issued the completed command line. (See example 5 in Appendix 2.)

Use of the extended facilities available to file transfer as OPTIONS can be made in one of two ways:

1) Simply add a comma after the MODE on the command line and the 'Options:' prompting cycle will be entered when you issue the command line.
i.e. TRANSFER SOURCE, SINK, MODE,
Options:
(See Section 3.2.1 and example 4 in Appendix 2.)

2) You can add the options to the end of the command line as follows:
TRANSFER SOURCE, SINK, MODE,option,option,option.....
'option' takes one of two forms, simply 'key' if there is no parameter or 'key(parameter)' if a parameter is required for the option.

[Notes

1) Any parameter that is a text string and where case and/or spaces are to be preserved must be quoted, i.e. "string".

2) The first 2 characters of the Options 'key' are sufficient for recognition.

3) A comma at the end of the command line will still be interpreted as an indication that further options are to be prompted for.]

An example of this use is as follows:

```
TRANSFER jcl,ED.BUSH(test,jim)runout,job,failmail,special(out=lp34,time=12)
```

In this case the file 'jcl' locally is to be sent to ED.BUSH as job 'runout' to be run under the accreditation of user 'test' (password 'jim') with the Option FAILMAIL set locally and the string 'out=lp34,time=12' to be sent with the job to BUSH as a special option (that will be interpreted, in the case of EMAS, as Job scheduling information).

(For further examples see examples 7 & 8 in Appendix 2.)

3.3 The Monitoring and Control Interface

There are two commands associated with the monitoring and control of file transfers requests.

3.3.1 DELETEDOC

A command to delete a file transfer request from the local file transfer system or to abort and delete a file transfer request that is being progressed.

Command: DELETEDOC param

where 'param' is of the form Tn, Tn being the document number by which the request is known (for example, DELETEDOC T524).

3.3.2 TRANSFERS

A command that enables general enquiries to be made of the local file transfer system.

Command: TRANSFERS param [TRANSFERS ? gives help]

There are several possible parameters to this command as follows:

1) TRANSFERS with no parameter.
This will give the following three sets of information:

   * A list of all transfer requests outstanding for you and, if in progress, an indication of the state of the transfer.
   * The status of the local file transfer system.
   * The status (as understood by the local file transfer system) of all the external file transfer systems for which you have outstanding or currently active transfer requests.

2) TRANSFERS external system where 'external system' is the name of an external file transfer system, (for example TRANSFERS EX.PC). This will give the following three pieces of information:

   * A list of all file transfer requests outstanding for you for this particular external file transfer system.
   * The status of the local file transfer system.
   * A complete breakdown of the status of the external file transfer system in question together with statistics of transactions with the system.

   Note that this command can be issued regardless of whether or not you have any outstanding requests for the external system.

3) TRANSFERS ?key This is a more general form of the above. The '?' in '?key' indicates to the system that a general search on the external file transfer system database is required with a search key of value 'key'. Once in this mode any number of searches with any key can be undertaken. (For example TRANSFERS ?kent)

4) TRANSFERS .ALL
This facility allows you to look at the current activity of the local file transfer system. A status report on all the external file transfer systems for which transfers are in progress or outstanding will be given.

4. Responses from the File Transfer System

During the setting up of a transfer request (Section 3) an indication of the reason for any failure to queue the transfer request is given. Once the request has been queued then any further communication from the file transfer system to the user will be via MAIL (see the EMAS 2900 Electronic Mail document).

4.1 When a Transfer is Initiated by a User on the Local Machine

There are four circumstances in which the user will receive MAIL from the File Transfer System:

1) Negotiation of the transfer with the specified remote machine fails. In this case it is normal practice for the remote transfer system to indicate to the local transfer system the reason for the breakdown. This information is passed on to the user in the mail message and the local transfer system will attempt to give its own interpretation of the failure to the user. See Appendix 3 Section 1 for a list of the negotiation failure messages that may be provided by the local file transfer system to the initiating user. Appendix 6 is a technical overview of the negotiation attributes defined by the protocol NIFTP-B(80) and gives the capabilities of the EMAS implementation. The transfer request will be deleted in this case.

2) The negotiation of the file transfer with the remote machine is successful but the transfer of the actual file unit to or from the remote machine is unsuccessful. In this case the local file transfer system will give whatever information it can in the mail message, together with any information provided by the remote file transfer system. (See Appendix 3 Section 2 for a list of file unit transfer failure messages that may be provided in the mail message to the initiating user by the local file transfer system.) The transfer request will normally be deleted in this case.

3) The file transfer request is deleted by the local file transfer system for any other reason than 1 and 2 above; an explanation will be given in the mail message.

4) The file transfer is completed as requested.

Note: In all the above cases any information messages that are received by the local file transfer system from the remote file transfer system will be passed on to the initiating user in the mail message as follows:

'From <external system>: <message received>'

It is possible to suppress mail messages from the local file transfer system (See Section 3.2.1 'Options:' and Appendix 1).

4.2 When a Transfer is Initiated by a File Transfer System on a Remote Computer

In this case a mail message will only be generated when a successful transfer is performed, and will be sent to the user who was specified by the remote computer to be the 'owner' of the SOURCE or SINK concerned.

5. Transferring to and from the different EMAS 2900 & EMAS-3 file types

The main EMAS 2900/EMAS-3 transferable file types are as follows:

i) Character files
ii) Object files
iii) Data files
iv) Partitioned files (a special convenience file type with limited access facilities)
v) Groups and sub-groups (EMAS-3)

[For a full description of EMAS 2900 data structures see User Note 35.]

5.1 There are two groups to consider:

A) Those file types that can be transferred between EMAS and other (non-EMAS) external systems.

B) Those file types that can be transferred between two EMAS systems.

5.1.1

A) In this category only file types i) and iii) and files of types i) and iii) belonging to EMAS-3 groups or sub-groups can have unrestricted transfer capability. With file type iv) it is only possible to *initiate** the sending of an individual member character or data file to another system.

[* INITIATE means that you are issuing the command for file transfer of the file in question on the system on which that file resides.]

5.1.2

B) In this category file types i) and iii) can be transferred freely. File type ii) only has meaning if transferred between EMAS 2900 and EMAS 2900 or EMAS-3 and EMAS-3. File type iv) can be transferred from EMAS 2900 to EMAS-3, initiated on EMAS 2900 but *not* vice versa.

Subject to the foregoing description in this section all files that are members of an EMAS-3 group or sub-group can be transferred to and from EMAS-3 and EMAS-3 or EMAS 2900.

5.2 The relationship between EMAS data files and BINARY file transfer

'Binary' file transfer is a special form of file transfer defined in the file transfer protocol. This section defines the relationship between BINARY file transfer and EMAS file types. [This section only relates to transfers between EMAS and other non-EMAS systems. It is a definition of the capability and limitations of transfers of EMAS data files in 5.1.1 above.]

A data file (Format Unstructured, Variable record, Fixed record) on EMAS 2900 will be transmitted in a BINARY file transfer.

A File received by EMAS in a BINARY file transfer will be stored as an EMAS data file.

Preservation of record structures is defined as follows and is subject to note 2.

Transmitting from EMAS

Data file structure

F format	} record structure preserved
V format	} on transmissions.
U format	- lack of structure preserved on transmission.

Receiving from a non-EMAS system

Original format on external system

F format *	} will both be stored
V format	} as V format on EMAS.
U format	- will be stored in U format.

* if SPECIAL_OPTION attribute is given on a transfer initiated on an external system and it includes text FIXED then the file will be stored in F format.

Notes

1. The successful negotiation of a binary file transfer is subject to the acceptance by the external system of a BINARY_TRANSFER_WORD_SIZE of 8 bits. [The protocol default.]

2. The transmission of the internal record structure of binary files using the protocol NIFTP-B(80) is implied but not defined. The preservation of record structures defined above is therefore dependent on the implementation of the protocol on the external systems concerned.

General Point

Only data files where the 'records' are 'streams' of bytes (of 8 bits) can be regarded as 'safe' entities for File Transfer using the protocol NIFTP-B(80). The complexities of contextual significance within records moved from non-identical architectural environments cannot be preserved.

6. Availability of EMAS user files/file space/job environment to transfers initiated by a File Transfer System on a Remote Computer

6.1 'Read' Access

A user on a Remote Computer can be given 'read' access to all an EMAS user's files (that is he can transfer or 'drag' a file off EMAS to his own computer) if that EMAS user has disclosed his filetransfer password to the remote user in question. This is a new (March 1986) password that can be set using the EMAS command PASSWORD. [Note: It is initially set up to be the same as the background password but users requiring a higher degree of security should reset this password as soon as possible.] This password, together with the EMAS user's username and the particular filename must be provided by the remote user to initiate the transfer.

If a file is to be made available to be 'read' by users on remote computers and the local user wishes not to disclose the filetransfer password (thus giving general 'read' access) then it is sufficient for the file(s) in question to be permitted to FTRANS in read mode (i.e. the EMAS command PERMIT file,FTRANS,r) or to all users in read mode.

6.2 'Write' Access

If a user wishes to make files available to users on a Remote Computer for 'write' access (that is the user on the remote computer can create a new file or overwrite the contents of an existing file) then it is necessary that the EMAS user discloses his filetransfer password to the remote user in question. If the file in question is to be overwritten then it must be permitted to FTRANS in write mode (i.e. the EMAS command PERMIT file,ftrans,w) or to all users in write mode.

6.3 'Job' Access

If a user on a remote computer wishes to submit a job to run on an EMAS user process then the background password must be submitted.

Appendix 1

The options available to the file transfer system user

NOMAIL	No mail will be given when the transfer ends regardless of the reason for termination.
FAILMAIL	Mail will only be given if the transfer fails.
PRIORITY	Set the priority of the transfer. Defaults to standard.
SIZE	If the transfer is INcoming then here you can give an estimated upper bound on the size (in Kbytes) of the file. This will default to 100 Kbytes but it is in your interest to set it.
DELIVERY	Only relevant when the transfer is INto a device and sets the delivery information on the listing.
FORMS	As with DELIVERY, sets special forms requirement.
PASS	This sets an 'external file pass' for this transfer.
TERMINATE	This abandons the transfer under construction.
ANSI	Should only be set for transfers INto EMAS 2900 when the file in question has ANSI control characters and normal (i.e. ANSI not selected) transfer attempts have failed.
TXT BIN	The relevant option should only be used when the transfer is INto EMAS when the external system in question cannot distinguish between text and binary files on its local filestore prior to transmission (e.g. PRIME).
SPECIAL	This field can only be used for OUT going transfers and can be set by the user to any string of characters, the required value being specified by external site documentation.
.END	This terminates the *Options:* prompting.

Many more options will appear as the system develops and the user should check for the additional options by obtaining Help from the *Options:* prompt.

Appendix 2

Examples of file transfer requests initiated by a single line command

1.

TRANSFER FILE21,ED.BUSH(ERCC00,PASSWORD)NEWFILE2,MAKE
NIFTP-B(80) transfer queued, entry: T786

['FILE21' is to be transferred to the ED.BUSH and is to make a new file 'NEWFILE2' in the filestore of the user ERCC00 (with filetransfer pass 'PASSWORD')]

2.

TRANSFER LP15,UMRCC(:ZZTTRA,LFDEA)ERT1,REPLACE
NIFTP-B(80) transfer queued, entry: T245

[The local file 'LP15' is to be transferred to UMRCC to replace an existing file 'ERT1' in the filestore of user ':ZZTTRA' (with filetransfer password 'LFDEA')]

3.

TRANSFER UMRCC(:ZZTTRA,"ec W!")ERT1,LP15,output
NIFTP-B(80) transfer queued, entry: T123

[The file 'ERT1' in the filestore of user ':ZZTTRA' (with filetransfer password 'ec W!') at UMRCC is to be transferred to the RCO printer queue 'LP15']

4.

TRANSFER BHAM.DEC20(10,123,guest)ll6,gp11,output,
Options: FORMS
forms: 6
Options: .END
NIFTP-B(80) transfer queued, entry: T32

[The file 'll6' in the filestore of user '10,123' (with filetransfer password 'guest') at BHAM.DEC20 is to be added to the RCO plotter queue 'GP11' with special forms set to 6]

5.

TRANSFER TESTFILE,UKC.EMAS(ERCC33,?)NEWTEST,FILE
External User pass: (unechoed)
NIFTP-B(80) transfer queued, entry: 243

[The file 'TESTFILE' in the local filestore is to make a new file or replace an existing file 'NEWTEST' in the filestore of user ERCC33 (whose pass you have given with echo suppressed) at UKC]

6.

TRANSFER JCLFILE,RL.IB(PROC66,guest)job4,JOB
NIFTP-B(80) transfer queued, entry: T666

[The file 'JCLFILE' in the local filestore is to be run as a job at RL.IB under the accreditation given]

7.

TRANSFER JCLFILE,RL.IB(pritj91,qwerty)job5,job,failmail
NIFTP-B(80) transfer queued, entry: T45

[The file 'JCLFILE' in the local filestore is to be run as a job at RL.IB. The FAILMAIL option is also to be set]

8.

TRANSFER ARFC.GCRI(gmann,?)outfile,lp23,out,fa,forms(7),
External User Pass: (unechoed)
Options: pass
File Pass: (unechoed)
Options: .end
NIFTP-B(80) transfer queued, entry: T356

[The file 'outfile' at AFRC.GCRI is to be queued for device 'lp23' locally and the user password is to be prompted for. Also the options FAILMAIL and FORMS are to be set and further options to be prompted for (in this case to set the External File Password without echoing)]

Appendix 3

Mail message Response List

Contents of mail messages from the local file transfer system to an initiating user that are the local file transfer system's interpretation of failure.

Section 1

External Name is rejected

External Username is rejected

External User Pass is rejected

External Device Name is rejected

Transfer is too large and is rejected

External Account Name is rejected

External Account Pass is rejected

External File Pass is rejected

External Job Scheduling is rejected

All of these messages may be qualified by additional information. If no reason can be gleaned of the remote transfer system then the local transfer system is confused and responds:

Negotiation failure

In this case consult the advisory services with details.

Section 2

Local Transmitter failure

Local Receiver failure

Receiver failure at <external system>

Transmitter failure at <external system>

Transfer fails after repeated attempts

If these messages are given without qualification then consult the advisory services with the transfer details.

Appendix 4

Submission of jobs to EMAS from External File Transfer Systems

If you wish to submit a job to EMAS then the following rules apply. [Examples given are of submission of jobs by the EMAS File Transfer System from local EMAS to an External EMAS.]

If the transfer is identified as a job by EMAS and it is not qualified by accompanying special-options information then the default job scheduling parameters for batch work will be assumed.

i.e. TRANSFER TEST,ED.BUSH(ERCC97,PASS)TESTJOB,JOB

If the default scheduling parameters are not sufficient then the required parameters must be submitted to the special-options field [available on the EMAS File Transfer System as an OPTION (See Appendix 1)]

i.e. TRANSFER TEST,ED.BUSH(ERCC97,PASS)TESTJOB,JOB,

options: SP
value: TIME=300, OUT=LP39
options: .END

or TRANSFER TEST,ED.BUSH(ERCC97,PASS)TESTJOB,JOB,SP(TIME=300,OUT=LP39)

Note that the scheduling parameters that can be set in the Special Options Field are defined in EMAS 2900 User's Guide. The following scheduling parameters should not be set in the Special Options Field:

'USER=', 'PASS=', NAME=', as these are taken directly from the transfer information.

Appendix 5

Examples of responses from the interface command TRANSFERS

Note: see definitions at the end of this Appendix for explanations of headings and entries.

Example 1

```
Command: transfers

Doc_ Name_______ Submitted__ State_____________ Ext. System____ Ahead:Docs / Nkb
T948 TRL........ 24/07 14.43 Transferring with ......ED.ERCVAX ..64 Kb Sent
T950 M.......... 24/07 14.44 Queued for....... ......ED.ERCVAX .........0 ....0
T952 FTRAN_FTCON 24/07 14.45 Queued for....... ........ED.EDEE .......174 ..717

*Local Transfer Service is Open, Limited to 1000kb  [Records start: 06/07 15.21]

Ext. System____ Last Reply__ Last Call__ Line NOTES
ED.ERCVAX......  24/07 14.44 ...........    3  Currently active for you
ED.EDEE........  23/07 01.28 ...........    -  179 Calls since last reply.
                                           2  Calling for MAIL.
```

Example 2

```
Command: TRANSFERS ED.CSTVAX
You have no FILE TRANSFER requests for ED.CSTVAX

*Local Transfer Service is Open, Limited to 1000kb  [Records start: 06/07 15.21]

ED.CSTVAX :    Dept. of Comp. Science VAX (UNIX)

Full Name:     UK.AC.EDINBURGH.CSTVAX

Primary TS address : 15000036
Accepts transfers up to 5000kb; maximum of 1 concurrent transfer(s).
Transaction Summary: {Last 1032kb transferred average 106 bytes/second}
A) with ED.CSTVAX as respondent to Local Transfer Requests
    There have been 29 transfers ( 29 were MAIL )
    Total of 1763 Kilobytes transferred (  60.8 Kb/transfer )

B) with Local Transfer Service as respondent to Transfer requests from ED.CSTVAX
    Last serviced call from ED.CSTVAX was at 23/07 14.05
    There have been 50 transfers ( 3 were MAIL )
    Total of 7322 Kilobytes transferred (  146.4 Kb/transfer )

Ext. System____ Last Reply__ Last Call__ Line NOTES
ED.CSTVAX.....  24/07 04.35 ...........    -  IDLE, no transfer requests.
```

Example 3

```
Command: transfers .all

*Local Transfer Service is Open, Limited to 1000kb  [Records start: 06/07 15.21]

Ext. System____ Last Reply__ Last Call__ Line NOTES
ED.ERCVAX......  24/07 15.12 ..........    2  Currently active for you
ED.FSTORE......  24/07 15.07 ..........    4  Currently active for another
user.
ED.EDEE........  23/07 01.28 24/07 15.03    -  181 Calls since last reply.
                                           -  Will re-call within 6 mins.
BHAM.DEC20.....  24/07 12.02 ..........    3  External call active for a user.
```

Definitions of headings and entries

1) The heading:

```
Doc_ Name_______ Submitted__ State___________ Ext. System____ Ahead:Docs / Nkb
```

Doc	: The document number by which the transfer request is known
Name	: The local file unit name in the SOURCE or SINK.
Submitted	: The time when the request was submitted.
State	: The current state of the request. This can be one of:
	Queued - awaiting action
	Calling - trying to contact the ext. system
	Call Closing with - terminating the contact.
	Transferring with - The transfer is going ahead.
	Deferred on size - The request is too large for now.
Ext. System	: The External System this request refers to.
Ahead	: This will be one of the following:
	a) If queued then the number of requests ahead of this request for the particular ext. system together with the total kilobytes of these requests.
	b) If Transferring then the no. of kilobytes transferred at that time is given.
	c) If deferred then the size of the transfer request is given.

2) The local system status line:

```
Local Transfer Service is Open, Limited to 1000kb  [Records start: 06/07 15.21]
```

* The service is either OPEN or CLOSED.
* The limit is the maximum transfer request that will be serviced by the local file transfer system at this particular moment (in kilobytes)
* The 'Records start' is the starting time of the gathered statistics.
* ALL LINES ARE BUSY may replace the 'Records start' message and this occurs when the full capacity of the local system is being utilised.

3) The heading:

```
Ext. System____ Last Reply__ Last Call__ Line NOTES
```

Last Reply : This is the date and time that the ext. system in question last responded to a call for file (or MAIL) transfer from the local file transfer system. If the value 'No record' is specified then there has been no response since the 'records start' time given.

Last Call : This is only given when a call is not under way at the moment. It is the time when the local file transfer system last tried to contact the ext. system.

Line : If the local file transfer system is calling or transferring with the ext. system then the 'line' is the local file transfer system line that is servicing the call.

NOTES : This is where one or a series of lines of information is given.

* 'Calling for ....' : this line is calling the Ext. system.
* 'Currently active for ...' : this line is transferring data with the Ext. system.
* 'External call active for ...' : a transfer initiated by the Ext. system is in progress with the local system.
* 'n calls since last response' : the local system has attempted to contact the Ext. system n times since the last response time given.
  This message will appear when a call is being made or together with the following message.
* 'will re-call within x minutes' : a prediction of when the local system will next try to contact the Ext. system.

4) The statement:

```
Last serviced call from .....
```

This is the date and time that the local file transfer system last received and responded to an attempt by the external file transfer system to initiate a file transfer.

Appendix 6

Capabilities of EMAS implementation of the standard protocol NIFTP-B(80)

This Appendix is for information only and should be skipped unless an understanding of the protocol mapping is required or consultation with a remote advisory service requires details of this nature. [The terminology in which this appendix is expressed is that of the protocol definition of which a copy will be available for consultation in the Advisory service.]

Note that the capabilities of the file transfer system are being expanded and the exclusion of any facility at present is only an indication that the facility has yet to be implemented.

The implementation can in theory handle any number of simultaneous transactions but in practice twenty-five is an acceptable upper limit. This can be increased at any time.

The protocol defines a series of ATTRIBUTES that are the basis of inter-system negotiation of transfers between the initiating system (known in protocol terms as the "P process") and the responding system (known as the "Q process"). The capabilities of the EMAS file transfer system are defined in terms of these attributes as follows:

Attributes sent by the EMAS File Transfer System as a P process

00 Protocol_Identification	[0100] NIFTP-B(80) Version 4.0
01 Mode_of_access	As specified by user from the following [0001] MAKE ONLY [0002] REPLACE ONLY [0003] MAKE OR REPLACE [2001] TAKE JOB INPUT [4001] TAKE JOB OUTPUT [8002] READ ONLY [C000] GIVE JOB OUTPUT
02 Text_transfer_code	LE MONITOR [0009] , IA5 or Private Code if P receiving or P sending text EQ [0008] if P is sending Binary
03 Text_formatting	If P is Sending text then LE MONITOR [0081] If P is Receiving then LE MONITOR [0083] or EQ [0002]
05 Max_transfer_rec_size	LE MONITOR [FFFF] if P receiving or P sending text EQ [n] if P sending binary, n being max record.
09 Private_tran_code_name	[INTER EMAS]
0D Minimum_timeout	[0258]

0F State_of_transfer	None on the SFT but during transfer as follows: [0000] Viable [1001] to [1003] reflected on STOP [2000] Satisfactory termination on STOP [3010] Aborted, no retry possible on STOP [3011] Aborted, retry possible on STOP. This is, without resumes, to be attempt again at beginning in new transfer. EMAS will try three times in this case.
20 Data_type	EQ [0001] if P sending text EQ [0002] if P sending binary LE [0003] if P receiving.
24 Binary_record_ size	EQ [0008] if P sending binary or P to receive.
40 Filename 42 Username 44 Username_password 45 File_password 50 Output_device_type 51 Output_device_qualifier	| | as specified | by the | user | |
60 File_size	An estimate if sending or MONITOR if receiving.
71 Information_message	A system greeting on SFT otherwise transfer problem details on STOP.
80 Special_options	A string as specified by the user.

Attributes negotiated or sent by EMAS as a Q process

00 Protocol_ident	[01xx] only acceptable (NIFTP-B(80))
01 Mode_of_access	Q will accept same set as defined for P process with the exception of [C001]. In the case of [0003] the chosen primitive is monitored back to the P process.
02 Text_transfer_code	If private_code [INTER EMAS] offered then this is automatically accepted otherwise only IA5 accepted.
03 Text_formatting	If text transfer negotiated, the following are supported chosen in the order given: [0001] EOR implies NL action. No other significance. [0002] ANSI control, for transfers INto EMAS only. [0080] No significance implied.
04 Binary_format	As default, wordsize 8 only supported.
05 Max_tran_rec_size	LE [FFFF] acceptable
06 Transmission_limit	LE [FFFF] acceptable
07 Data_estimate	Not implemented

08 Transfer_identifier	Not implemented
09 Private_tran_code_name	By mutual agreement if text_transfer_code includes [0008]
0A Acknowledgement_window	Not implemented
0B Initial_restart_mark	Will reply with [0000] if MONITOR received.
0D Minimum_timeout	Will accept as requested but may not act on timeout in all circumstances.
0E Facilities	Only [0000] acceptable
0F State_of_transfer	Will respond with one of the following on RPOS/RNEG: [0000] viable [1001] rejected, see information message [1002] rejected, unacceptable attribute setting [1003] transfer acceptable but deferred and on STOPACK with [2000] Satisfactory termination [3010] or [3011] chosen with respect to circumstances of the failure and as defined above.
20 Data_type	[0001] or [0002] acceptable
21 Delimiter_preservation	Not implemented
22 Text_storage_code	Not implemented
23 Horizontal_tabs	Not implemented (tab characters preserved)
24 Binary_word_size	[0008] only supported
25 Max_storage_rec_size	Not implemented
26 Page_width	Not implemented
27 Page_length	Not implemented
29 Private_storage_code_name	Not implemented
40 Filename	This is required except with mode Take_job_output
42 Username	Always required
44 Username_password	See Section 6.
45 File_password	Ignored
4A Account	Ignored
4B Account_password	Ignored
50 Output_device_type	Required for Take_job_output mode
51 Output_device_qualifier	as above

60 File_size	Required if Q is to receive file
70 Action_message	Not implemented
71 Information_message	general information given for negotiation failure on RNEG and for transfer failure on STOPACK.
80 Special_options	will accept any string of characters (restricted to 39 characters.)

Addressing the ERCC EMAS systems:

ED.EMAS	: PSS	234231354354.(DEMO,DEMO).EMAS.FTP
	: JANET	000015000001.FTP
ED.BUSH	: PSS	234231354354.(DEMO,DEMO).BUSH.FTP
	: JANET	000015000003.FTP
ED.EMAS-A	: PSS	234231354354.(DEMO,DEMO).EMAS-A.FTP
	: JANET	000015000043.FTP

For MAIL in all cases append .MAIL to TS address.

[All EDNET hosts are registered fully on the NRS.]