

**NET — An Inter-Computer File
Transfer Command**

R. D. Burris

MASTER

ORNL/CSD/TM-56

Contract No. W-7405 eng 26

COMPUTER SCIENCES DIVISION

NET — AN INTER-COMPUTER FILE TRANSFER COMMAND

R. D. Burris

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

Date Published - May, 1978

NOTICE

This document contains information of a preliminary nature. It is subject to revision or correction and therefore does not represent a final report.

UNION CARBIDE CORPORATION, NUCLEAR DIVISION
Operating the
Oak Ridge Gaseous Diffusion Plant • Oak Ridge National Laboratory
Oak Ridge Y-12 Plant • Paducah Gaseous Diffusion Plant
for the
DEPARTMENT OF ENERGY

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

TABLE OF CONTENTS

ACKNOWLEDGMENTS	v
ABSTRACT	1
1. INTRODUCTION	1
1.1 General	1
1.2 Purpose of This Document	3
1.3 Parameters for Program Design	3
1.4 Command Format	4
1.5 Command Action	5
2. COMMAND FIELD OPTIONS	8
2.1 Node	8
2.2 FILESPEC	9
2.2.1 Multiple File Specifications	9
2.2.2 Wildcard Specifications	10
2.2.3 File Specification Fields	12
2.2.3.1 Device	13
2.2.3.2 File Name, Extension, Project, and Programmer Numbers	14
2.2.3.3 Switches	15
3. NODE - SPECIFIC INFORMATION	17
3.1 RSX	17
3.2 A7600 and DEC-10's in the HFE Network	18
3.3 FED and X10	18
3.4 IBM Nodes	19
4. EXAMPLES	20
4.1 Transfers into the HFE Network	20
4.2 Transfers Between the CSD and FED DEC-10's	20
4.3 Use of the RSX Node	21
4.4 File Retrieval Requests	21
4.5 Transfers Involving IBM Nodes	22
4.6 Unsupported Options	22
4.6.1 Third Party Transfers	22
4.6.2 Same Node on Both Sides of the Command	23
4.6.3 Retrieval from Livermore-Network Nodes	24
4.6.4 Wildcard Retrieval Requests	24

BLANK PAGE

5. CONCLUSION	26
APPENDIX A. Net Command Help File	27
APPENDIX B. Implementation of the NET Command	33

ACKNOWLEDGMENTS

This work was done to support personnel and operations of the Fusion Energy Division and was funded by them. Discussions with Charles Kemper and Reid Gryder contributed heavily to the system design. I am pleased to acknowledge the efforts of Janice Hughes in the preparation of this manuscript.

NET - AN INTER-COMPUTER FILE TRANSFER COMMAND

ABSTRACT

The NET command was defined and supported in order to facilitate file transfer between computers. Among the goals of the implementation were greatest possible ease of use, maximum power (i.e., support of a diversity of equipment and operations), and protection of the operating system.

1. INTRODUCTION

1.1 General

Personnel of the Fusion Engineering Division (FED) of Oak Ridge National Laboratory (ORNL) have access to several computer networks, including

1. The Magnetic Fusion Energy (MFE) Network, consisting of a Control Data Corporation (CDC) 7600 and several Digital Equipment Corporation (DEC) DEC-System 10's across the nation,
2. FED's own data gathering network, including a PDP 11/45, three PDP 12's, five PDP 8's, a growing number of PDP 11/40's, and soon an Interdata 8/32,
3. The Union Carbide Corporation, Nuclear Division's Computer Sciences Division (CSD) network, consisting of a DEC-System 10, IBM 360 computers, (models 50, 75, 91, and 195), IBM 370/155, and many smaller computers scattered around the country.

Major elements of these networks are shown in Figure 1.

BLANK PAGE

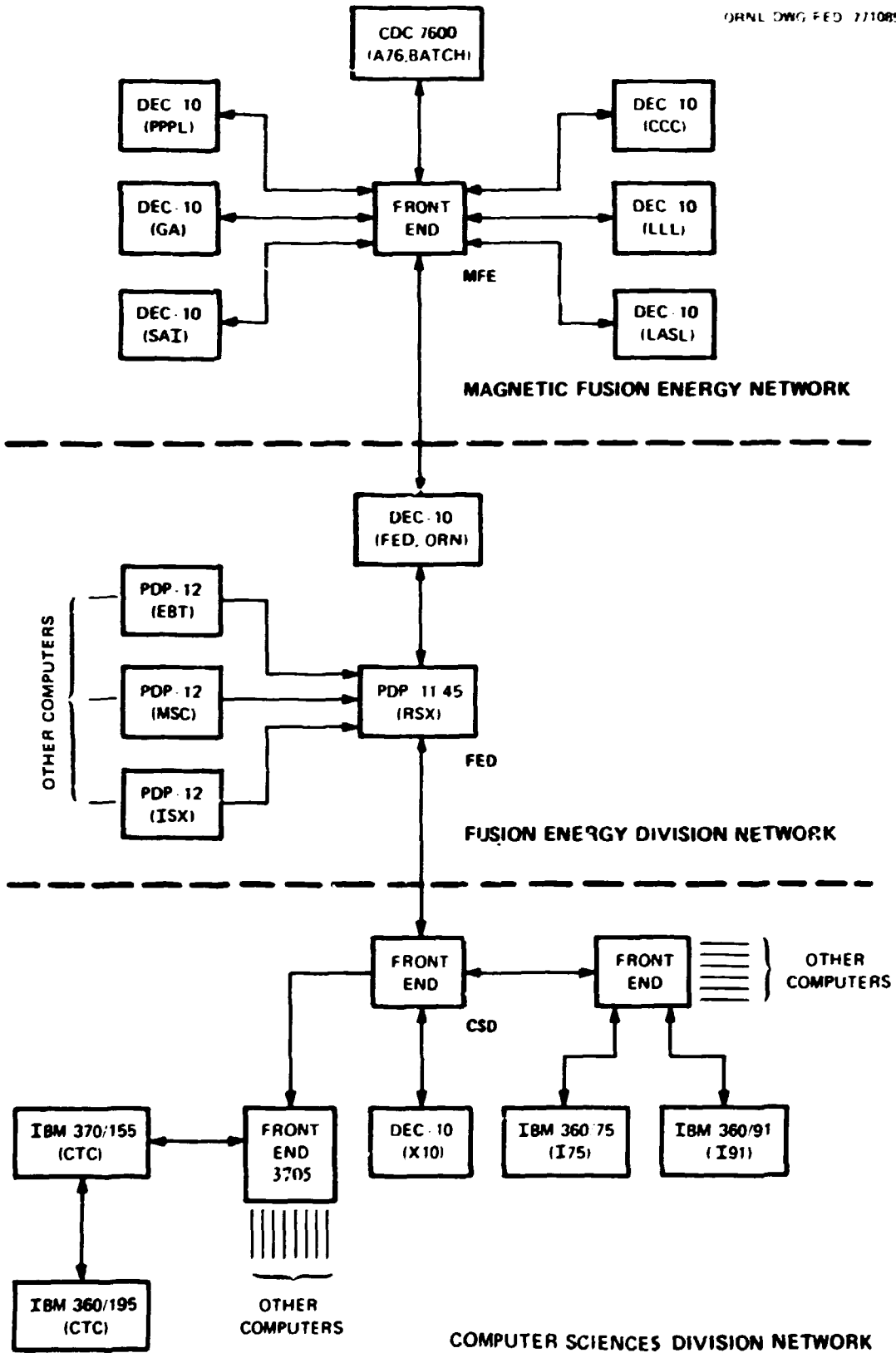


Figure 1. Computer Networks Used by Fusion Energy Division

FED users working on several of these computers are burdened by differing requirements for executing jobs and with the need to keep current copies of their material on each machine. The NET command was developed to make this burden lighter by providing the means of transferring files between one computer and another using a single standard command format. It has been implemented on the DEC-System 10's at FED and CSD.

1.2 Purpose of This Document

The bulk of this document serves as a reference to and description of the NET command, its fields, and their options and as such contains more information than a novice user would desire. Appendix A contains the information useful to a novice, such as general information about the command format and examples of its use in fundamental operations. The user may obtain a copy of this information by typing "HELP NET" on a terminal connected to a computer supporting this command.

1.3 Parameters for Program Design

The parameters chosen for the design of the NET command and its processor were the following:

1. The NET command should permit access to the computers most used by FED personnel.
2. It should be easy to use and should have a single syntactical structure regardless of the computers or devices involved in file transfer.

3. The NET command should provide as much flexibility to the user as possible. Such flexibility might include one of several input or output devices, remote printing, and file retrieval.
4. The operating system of all computers must be protected against naive or careless users.

1.4 Command Format

Since most of the computers used by PED personnel are made by DEC, the command format chosen was the DEC-style string, i.e.,

DESTINATION=SOURCE

where DESTINATION and SOURCE refer to file specifications (also known as filespecs). Since the NET command was to be installed on the DEC-10's at PED and CSD, the DEC-10 version of file specification was chosen as follows:

DEVICE:FILENAME.EXTENSION[PROJ,PROG]/SWITCH:VALUE

To permit the specification of computers between which the file transfer would occur, the field

NODE_

was included on both sides of the equal sign, i.e.,

NET NODE_FILESPEC=NODE_FILESPEC

where the delimiter of the node is the underscore or the backarrow (which are equivalent forms of the same character provided on different terminals or output devices). The NET command processor translates that portion of the command relevant to a remote computer to the syntax recognized by

that computer. The resultant command string is typed on the user's teletype.

1.5 Command Action

The program developed to support this command is an interface between the user and other programs whose purpose is more directly to control communication hardware. On DEC-10's on which the command is supported, there is a program (called a spooler) whose function is to interface data and hardware without the user having to wait for the completion of the operation. For files to be transferred between Oak Ridge nodes, the spooler (RATSPL) was designed to support the NET command.

Files may be sent to MPE nodes either via the NET command or by utilizing the program NETOUT (described in the document DECNETOUT, available from MPE network personnel). NETOUT was designed to interface to a MPE-supplied spooler which is not compatible with the NET command. Consequently NETOUT was modified to accept transfer requests either from a teletype or from the NET command processor.

See Figure 2 for a general flow diagram of the NET command processing.

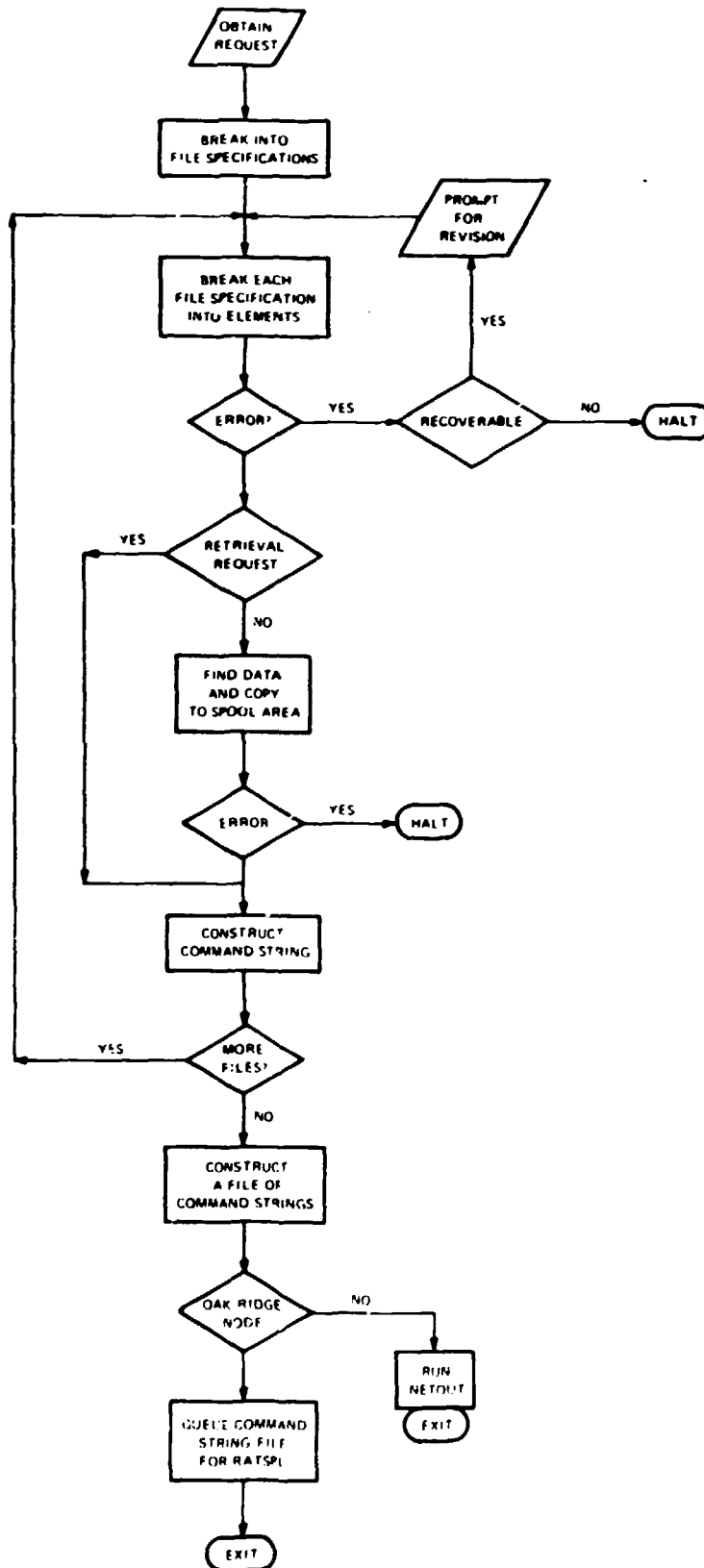


Figure 2. General Flow of NET Command Processing

The NET command supports file retrieval requests as well as transmission requests, wherein the destination node is the node to which the user is logically connected. This capability is provided by sending the command string itself, without data, to the remote node where it is queued for RATSPL processing as if a user attached to that node had requested the transfer. (Retrieval from MPE nodes is not supported by NETOUT.)

In summary, the NET command processor performs the following tasks:

1. Translates the user's request into a form suitable for RATSPL or NETOUT.
2. Copies the data to be transferred (if any) to a spooling area.
3. Creates a file containing the request(s) to be processed by RATSPL or NETOUT.
4. Causes RATSPL or NETOUT to operate upon the file created above.

Upon completion of the processing of the NET command, the user may delete transmitted files since copies have been made in an area known to the system.

2. COMMAND FIELD OPTIONS

2.1 Node

The following nodes are supported:

NETWORK	SITE	NODE NAMES	MACHINE
PED	Oak Ridge	ORN, ORNL, PED	DEC-10
	Y-12	RSX	PDP 11/45
		MSC	PDP-12
		ISY	PDP-12
		EBT	PDP-12
NPE	Lawrence Livermore Laboratory	A7600, A76 BATCH	CDC 7600 user area CDC 7600 batch processor
		LLL CCC	DEC-10 (H-division) DEC-10 (Network machine)
		Princeton Plasma Physics Laboratory	PPP, PPL, PPPL DEC-10
	General Atomics	GA	DEC-10
	Los Alamos Laboratory	LSL, LASL	DEC-10
	Science Applications Incorporated	SAI	DEC-10
	CSD	Oak Ridge Y-10	X10
I75			IBM 360/75
I91			IBM 360/91
IBM			either of above
Oak Ridge K-25		CTC	IBM 360/195 IBM 370/155

The PED 11/45 (RSX) is used as a relay device between the PED and CSD equipment, but it is also useful for its impact printer and as a store-and-forward device for data gathered in three major experiments:

1. MSC (Magnetics and Superconductivity)
2. ISX (Impurities Study Experiment)
3. EBT (Elmo Bumpy Torus)

The default node is that node to which the user is logically connected.

2.2 FILESPEC

2.2.1 Multiple File Specifications

The destination and source sides of the command may each contain several filespecs. The purpose of this feature is to minimize the typing that the user need perform. In the event that the same number of files are specified on each side of the equal sign, the specifications match one-for-one.

NET NODE_A,B,C=NODE_A,F,G

is functionally equivalent to

NET NODE_A=NODE_A

NET NODE_B=NODE_F

NET NODE_C=NODE_G

If the source side has more specifications than the destination side, the specification of the missing destination files is set equal to the corresponding source filespec.

NET NODE_A=NODE_B,C,D

is equivalent to


```
NET NODE_A=NODE_B
```

```
NET NODE_C=NODE_C
```

```
NET NODE_D=NODE_D
```

If the destination side contains more file specifications than the source side, those destination entries without corresponding source specifications are ignored.

2.2.2 Wildcard Specifications

On DEC-10's a facility known as "wildcard specification" has been provided to several user-available commands. Without this capability, should users desire to find all the files in a certain area whose names begin with the characters "NAM", they would either have to list all entries in that area or to inquire about the existence of each possible combination of characters, the first three of which are "NAM". With wildcarding, however, users may inquire for all files named "NAM???", and the program doing the searching will treat all files with any character where the question marks appear, including null, as a match for the request. If the names of all files with extensions of ".MAC" are desired, the user may request "??????.MAC" or, equivalently, "*.MAC".

The NET command supports this wildcard feature by permitting wildcard specifications in the file name, extension, project number, and programmer number fields. Wildcards may appear in one or more entries of a

multiple-file transfer specification. Examples of its invocation follow: (Assume that the directory in use contains files with the name "A" and only the following extensions: AEF, BEF, CEF.)

```
NET NODE_A.?BC=NODE_A.?EF
```

will produce the same results as

```
NET NODE_A.AEC=NODE_A.AEF
```

```
NET NODE_A.PBC=NODE_A.BEF
```

```
NET NODE_A.CBC=NODE_A.CEF
```

To rename files at their destination, the user might specify

```
NET NODE_X.*=NODE_A.*
```

instead of

```
NET NODE_X.AEF=NODE_A.AEF
```

```
NET NODE_X.BEF=NODE_A.BEF
```

```
NET NODE_X.CEF=NODE_A.CEF
```

When scanning the string supplied by the user, the use of "*" as a file name is equivalent to "??????", i.e., six wildcard operators. The use of "*" as an extension is equivalent to "???", or three wildcard operators. The logic and implementation of wildcard operators in the DEC software prohibits the specification of a different number of wildcard operators on the two sides of a wildcard request. Accordingly, the specification

```
NET RSX_A.*=*.A
```

will fail, since there are three wildcard specifiers on the

destination side of the command and six on the source side.

The specification

```
NET RSY_A.*=???.A
```

will work.

The user may place the "?" operator anywhere it is legal on the source side and anywhere it is legal on the destination side. The character matched by the wildcard on the source side will replace the wildcard character on the destination side. This could lead to illegal constructions should the user place a wildcard in the destination PPN and in the source filename field.

If no destination filespec is specified for some source filespec, its wildcard characteristics are copied along with the rest of the specification.

```
NET NODE_=NODE_A.*
```

would be the equivalent of

```
NET NODE_A.AEP=NODE_A.AEP
```

```
NET NODE_A.BEP=NODE_A.BEP
```

```
NET NODE_A.CEP=NODE_A.CEP
```

2.2.3 File Specification Fields

The file specification may contain the following fields:

1. Device, delimited by ":"
2. File name

3. Extension, preceded by "."
4. Directory (also called PPN), consisting of project and programmer numbers separated by a comma and enclosed by "[" and "]"
5. Switches, preceded by "/" and separated from their values, if any, by ":"

2.2.3.1 Device. File transmission may involve various devices as source or destination. On DEC-10's the device field may designate

1. A physical device, such as MTA: for magnetic tape
2. A logical set of disk devices known as a file structure, such as DSKB:
3. All file structures available to a user, via DSK:
4. A specific area of a file structure, such as HLP:, the area containing HELP files (these devices being known as pseudodevices)
5. A queue, such as INP: (batch)

The NET command supports the following source devices:

NODE	LEGAL DEVICES
PED, X-10	DSK:, DSKxx:, appropriate pseudodevices
Any other nodes	Net command not supported

The following devices are supported as output devices:

NODE	LEGAL DEVICES
PED	DSF:, DSKxx:, LPT:, RJO:, NTO:, RAT:, appropriate pseudodevices
X10	DSK:, DSKxx:, LPT:, RAT:, I91:, I75:, IBH:, CTC:, appropriate pseudodevices
IBM nodes	Batch only
RSX	SY:, LP:, DSK:, LPT:, DKx:
EBT, HSC, ONK	Receiving software does not exist
A7600	User area
All other SPE Network nodes	DSK:

The default device is disk; however, that device is spelled at the relevant node.

2.2.3.2 File Name, Extension, Project, and Programmer Numbers. These are all specified in the standard DEC-10 format. The file name may be from one through six characters long. The extension may be from zero through three characters in length and delimited from the file name by a ".". The project and programmer numbers are octal and from one through six digits long, delimited from each other by a "," and enclosed by "[" and "]".

There is no capability at any node to correlate a given PPN with the PPN at a different node. While using the NET command, the user must specify the PPN to be used at the remote node. Failure to do so will cause the user to be prompted for that PPN.

The default destination file name is the file name specified in the corresponding field of the source specification. The source file name must be specified.

The default extension is null, on each side.

The default local node PPN is the PPN under which the user is operating.

2.2.3.3 Switches. Switches provide processing information to the destination node. To specify a switch, the character "/" is typed, followed by enough characters of the switch name to make the request unique. For instance, "/APTER", "/APTE", "/APT", and "/AP" are equivalent. If switches are specified before (to the left of) one or more filespecs, their values remain unchanged for all subsequent filespecs on the side upon which they appear until they are changed. The device and the directory are also treated as sticky switches.

The default switch value is none, generally. More information regarding defaults is given with the switch descriptions.

The AFTER switch controls the time after which the queue entry is to be processed. It affects transmission to all but the HPE nodes. Various formats for entering the date and time are supported:

1. Day in week name of a day of the week
 or an abbreviation
 /AFTER:THURSDAY
2. Julian date NNND
 /AFTER:213D
3. (MONTH-DAY(-YEAR):) HOUR(:MINUTE(:SECOND))
 /AFTER:13:15 after 1315 of this day
 /AFTER:13:15:20 20 seconds later than above
 /AFTER:JAN-27-77 after Jan. 27, 1977

 /AFTER:JAN-4-78:5:00:15
 15 seconds after 5 a.m. on
 Jan. 4 of 1978
 /AFTER:3-5 after March 5 of
 1977
 /AFTER:3-5-7 as above
 Note: The month may be 1-12
 or mnemonic. The year may be
 the last digit of the year,
 the last two digits of the
 year, or the entire year.
4. (day-in-month (- year):) time as above
 /AFTER: 27-MARCH-1977 after March 27, 1977

3. NONP-SPECIFIC INFORMATION

3.1 RSX

The **NET** command translates devices unknown to the 11/45, namely DSK: and LPT:, to the 11/45 equivalents SY: and LP:.

SWITCHES

/VPRSN	Version number of a file to be requested.
/ASCII	The following is an ASCII file.
/FAKASCII	The following is a file made to look like ASCII.
/LINE NUMBERS	The following file has line numbers in it.
/EBCDIC	The following file is in EBCDIC.
/BINARY	The following file may contain any combination of bits.
/FLOATINGPOINT	The following file contains floating-point numbers.
/TASKI	The data being transmitted is a task to be performed.
/TASKN	The command string names a task to be executed.
/AFTER	Begin transmitting this request after the specified time.

The default is /AS.

Examples

Specifying **NET RSX_LPT:=A.HAC**
 Produces **PSX_LP:A.HAC=ORW_DSK:A.7AC[200,200]**

Specifying **NET RSX_DX0:A.B[1,4]/ASCII=ORW_A.BCD[200,200]**
 Produces **PSX_DX0:[1,4]A.B/AS=ORW_A.BCD[200,200]**

3.2 A7600 and DEC-10's in the NPP Network

The NPP network software is all written by Livermore personnel and distributed to the User Service Center (USC) computers of which one is the PED DEC-10. The software as distributed includes software for transmission to and from the 7600 computer and a user interface program called NETOUT, which processes a user's request, translates the file to some form, and queues the result for transmission to the 7600.

Rather than copy the capabilities of the NETOUT program into the NET command processor, NETOUT was modified to accept input from the NET processor. The NET command passes the command string to NETOUT without inspection, so all capabilities of NETOUT are supported. At X-10 NETOUT was further modified to send files via the 11/45 to the PED-10, from which they are sent to Livermore. (See Figure 1.)

3.3 PED and X-10

There are no restrictions on transfers between the PED and X-10 nodes. No switches are defined. The data are not inspected, so any type of data may be sent. The fact of transmission is transparent to the user - the data upon arrival are identical to the data before transmission.

3.4 IBM Nodes

A user on either Oak Ridge DEC-10 may execute the system program `SUBMIT` via `R SUBMIT` to cause a job to be run on IBM equipment. Users on the DEC-10 will have their job routed through the 11/45 to X-10 and then requested for IBM. Files may be sent directly to IBM using an IBM node, but the file must already be in EBCDIC and otherwise suitable for transmission spoolers. No translating or data modification is performed by the `WET` command processor or `RATSPL`.

4. EXAMPLES

4.1 Transfers into the HPE Network

```

NET A76_/USPR:2314=A.1
    put A.1 into user area 2314 on the 7600

NET A7600_/USPR:2314=A.1
    the same

NET BATCH_=A.1
    put A.1 into the 7600 batch queue

NET A76_/BAT=A.1
    the same

NET CCC_X.*[200,145]=A.*
    send all files with the name A in the user's area
    and send them to CCC, area [200,145] and rename to
    X. (whatever).

NET CCC_ABC.D[25,241]/N/C/B/BOX:DENT=QED.PPP[200,1466]
    transfer QED.PPP[200,1466] on the local DEC-10 to
    the CCC DEC-10, rename to ABC.D[25,241], and specify
    BOX number DENT, U., C., and B.

```

4.2 Transfers Between the CSD and FED DEC-10's

The following examples assume the user is logged into the FED-10.

```

NET X10_Q.R[200,111]=AAB.C[200,1577]
    send file AAB.C in area [200,1577] to X-10, putting
    it in area [200,111] under the name Q.R

NET X10_X.*[200,143]=A.*[200,21455]
    send all files named A (any extension) in
    [200,21455] to X-10. Rename to X.(whatever) and put
    in PPN [200,143]

NET X10_[200,143]X.1,X.2,X.3=[200,21455]A.1,A.2,A.3
    does the same as the previous command if the only
    three files with name A are A.1, A.2, A.3

```

The following examples assume the user is logged in to X-10.

NET ORN_Q.R[200,111]=AAB.C[200,1577]
 send file AAB.C in area [200,1577] to ORN, putting it in area [200,111] under the name Q.R. Note that this request is identical to the first one in this section except the destination node has been changed. The only difference between commands entered by a user logged into different DEC-10 nodes is the node name.

4.3 Use of the RSX Node

The following commands may be entered by users on either DEC-10 supporting the NET command.

NET RSX_LPT:=COMPAN.MAC
 print the file COMPAN.MAC in the user's area on the PED 11/45 impact printer

NET RSX_LP:=COMPAN.MAC
 the same

NET RSX_DSK:ABC.D[1,22]=COMPAN.MAC
 move file COMPAN.MAC from the user's area to area [1,22] on the 11/45, giving it the name ABC.D

NET RSX_ABC.D[1,22]=COMPAN.MAC
 the same

NET RSX_DK0:ABC.D[22,44]=COMPAN.MAC
 move the same file to disk DK0 on the 11/45, naming it ABC.D and putting it in area [22,44]

NET RSX_LP:=COMPP.P/EB
 print COMPP.P on the 11/45 impact printer but treat the file as EBCDIC, not ASCII

4.4 File Retrieval Requests

The following assume a user is logged into the PED DEC-10.

NET PED_ABC.DD[200,111]=X10_QED.DEQ[11,337]
 retrieve the file QED.DEQ in [11,337] from X-10 and put it in [200,111] on this machine under the name ABC.DD. Note that the source node must be specified

and that PPH's on both sides must be specified. Furthermore, there is an implementation restriction against the use of wildcard characters in retrieval requests which will be discussed presently.

NET PED_QED.DEQ[100,200]=X10_QED.DEQ[11,337]
 retrieve the file QED.DEQ from [11,337] and put it in [100,200] with the same name.

NET =X10_QED.DEQ[11,337]
 If the user is logged in to [100,200] the effect of this command is identical to the above example.

NET PED_[200,111]A.1,A.2,A.3=X10_[200,665] XX.A,XX.B,XX.C
 get the files XX.A,XX.B, and XX.C from [200,665] at X-10 and put them in [200,111] on this machine under the names A.1, A.2, and A.3.

4.5 Transfers Involving IBM Nodes

NET IBM_[200,200]=ABC.DEF
 send file ABC.DEF on this machine to the IBM computers (360/91 or 360/75).

NET CTC_[200,200]=ABC.D
 send file ABC.DEF on this machine to the IBM computers (360/195 or 370/155).

4.6 Unsupported Options

4.6.1 Third Party Transfers

Third party transfers involve two nodes, neither one of which is the node to which the user is logically connected. One such transfer might be

NET X10_ABC.D[200,177]=RSX_ABCDEF.D.33[200,6]

when the user is logged into the PED DEC-10. These transfers involve difficulties in routing the requests which, while not insuperable, are beyond the scope of this first implementation of the command and the network.

4.6.2 Same Node on Both Sides of the Command

If the node to which the user is logically connected is specified as both source and destination nodes, or as either node with the other unspecified, or if both nodes are omitted, then either by explicit statement or default both nodes will be the node to which the user is logically connected. The request thus becomes a request to move files between two areas on the same machine. PIP or the COPY command can accomplish this more effectively than the NET command.

If the user specifies both nodes as some other node, the request will not be permitted. Since the transmission software requires privileges unavailable to the ordinary user, it is possible to do things not ordinarily permitted to the users. Among those abilities might be to queue work for the batch queue on a remote computer under a PPN not normally available to the user. Accordingly, these capabilities are being denied within the NET command itself by not permitting such requests for file transfer between two areas on a remote computer.

Examples of both unsupported options follow:

The following assume the user is logged into the FED DEC-10.

NET A.B=C.D

Both nodes default to the local machine.

NET FED_ABC=FED_ABC

Both are explicitly the local machine.

NET OPN_APP=ABC

The source node defaults to the same node as the destination.

NET FED_ABCC=ABC

As above.

NET X10_INP:ABC.D[2,5]=X10_NASTY.TRY[200,553]

This user is trying to get some work done for free.

NET X10_LPT:=X10_NIGHT.BE[200,55]

The user is trying to print a file at X-10 without logging in at X-10. The system and operators would be unable to determine to whom to send the output.

4.6.3 Retrieval from Livermore-Network Nodes

There is no capability in the NETOUT program or command string to permit a user logged into one of the USC computers to request the transmission of a file from some other computer. Requests to dc so are intercepted by the NET command processor and denied immediately.

NET ORN_ABC.DEF[3,4]=A7600_NO.NO[3,4]

4.6.4 Wildcard Retrieval Requests

The software that permits the use of wildcard commands is extremely large. If wildcards were to be permitted in retrieval commands, the command would have to be interpreted at the remote computer, so the NET command processor and the system software that permits wildcarding would have to be part of the system program that does file transfers. The addition of so much code to the spoolers is quite unattractive at this time. Such requests are intercepted by the NET command processor and denied.

NET ORN_*.MAC[200,1*4]=X10_*.MAC[200,333]

Requests that all the MAC files in [200,333] be sent to the ORN computer to be placed in [200,1*4]. If the user is logged in at ORN, the request will be denied immediately.

5. CONCLUSION

The power and versatility of the NET command provide the user with an effective and useful means of transferring files between various computers.

APPENDIX A
Net Command Help File

APPENDIX A

Net Command Help File

This information is designed to aid the novice in elementary use of the NET command. The text is available on both machines supporting the NET command and is available to the user by typing "HELP NET".

The general form of the NET command is

NET DESTINATION_filespec=SOURCE_filespec

where DESTINATION and SOURCE are node names supported by the network. The delimiter (underscore or backarrow) is required when the node is specified.

To transfer files from ORN to X-10

NET X-10_filespec=ORN_filespec

To transfer files from X-10 to ORN

NET ORN_filespec=X-10_filespec

To send files to the 11/45 impact printer from the computer to which the user is logically connected

NET RSX_LPT:=filespec

The item "filespec" consists of a device, a file name and extension, and a PPN. They are specified in the usual DEC-10 PIF-style string, i.e.,

DEV:FILE.EXT[P,PPN]

BLANK PAGE

Wildcard specifications are legal in the file, extension, and PPN fields. Examples using wildcards follow:

NODE_A.*=NODE_B.*

yields

NODE_A.A=NODE_B.A

NODE_A.B=NODE_B.B

if files B.A and B.B are the only files with the name B in the user's area.

NODE_A?.B=NODE_B?.1

yields

NODE_A1.B=NODE_B1.1

NODE_A2.B=NODE_B2.1

if files B1.1 and B2.1 are the only files with two-character names, the first of which is B, or with the one-character name B in the user's area.

NOTE that wildcarding on retrieval requests is not supported.

Multiple file specifications in one NPT command are also legal.

NODE_=A,B,C

yields

NODE_A=NODE_A

NODE_B=NODE_B

NODE_C=NODE_C

and

NODE_1,2=NODE_A,B,C

yields

NODE_1=NODE_A

NODE_2=NODE_B

NODE_C=NODE_C

Extra destination filespecs are ignored.

DEFAULTS

The default node is that node to which the user is logically connected. At least one node must be specified, and one node must be the node to which the user is connected.

The default device is DSK:; however, that device is spelled at the relevant node.

The default destination file name is the same as the corresponding source file name. The source file name is required.

The default local node PPN is that of the user.

APPENDIX B

Implementation of the NET Command

APPENDIX B

Implementation of the NET Command

1. The following files must be available for the installation of the NET command:
 - A. NETCON.MAC Source for the NET command scanner/processor.
 - B. SCNMAC.MAC Companion file for the assembly of NETCON.MAC. DEC-supplied.
 - C. SCN7B.RPL Command string processor. DEC-supplied.
 - D. WLD7A.RPL Code to elucidate wildcard requests. DEC-supplied.
 - E. HELPEP.RPL Subroutines for C. and D. DEC-supplied.
 - F. QUEUER.PEL Provides an interface between the user and the DEC queue structure. DEC-supplied.
 - G. WANPIK.REL Creates a unique file name. Supplied in support of the NFE network.

2. The command must be defined in the system file COMCON. (If the command to invoke the NETCON code is not "NET" code in NETCON.MAC must be changed.)

3. If nodes other than those specified herein are to be supported, the following must be done:
 - A. The nodes must be defined in NETCON.MAC;
 - B. One or more spoolers must be provided for servicing those nodes;
 - C. A queue for servicing those spoolers must be defined. Changes to QUEUE.MAC and QMANGR.MAC will be required;

- D. If the command syntax acceptable to those new nodes varies from one of the supported formats, code to support that syntax must be added to NETCOM.MAC; and
 - E. If any additional switches are to be supported, they must be defined in and handled by NETCOM.MAC.
4. The node upon which the command is to be implemented must be identified in NETCOM.MAC. Using TECC,

```
WYYY=$0LT$$
```

and modify as appropriate. All node-specific codes for the ORW and X-10 nodes are controlled by the conditionals at the line found above and those immediately following.

- 5. The file NET.HLP should be created for the user's benefit.
- 6. The changes, if any, to NETCOM.MAC may be tested by using the file NETBAT.CTL. This file contains many NET commands testing various options. It may easily be changed using TECO to test any additions. At PED a few commands are tried in timesharing mode and then the file is submitted to batch for exhaustive testing.
- 7. LOAD and SSAVE NETCOM. Copy the resulting file to SVS:.