

PA-ABQ-602

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***System
Operator's
Manual***

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Section 1: Introduction and purpose

This manual is written for the system operator who wishes or needs to know how the software works in great detail from a technical standpoint, instead of just a user's standpoint.

This is the second manual, and accompanies the *User's Manual*.

It is assumed that the user of the *Sysop's Manual* is already proficient in the concepts and procedures covered in the *User's Manual*. If not, it is recommended that you first read the user manual before proceeding with this one.

In organizing this manual in a logical format, certain critical elements have been buried within noncritical elements. The system operator should be sure to read the following very important sections:

- 4 Elements of the PerManNet Kit software package
- 4.7. Configuration programs and files
- 4.72. LOCATION.EXE and the FDNODE.CTL file
- 4.74. FrontDoor mailer and message editor
- 5. Setting up scheduled events scheduled polling and sending
- 5.1. Routing messages and files using ROUTE.FD
- 5.2. Scheduling events ROUTE.FD file and FDSETUP
- 5.3. Overriding event restrictions

This manual is intended primarily as a reference manual.

The user may, of course, read it in order from start to end. However, the user can usually read a later section without having read earlier sections.

Section 2: Introduction to FidoNet

This software evolved from a cooperative network called FidoNet.

FidoNet was initially created to share messages between different Bulletin Board Systems (BBSes). However, FidoNet expanded to become a general "store & forward" system for exchanging messages between PC's which do not necessarily operate a BBS.

Within FidoNet, a "Fidonet Technical Standards Committee (FTSC)" was formed to agree upon and establish standards so that software authors could write software modules which would work with other software modules written by different authors. This includes such things as the handshake between mailers, the data packet, and the names of compressed data files.

Other networks completely independent of FidoNet have adopted the "FidoNet technology" standard. It is important to distinguish between "FidoNet" and "FidoNet technology."

Many networks pattern their administration after FidoNet. The nodelist itself has provisions for certain FidoNet administrative positions, including hubs, network coordinators, and other positions.

Each local net usually has the following administrative positions:

- A. One or more hubs for routing netmail and conference mail
- B. A Net Coordinator (NC), an elected administrator for a net who is given a node address of zero, e.g., 2:283/0, and is responsible for allocating new node numbers and all other administrative matters.

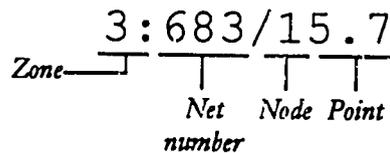
Additional administrative positions exist for large nets.

2.1 Addressing

As explained in the user's manual, each PC has an e-mail address, and each address is represented by one PC. There can be either one or multiple users at a particular address using one PC.

An address in netmail is similar to a zip code. Each number in a zip code tells the post office where in the country, state, county and city your letter should go. If you address you letter in-correctly, then it will not go to the right address. It is the same in netmail.

An Address commonly looks like the following, and has 4 parts:



The four parts of the address are called:

1. Zone (3): The zone number is the first number in every address followed by a ':'. There are 6 zones in the FIDONET addressing system which correspond with 6 parts of the world. They are as follows:

- Zone 1: North America
- Zone 2: Europe and the CIS
- Zone 3: Australia and New Zealand
- Zone 4: Latin America
- Zone 5: Africa
- Zone 6: Asia

2. Net 683/ The number following the zone number is the Net number which indicates a local calling area.

3. Node 15 A PC with a system operator, who as a general rule operates 24 hours a day.

4. Point .79, which is a PC with a system operator which is not in the nodelist, and uses a node as relay. (In this example, node 15.)

Nodes are listed in a nodelist, which is a sort of "international phone book" that contains the following information:

- A. Name of the primary system operator of every node,
- B. Location,
- C. Phone number, and

D. Modem speed.

On a mailer network, each Personal Computer (PC) has an electronic mail address, and each address is represented by one PC. There can be one or multiple users at a particular address using one PC. For example, the Country Director can be a user, as well as the drought coordinator. However, if they are using the same machine, and 1 phone line, they will have only one address for that site. The addressing is one for every distinct site, not per user per site.

The nodelist is circulated to every node in the network, as are weekly updates. The nodelist is automatically used by the mailer for sending mail and files, and used by the message editor to look up the address of a user when you know their name but not their address (or vice versa).

Points are not listed in the nodelist. All mail addressed to a point is normally routed to the point's "bossnode" which is listed, who in turn relays the mail to the point.

Other, non-FidoNet networks may use different zones to designate different continents and/or regions.

2.2 The mail transferring structure of FidoNet

Within FidoNet, nets are divided into regions whereby one Regional Coordinator is responsible for administering the different Net Coordinators. In turn, the top administrative position for a zone is the Zone Coordinator, who oversees the Regional Coordinators. There is only one Zone Coordinator for each zone.

Different continents administer their message traffic in different ways, depending upon the volume and local situations. For example, in the U.S. there are 19 regions. Conference mail to/from the different hubs is routed to its regional relay, and from there it is relayed again to the "echomail zonegate" for relaying overseas to other echomail zonegates before trickling back down to the nodes in that zone. Netmail can be routed in much the same way, but it can also be sent directly to the Zonegate. Conference mail may not be routed to any system except its designated hub, but one-to-one netmail can be routed whichever way one wishes, including private routing.

While there are certain default routing methods used in FidoNet, one may route one's netmail any way one chooses, by making sure to NOT send anything to the FidoNet "Zonegate", and by creating an

appropriate routing file (\FD\ROUTE.FD), as discussed later in this manual.

Often, mail is not sent directly from node to node. Most networks have a hub system whereby nodes in a local calling area engage in a cost sharing operation for long distance mail. A connection between two mailers using a high speed modem can often send 50 to 100 or more messages per minute, so that it is more economical to relay many peoples' mail together thru a network's various administrative layers.

2.3 More information on FidoNet

The official document that outlines the structure of FidoNet is called POLICY4.TXT and should be requestable from any FidoNet Coordinator, major FidoNet hub, or SDS (Software Distribution System) site.

The FidoNet specifications are also available from many SDS sites and nodes operated by sysops who are participating in the development of FidoNet technology. (The filenames generally start with the characters FTSC, FTS, and FSC, so that requesting FTSC*.* , FTS*.* and FSC*.* should retrieve those documents, though there is usually one file which has them all. You should see the node's FILES catalog.)

Section 3: Elements of FidoNet technology

Within FidoNet, a "Fidonet Technical Standards Committee (FTSC)" was formed to establish standards, protocols, for software development. This allows software authors to write software modules which are compatible with other software modules written by different authors. These standards have been adopted by countless other networks which are completely independent of FidoNet but use FidoNet technology.

These standards include the following:

- A. Addressing (zone:net/node.point)
- B. Nodelist format, and format of "nodediff" update files
- C. Mailer handshaking via modem
- D. Data packet format and filename extension
- E. Compressed file filename extension

For example, there are many different mailers which handshake with each other via modem, including:

FrontDoor (DOS)
InterMail (DOS)
BinkleyTerm (with DOS and OS/2 versions)
D'Bridge (DOS)
SEADog (DOS)
Dutchie (DOS)
Formula 1 (Macintosh)
MacWoof (Macintosh)
Tabby (MacIntosh)
Copernicus (MacIntosh)
RFMail (Unix)

Xenolink (Amiga)
This package uses FrontDoor.

3.1 How the pieces work together

- A. First, the modems go through handshaking, in order to agree upon a speed and modem protocol.
- B. Then data is exchange in the form of "packet" files, which have an extension of PKT and are formatted according to FidoNet technology specifications. Sometimes, the packets will come in an uncompressed file with the PKT extension, and sometimes the PKT files will reside within a compressed file with a day of week extension, e.g., SU0, SU1, etc., for Sunday, MO* for Monday, TU* for Tuesday, WE* for Wednesday, TH* for Thursday, FR* for Friday, and SA* for Saturday.
- C. The software recognizes from the filename that the file is a compressed file, and proceeds to extract its packets, process those packets, and then delete the compressed file.

3.2 Basic elements in a node set-up

There are certain software elements that are common to all nodes' setup:

Mailer — deals with the modem, handshakes, transfers data. A sample of available mailers are listed above.

Mail processor -also called a "tosses/scanner" — processes conference mail and any kind of compressed mail. The following are a few of hundreds of competing packages:

GEcho
TosScan
Squish
IMail
FreeMail

This package runs the GEcho mail processor. All mail processors rely on third party compression/decompression programs, as discussed a few paragraphs above, and also in the next section.

3.3 Compression/decompression programs, primarily:

PKARC and PKXARC (Phil Katz) to decompress all ARC files received by all systems (incl. SEADog), and to send to any non-SEADog systems.

PKPAK and PKUNPAK (Phil Katz' post-lawsuit package), which does the exact same thing as PKARC and PKXARC but under a different name.

ARCA and ARCE to handle SEA ARC files (Systems Enhancement Associates, the makers of SEADog), and needed for sending compressed files to a SEADog system.

PAK (NoGate Consulting version)

PKZIP and PKUNZIP to handle ZIP files

LHA to handle LZH files

ARJ to handle ARJ files

Most people need only PKPAK/PKUNPAK and PKZIP/PKUNZIP, since those two are by far the most commonly used. PKZIP creates files that are about 20% smaller than those of PKPAK.

3.4. Message reader/editor

This software package uses the FrontDoor message editor, which is packaged with the FrontDoor mailer.

A message editor may store messages in any format it wishes, proprietary or nonproprietary. This software package uses the "*.MSG" format (one file per message) for netmail, and the "Hudson Messagebase (HMB)" format for conference mail. The HMB format is better equipped to handle large message volumes. The FrontDoor mailer extracts the netmail messages from uncompressed, incoming packets and converts them into the *.MSG netmail format.

A popular alternative message reader/editor which provides better support for non-English languages is GoldEd. It can also handle both *.MSG and HMB formats.

Before considering any other message editor, one should make sure it supports both *.MSG and HMB formats

3.5. Nodelist processors

There are three general utilities used to handle nodelists:

3.51. NODEDIFF processor.

Nodelists grow as more nodes join a network. FidoNet and many other networks do not circulate a new nodelist, as their nodelists are quite large and that would cause many users' phone bills to become expensive. Instead FidoNet, and many other networks circulate a "nodediff" file. The nodediff file is coded file which gives additions, deletions, and changes in the nodelist. This file must be processed by a nodediff processing program to create a new nodelist.

The FrontDoor package does not include such a program. The most commonly used program is a public domain program called EDITNL by Baker & Associates, which is included in your software package. You can invoke this program from the "Nodelist update" section, under the "Periodic maintenance" sub-menu of the PerManNet Kit's main menu.

The NODEDIFF files are given an extension that reveals the day of the year in the last two digits. For example, October 9, 1992 was the 283rd day of the year, and the FidoNet NODEDIFF for that week was NODEDIFF.a83, meaning that the nodediff was stored in ARC format. The "2" in "283" is redundant, since FidoNet nodediffs are circulated on the Friday of each week of the year, and there are no two Fridays in a given year which have the same last two digits.

3.52. Nodelist editor

Make changes to the nodelist by editing the raw nodelist file after examining it for its format. An FTSC document exists with guidance on editing the nodelist.

The FrontDoor 2.10 commercial package comes with a "nodelist editor." However, that program does not actually edit the nodelist file. Instead, it creates its own specially coded, proprietary file which overrides any entries in the nodelist or adds to those entries on your system.

The only way to truly edit a nodelist is to edit the raw nodelist file using a text editor.

3.53. Nodelist "compiler" — index files

Nodelist index files are used to speed up the process of finding a node

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in the nodelist. For example, when the FrontDoor mailer needs to find the phone number of a node, or the message editor needs to find the address of a user when given the user's name, FrontDoor must find that information in the nodelist quickly. In order to speed up the process, FrontDoor maintains its own index files.

These index files are proprietary. They also must exist when FrontDoor is run, or else FrontDoor will abort itself. The index files are created by running the program FDNC, which is included in the FrontDoor package. This program is run automatically during installation of the software, and again after any nodediff processing.

Section 4: Elements of the PerManNet Kit software package

The PerManNet Quick Startup Kit is a user-friendly interface for a node. It will install a functioning, customized node setup, and provide an easy to use, organized menu system.

This section explains how the PerManNet Kit works behind the scenes.

4.1. The installation program

The PerManNet Kit can be installed by copying all of the files from the distribution floppy drives to any directory on the hard disk and running the INSTALL.EXE program. For example:

```
C:  
CD\  
MD\INSTALL  
CD\INSTALL  
COPY A:*.*
```

[repeat the COPY A:*. * for each diskette]

```
INSTALL
```

From that point, you just answer the questions.

The installation program will create all the directories it needs, move

the files to those directories, and configure the software to your custom needs according to how you answer the questions presented to you during installation. At the end, the \INSTALL directory software will be empty except for the INSTALL.EXE program. You may remove it and the \INSTALL directory thereafter.

4.2. START.BAT, the FOSSIL driver, and the main menu

To run the PerManNet Kit, you execute the command START, which consists of the following batch file. The reference to C: is only for example. If you installed the kit to your D: drive, then it would say D:

```
C:
cd \fd
set FD=C:\FD
set GECHO=C:\FD
bnu
ansi
startbat.exe
```

STARTBAT.EXE is the main menu program for the PerManNet Kit, and was named that way to remind users to run the main menu by START.BAT instead of by the EXE, so that the FOSSIL driver, BNU.COM in this case, would be loaded. The BNU will self-detect and not load itself on top of itself if attempts are made to load it more than once.

What is a fossil driver?

FOSSIL is an acronym for Fido-Opus-SEADog Standard Interface Layer. It was created in order to allow many different communications programs to work together, such as a mailer, a BBS, and on-line BBS utilities. It also facilitates operation in a multitasking environment such as Desqview.

BNU.COM is a FOSSIL driver. The FrontDoor mailer software communicates to BNU.COM, and BNU.COM communicates with the serial port. Documentation for BNU exists in the directory \FD\DOCUMENT\BNU.

The main menu looks like this:

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```
***** Main Menu *****
Frequent off-line actions:
  B Message reader/editor
  B Bundle/unbundle conference mail
  F File management programs

Automated on-line actions:
  M Network mode - dial and answer

Occasional off-line actions:
  C Configuration
  P Periodic maintenance
  L Logs and statistics
  H Help
  Q Quit

Explanation of item hi-lighted by cursor bar:
Read only mode messages (Can also attach files/graphics to messages.)
*****
PerManNet Startup Kit, Version 3.01
*****
```

You choose a selection by either typing the letter beside the selection or moving the cursor down to that selection and hitting Enter.

****Note:** More information on the highlighted is given at the bottom of the screen.

Each selection on the menu does one of three things:
Goes to a submenu
Calls a batch file in the \FD directory
Calls an executable program in the \FD directory

The remaining subsections below tell you what each function does and how it works.

4.3. The FrontDoor message editor

Choosing the message editor simply runs the batch file MAILEDIT.BAT, which runs this batch file:

```
@echo off
cls
```

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```
echo                               Alt M for Menu
echo                               or
echo                               Alt H for Help
fm.e <e
```

4.4 Bundling conference mail

Choosing this selection runs the batch file MAILSCAN.BAT, which is:

```
@echo off
cls
rem This batch file checks for outbound conference mail.
rem If found, GEcho bundles it into an outbound packet,
rem compresses the packet, and creates the file attach
message.
cd\fd
gecho scan
```

4.5. The Front Door network mailer

This selection runs NETWORK.BAT, which is:

```
STARTUP
rem First, you must run a "fossil driver". It manages
your modem hardware.
echo Running FOSSIL driver. (May be recundant.)
BNU
rem Second, you set your "environment variable(s)".
(May be redundant)
SET FD=\FD
SET GECHO=\FD
rem Make sure you have an ANSI driver loaded for
nicer screen handling.
ANSI
```

```

:FD-RERUN

rem This is the main part -- FD.EXE runs the network
mailer program.

echo off

CD\FD

FD

rem FrontDoor exits with errorlevels depending upon
how you set it up in

rem FDSETUP. For example, when you run FDSETUP you
will find:

rem

rem 1. Processing of received mail/files in FDSETUP
-> Mailer -> Errorlevels

rem 2. Scheduled events in ..... FDSETUP
-> Manager -> Events

rem 3. (optional) BBS call handling in .... FDSETUP
-> Mailer -> Errorlevels

rem The format below is "IF ERRORLEVEL x GOTO y"
rem where "x" is a number between 33 and 255 and set
up in FDSETUP, and
rem where "y" is a subroutine in Part 3, which would
start with ":y"

rem _____
rem ___ FrontDoor exits at errorlevel 99 for com-
pressed mail received

rem _____
IF ERRORLEVEL 99 GOTO TOSS

rem _____
rem _____ Errorlevels 1-9 report errors detected by
FrontDoor

rem _____
IF ERRORLEVEL 10 GOTO USERBREAK
IF ERRORLEVEL 7 GOTO FOSSIL

```

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```
IF ERRORLEVEL 5 GOTO MODEM_BOOT
IF ERRORLEVEL 3 GOTO DISKLOW
IF ERRORLEVEL 2 GOTO FILEOPEN
GOTO FD-RERUN

:TOSS
  rem This part of the batch file processes inbound
  conference mail.

  rem Technically, what it does is search the mailer's
  inbound directory

  rem for mail packets and/or compressed mail bundles,
  decompresses any

  rem compressed mail bundles into packets, and then
  imports the

  rem messages inside each packet to the proper confer-
  ences.

  cd\fd

  rem First, GEcho re-indexes its own files to assure
  integrity.

  gsetup index

  rem Secondly, it processes the inbound mail.

  gecho toss

  rem Third, it links reply chains.

  mbutil link -clean -force

  rem The next module keeps statistics on the flow of
  conference mail.

  rem It runs only if you have obtained this optional
  upgrade module.

  if exist gms.exe goto stats

  goto fd-rerun

:stats
  call gms-all
  goto fd-rerun

:USERBREAK
  Errorlevel 10
  ECHO OFF
```

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```
' :LS
      ECHO User has hit the key to Quit, Alt Q so FrontDoor
      is down as requested.
      pause
      goto END
:FOSSIL
      rem Errorlevel 7
      echo Fossil driver not detected.
      pause
      goto end
:MODEM_BOOT
      rem Errorlevel 5
      echo Modem initialization error. Make sure you have
      the right COM port set.
      pause
      goto end
:DISKLOW
      rem Errorlevel 3
      echo Disk space is low. Please clear off some space
      and then re-start.
      pause
      goto end
:FILEOPEN
      rem Errorlevel 2
      echo File reading error. Try rebooting and
      re-starting.
      pause
      goto end
:END
```

A more elaborate batch file, CM.BAT, is included in the Kit, and is intended for sophisticated systems which may be unattended for weeks at a time or for mailers which are run with an underlying BBS.

In the above example, and in some following examples, reference is

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made to something called an "Errorlevel". This is NOT a report of an error. Errorlevels are a means whereby two different programs can communicate a piece of information to each other when running in a batch file.

For example, in FrontDoor's configuration program, you can specify that FrontDoor should exit with an errorlevel of 99 if conference mail is received. Then you could run FrontDoor from a batch file, as in the above example, and have the batch file check the errorlevel and run the mail processor if the errorlevel is 99.

Analogous things can be done if you create an event which has FrontDoor exit at an errorlevel at a particular time of the day, e.g., to process the nodelist.

It is important to know that DOS will act upon an "IF ERRORLEVEL" statement if the errorlevel is found to be GREATER THAN OR EQUAL TO the number specified. For example, if FrontDoor exits with an errorlevel of 130 and your batch file says

```
IF ERRORLEVEL 145 GOTO MAILTOSS
IF ERRORLEVEL 135 GOTO MAILSCAN
IF ERRORLEVEL 125 GOTO NODEDIFF
IF ERRORLEVEL 115 GOTO MAINTAIN
```

then the batch file will go to the NODEDIFF segment.

4.6. Configuration programs and files

Choosing the Configuration selection from the main menu gives you a submenu, which guides you to configuring the different programs included in the kit.

4.6.1. Conference Manager

This runs CONFMGR.EXE, which is explained in the User's Manual. ConfMgr modifies a file called AREAS.BBS, which is a generic file used and understood by FidoNet sysops. The information in the AREAS.BBS file is subsequently translated to the FrontDoor folder configuration file and the GEcho mail processor configuration file.

This selection runs the batch file CFG-CONF.BAT, which performs the following:

```
@echo off
cls
cd\fd

rem ConfMgr is the program that lets you easily scroll
  up and down your
rem list of conferences and easily tag/untag them, and
  creates the cryptic
rem robot to robot messages for you.
rem ConfMgr edits a file called AREAS.BBS plus puts a
  robot message into
rem netmail addressed to your uplink.
confmgr.exe
pause

rem Hereafter, we convert AREAS.BBS to both GEcho and
  FrontDoor Message
rem Editor formats.
@echo off
rem First, to FrontDoor message editor format
AREAS2FD
rem Second, to GEcho format
DEL AREAFILE.GE
GCONVERT 1
cls
echo Special thanks to Hans Siemons, 2:285/214
echo .
pause
```

4.62. LOCATION.EXE and the FDNODE.CTL file

This program is a menu-driven way to edit the \FD\NODELIST\FDNODE.CTL file, which is a critical file. The technically inclined may prefer to edit the file directly, instead of using LOCATION.EXE. Notably, LOCATION.EXE is not a full featured program but deals with only certain basic dialing considerations.

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The FDNODE.CTL file is where you specify such things as long distance access codes, which systems in the ::odelist are local and which are long distance, and any additional nodelists or pointlists you wish to use.

FDNODE.CTL is discussed at great length in chapter 5 of the FrontDoor 2.10 commercial Administrator Guide.

After editing FDNODE.CTL, the user must run FDNC, the FrontDoor nodelist compiler. This is done automatically after choosing the LOCATION.EXE program from the main menu, but must be done manually if you edit FDNODE.CTL manually. No other nodelist compiling programs need to be run besides FrontDoor's.

Choosing the Location selection from the Configuration submenu runs the batch file CFG-LOCL.BAT, which does the following:

```
@echo off
cls
rem This utility changes your area code dialing parameters.
LOCATION.EXE
@echo off
echo If you did not make any changes, then press Ctrl C
now and answer Yes.
pause
fdnc/f
@echo off
echo Press a key to run the File Manager's nodelist
indexer.
pause
fnode
```

4.63. GEcho mail processor (tosses/scanner)

This selection runs GSETUP.EXE

You should generally not need to run this selection unless you are adding an AKA or wish to automatically delete messages that are older than a certain age threshold, or messages in excess of a certain number threshold.

****NOTE:** Hit Alt H anywhere within the GEcho setup program will give context-sensitive help.

4.64. FrontDoor mailer and message editor

This selection runs the program FDSETUP.EXE, which configures the FrontDoor mailer and the FrontDoor message editor.

It is VERY IMPORTANT that the reader become familiar with many of the functions of the FrontDoor program, by reviewing Chapter 2 in the FrontDoor 2.10 commercial Administrator's Guide while browsing within FDSETUP.EXE.

4.65. Requestable files

This selection instructs the user on how to quickly make a file requestable, how to add it to its list of requestable files, and where to go for additional information. It does not execute any programs.

4.7. Periodic Maintenance

Two things need to be done periodically:

1. shrinking the messagebase
2. updating the nodelist when you receive a nodediff.

How often you shrink your messagebase depends upon how much volume of conference mail you receive. Some people need to shrink their messagebase once every 3 months, and some need to do so daily.

The reason why you need to pack your messagebase was discussed in the User's Manual.

4.71. Pack messagebase, shrinking the files.

This runs the batch file WEEK-VOL.BAT, which performs the following functions:

gsetup index
mbutil purge pack link

Purge will delete any old or excessive messages if you have specified any thresholds in GEcho configuration (GSETUP.EXE). Pack is what shrinks your messagebase. Link connects message reply chains on the same topic.

4.72. Do you need to shrink your messagebase?

This selection runs WEEKHELP.BAT, which explains to the user that they need to make sure their messagebase doesn't exceed a certain size, and shows you how close you are to the maximum limit in messagebase size.

4.73. Current volume of messages in each conference.

This selection runs WEEK-VOL.BAT which shows how many messages reside in each conference. The contents of WEEK-VOL.BAT:

```
@echo off
cls
mbutil report -traffic
browse traffic.rpt
```

4.74. Nodelist update

This selection processes inbound NODEDIFF files, using the public domain EDITNL.EXE program within the batch file WEEKNODE.BAT:

```
echo off
cls
echo Updating the nodelist
if not exist \fd\inbound\nodediff.* goto notfound
COPY \FD\INBOUND\NODEDIFF.* \FD\NODELIST
CD\FD\NODELIST
\FD\EDITNL /X=PKXARC /CLEAN
IF ERRORLEVEL 2 GOTO FATAL
IF ERRORLEVEL 1 GOTO CRCERROR
IF ERRORLEVEL 0 GOTO SUCCESSFUL
:FATAL
echo Fatal error attempting to update nodelist.
goto end
:CRCERROR
echo Error in nodelist update file. Please call your
source.
goto end
```

```

:SUCCESSFUL
cd\fd
fdnc /f
goto filemgr
:NOTFOUND
echo No update file found in your inbound directory.
  Aborting.
goto end
:filemgr
fnode
goto end
:END
cd\fd
pause

```

4.8. Logs and statistics

4.81. FrontDoor — browse the raw log file

This selection calls LOG-FD.BAT which browses the raw log file. It also lets you start with a fresh new log file and append the old one to the end of a history file, as detailed in LOG-FD.BAT

4.82. Current volume of messages in each conference

This runs WEEK-VOL.BAT

C. GEcho - view the raw log file

This selection calls LOG-GE.BAT, which browses the raw GEcho mail processor file.

4.83. "To you" messages in conferences

This selection calls MAILMINE.BAT, which searches your messagebase for all messages addressed to the first username in the FrontDoor setup.

4.84. RAM stats - DOS memory available (DOS 4.0+)

This selection calls LOG-MEM.BAT

4.9. Directories and files

The following subdirectories exist within the FrontDoor directory:

\FD\BADECHO	Where "bad" conference mail messages are put, due to their belonging to an undefined folder, or due to security violations, or due to being corrupted
\FD\ECHOMAIL	Where your conference mail messagebase files are stored
\FD\NETMAIL	Where your *.MSG netmail message files are stored
\FD\INBOUND	Where inbound files are put by the FrontDoor mailer
\FD\LIBRARY.M	Where you can put files for others to request from you
\FD\LIBRARY	A directory used by the FileMgr program
\FD\NODELIST	Where your nodelist files reside, including FDNODE.CTL
\FD\OUTBOUND	Where GEcho and FileMgr place outbound compressed files
\FD\OUTPKTS	A temporary scratch directory for GEcho
\FD\PACKETS	Where the FrontDoor mailer stores temporary packets
\FD\DOCUMENT	Where documentation files reside for the different software modules, as specified below:
\FD\DOCUMENT\ARC	For PKARC and PKXARC compression/decompression
\FD\DOCUMENT\ARJ	For the ARJ compression/decompression program
\FD\DOCUMENT\BNU	For the BNU FOSSIL driver
\FD\DOCUMENT\CONFEREN	For the conference lists used by ConfMgr

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\FD\DOCUMENT\FD	FrontDoor 2.02 (noncommercial) documentation
\FD\DOCUMENT\GECHO	GEcho mail processor
\FD\DOCUMENT\LZH	For LHA/LZH compression/decompression
\FD\DOCUMENT\MISC	Miscellaneous documentation
\FD\DOCUMENT\PAK	For PKPAK/PKUNPAK compression/decompression
\FD\DOCUMENT\ZIP	For PKZIP/PKUNZIP compression/decompression

Within the \FD directory, the files serve the following purposes:

STARTBAT EX	The main menu program for the PerManNet Kit
START BAT	The batch file that should be used to start the main menu
HELP BAT	A batch file identical to START.BAT in case a user forgets.
MENU BAT	A batch file identical to START.BAT in case a user forgets.
POINT BAT	A batch file identical to START.BAT in case a user forgets.
NODE BAT	A batch file identical to START.BAT in case a user forgets.
GO BAT	A batch file identical to START.BAT in case a user forgets.
RUN BAT	A batch file identical to START.BAT in case a user forgets.
STARTKIT BAT	A batch file identical to START.BAT in case a user forgets.
PERMANET BAT	A batch file identical to START.BAT in case a user forgets.
STARTUP BAT	A batch file identical to START.BAT in case a user forgets.

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STARTER BAT	A batch file identical to START.BAT in case a user forgets.
ANSICOM	Called from START.BAT et al. (optional - can be removed)
BNU COM FOSSIL	driver called in START.BAT, NETWORK.BAT, and CM.BAT
CFG-CONF BAT	These batch files are called from the START main menu,
CFG-ECHO BAT	and are all discussed above.
CFG-IOCL BAT	
CFG-MORE BAT	
CFG-NET BAT	
MALEDIT BAT	
MAILSCAN BAT	
MAILTOSS BAT	
SYNERGY BAT	
LOG-FDLA BAT	
LOG-MEM BAT	
WEEKHELP BAT	
WEEKNODE BAT	
WEEKMAIL BAT	
LOG-FD BAT	
LOG-GE BAT	
LOG-GMS BAT	
WEEK-VOL BAT	
FILE-REQ BAT	
NETWORK BAT	
MAILMINE BAT	
MAILMINE TXT	Temporary file for MAILMINE.BAT
UPGRADE BAT	These batch files are called from the

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F-FUSL BAT	START main menu, but were not discussed above as they all relate to
F-FEBBS BAT	optional add-on modules. Each explains the add-on
F-ALLFIX BAT	module if it does not find the executable program in
LISTSERV BAT	the \FD directory.
UUCODING BAT	
CM BAT	Optional batch file to run FrontDoor with a BBS. This batch file is heavily commented and can be educational.
BROWSE COM	A file browsing utility called from many batch files.
FIND-COM BAT	This optional batch file finds which serial port your modem is attached to and modifies SETUP.FD, and is most useful during installation if you don't know which COM port your modem is hooked up to.
FDSCEXE	Utility called by both INSTALL.EXE and FIND-COM.BAT
FD EXE	FrontDoor mailer program
FD OVR	
FM EXE	FrontDoor message editor program
FM OVR	
FDSETUP EXE	FrontDoor setup program
FDNCEXE	FrontDoor nodelist "editor" and compiler program
FDNCOVR	
ROUTE FD	ASCII file that you edit for routing and events
SETUP FD	Coded FrontDoor file with your general setup, except:

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EVENT FD	Coded FrontDoor file with your events configuration
FOLDER FD	Coded FrontDoor file with your folders configuration
PASSWORD FD	Coded FrontDoor file with node password configuration
FD LOG	ASCII file FrontDoor appends log items to
LASTCALL FD	Coded FrontDoor housekeeping file on your last connects
OUTBOUND HIS	Coded FrontDoor mailer file on outbound history
INBOUND HIS	Coded FrontDoor mailer file on inbound history
FMRESCAN NOW	FrontDoor housekeeping semaphore file
FDRESCAN NOW	FrontDoor housekeeping semaphore file
FD SYS	Copy of SETUP.FD for older utilities to use
FOLDER SYS	Copy of FOLDER.FD for older utilities to use
GECHO EXE	The GEcho mail processing program (tosses/scanner)
MBUTL EXE	The GEcho messagebase utility
GSETUP EXE	The GEcho setup program and index generator
SETUP GE	The GEcho coded general configuration file
AREAFILE GE	GEcho coded file on conferences configuration
AREAFILE GEX	GEcho index file on conferences configuration
NODEFILE GE	GEcho coded file on uplinks
NODEFILE GEX	GEcho index file on uplinks

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GECHO DOC	GEcho documentation, must be in \FD for Alt H help
GE_DOC GEX	GEcho documentation hypertext index file pointer
FTSCPROD GE	A file that GEcho references, can be updated
GCONVERT EXE	Converts AREAS.BBS to GEcho AREAFILE.GEX (CFG-CONF.BAT)
ECHODUPE GE	GEcho housekeeping file for trapping duplicate messages
GECHO LOG	Log file for GEcho
MBUTIL LOG	Log file for MBUTIL
CONFMGR EXE	Conference Manager program (see CFG-CONF.BAT)
CONFMGR CFG	Conference Manager coded configuration file
AREAS BBS	Conference configuration and uplink file for ConfMgr
CONFMGR HLP	Displayed if the user asks for help within ConfMgr
AREAS2FD EXE	Utility used to convert between AREAS.BBS and FOLDER.FD
AREAS2FD DOC	Original author's documentation for the above
EDITNL EXE	Utility used to process nodediffs (nodelist updates)
LOCATION EXE	Menu-driven utility for novices -- edits FDNODE.CTL
LOCATION MSG	Must be in the same directory as LOCATION.EXE
FILEMGR EXE	File Manager program
FILEMGR CTL	File Manager configuration file

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FNODE EXE	File Manager nodelist compiler (index file generator)
QSORT EXE	A sorting utility used by FNODE.EXE and optional FDLA.EXE
PKZIP EXE	Compression/decompression programs
PKUNZIP EXE	
PKPAK EXE	
PKUNPAK EXE	
PKARC COM	
PKXARC COM	
ARJ EXE	
LHAEXE	
INSTALL TXT	Left-over files from installation
FDSCTXT	
Y-N COM	A vital utility called by various batch files
NEWSCAN EXE	Program called from MAIL MINE.BAT
GMS CFG	Configuration file for optional GMS add-on module

Section 5. Routing and scheduled events — sending, polling, and answering

5.1. Routing messages and files

It is often more economical or more feasible to route messages to many different nodes through one particular node, using that node as a relay.

A few applications:

In a less developed country in Africa there is limited phone service. It is difficult or extremely expensive to direct dial other countries in Africa. Therefore you route all messages and file attach messages via a hub in Washington, D.C. All messages and files are sent to the Washington, D.C., system in one connection. The Washington system in turn automatically sends them to their final destinations via multiple calls. The one connection with Washington could be initiated either by your system or by the Washington, D.C., system calling you to pick up the messages.

2. The intended recipient of a message runs a node which does not normally answer the phone and which does not run a consistent schedule. You can route the messages thru another system which the recipient often connects to, for the recipient to pick up the next time they connect with that system.

3. You have a nearby associate who regularly connects with a system on a different continent. You have messages that you need to send to that continent. You can route those messages via your nearby associate's node, assuming your associate is cooperative and has set up his routing file to allow you to relay messages and possibly files through their node.

Routing is determined by a file called ROUTE.FD in your \FD directory. A sample ROUTE.FD file is provided with the PerManNet Kit, and is heavily commented in order to assist users in customizing it. You should also consult the FrontDoor 2.10 commercial Administrator Guide, pages 5-16 thru 5-46.

5.2. Scheduled events — the ROUTE.FD file and FDSETUP

You can set up FrontDoor:

- To execute certain operations or behave differently at different times of the day, and/or on different days of the week.
- To send mail during the day but not answer the phone, to answer only during certain hours of the night.
- To poll certain nodes in one time slot, while holding mail to other nodes.
- To poll a system at a certain time, even if there is no mail to send.
- To exit with a certain errorlevel at a certain time or on a certain day in order to execute a particular program (e.g., a different communications program).

To set up a scheduled event, one must do two things:

1. Run the FrontDoor configuration program (either FDSETUP.EXE or Configuration.FrontDoor from the main menu).
2. Then select Manager column.
3. Then select Events selection within the Manager column.
4. Edit the "Schedule" section of the ROUTE.FD file.

The user should consult the FrontDoor 2.10 commercial Administrator's Guide for assistance on these two items, specifically pages 2-32 thru 2-38 for help with the Event Manager section, and pages 5-16 thru 5-46 for help with the ROUTE.FD file.

The ROUTE.FD file that comes with the PerManNet Kit is both functional and heavily commented in order to give the user a quick start. A sample polling event is included in that setup, in both the Event Manager and the ROUTE.FD.

5.3. Overriding event restrictions

Be aware that when you create a message, certain message attributes will override event restrictions, particularly the Imm (immediate) and Crash status flags. Messages marked Immediate will be sent even if the intended recipient is marked as non-CM in the nodelist (i.e., not available continuously for mail transfer).

You can also manually override routing and whether to send or hold a message from the FrontDoor mailer screen by the Alt B pop-up queue management screen. Note that you can change the destination by hitting F6 from within the Alt B screen. This is a way to quickly change the routing of a message without making permanent changes to the ROUTE.FD file.

Section 6: Modem installation and troubleshooting

6.1 Connecting the Modem Hardware

A device called a "modem" is needed to interface between the computer and the telephone system. If you don't have one, then you will need to purchase one.

There are two kinds of modems -- internal and external. Internal modems are located inside your PC (in an expansion slot), and external modems are located outside of your PC and are connected to the PC via a cable.

External modems have 3 cables which must all be connected properly:
power (connected to a wall power outlet)
data (connected to the PC)
telephone (connected to a wall telephone jack)

Internal modems have 1 cable:
telephone (connected to a wall telephone jack)

Sometimes, a modem will have two telephone cords instead of one (adding another cable). The first cord goes from the modem to the wall jack, as described above. The second telephone cord goes from the modem to a regular telephone voice handset. This allows you to use only one wall jack for both your voice and datalines. Also, in this manner, the handset can also be used to verify that the phone line is "live" -- that you do indeed get a dial tone

6.11. If You Don't Yet Have a Modem

If you don't yet have a modem, then you will need to obtain one. The question then becomes whether to buy an external or an internal modem. The advantages of an EXTERNAL modem: easier to connect, assuming you have a free serial port (see the next section) -- no need to open the PC you can feasibly use an external modem for multiple PC's, by unplugging it from one and plugging it into another you can see the activity lights on an external modem (which have little use, unless you are troubleshooting).

The advantages of an INTERNAL modem: less expensive, by \$20 to \$40 for a given model. As of June, 1992, the cheapest 2400 baud internal modems were about \$50, and the cheapest 14400 baud internal modems were about \$300, with prices falling slightly less clutter -- no desk-space needed for an internal modem, no power cord needed, no data cable needed. You may notice that the great majority of this help file is for people who are trying to install an internal modem. You would correctly conclude that using an external modem is much simpler. Some people say: "If you haven't yet purchased a modem, then get an external one." This is solely because it is much easier for a novice to install an external modem than an internal one. I should warn users that not all modems are alike. You generally get what you pay for. You should certainly get a modem that has "non-volatile RAM" for saving a set of default modem settings. There are other factors as well. You may want to seek a competent, unbiased professional to advise you.

6.12. If You Have an External Modem

External modems must be turned on. When you turn the modem on, you will see one or more lights come on. (Internal modems turn on automatically when you turn on the PC.) As listed above, an EXTERNAL modem must have a data cable connecting it to the PC. The modem connects to a "serial" or "COM" port, usually located on the back of the PC. The COM port on the back of the PC consists of pins -- it is a "male" port. (Printer ports are different, and consist of 25 pinHOLES on a port, usually made of black plastic. You canNOT hook your modem to one of these printer ports.) There are two varieties of COM ports -- some COM ports have 9 pins, and some have 25 pins. They are both fine. (On the 25-pin port, only 9 pins are active.) However, you need a cable that is either 9 pin or 25 pin, depending upon which kind of port you have available. If you have no male ports, or if they are all occupied by other devices (e.g., printer, mouse), then you will need to go buy a serial port board, or "card", in

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order to connect an external modem. This serial port board is installed into an expansion slot inside your PC. A serial port board usually costs between \$15 and \$30. You can install it into your PC yourself, or you can pay additional to have a technician install it. Notably, I would recommend that you get a board that uses one of the following brands of chip: NS (for National Semiconductor),

UMC,
SiS, or
STB.

I would recommend that you NOT get a board that uses Winbond, WD (for Western Digital), HM, or no-name chips. Marginal chips are Goldstar and Twinhead. If you have or plan to buy a 9600 baud modem or faster, or if you plan to multitask with Windows, Desqview, or OS/2, then you would best get a board that has a removable serial port chip, and separately purchase a National Semiconductor NS-16550-AFN chip to place into that socket, substituting the NS-16550-AFN for the chip that comes with the board. One place that sells them is 1-800-DIGIKEY. This is not vital for multitasking (or other) users of 2400 baud modems, but it IS important for users of 9600+ baud high speed modems. If you need to install an above mentioned board, then you should follow the instructions in the next section, since installing a serial port board is like installing an internal modem. If you need to purchase a cable for an external modem, do NOT get a so-called "null modem" cable. That is an entirely different kind of cable. What you DO want is a "straight through" or "extension" cable, also sometimes called a REGULAR modem cable. It will be a female on one end and a male on the other, since your PC's COM port is almost always male and modems are almost always female. If both your PC and your modem have 25-pin ports, then you need a cable with 25-pin ports. Same if they are both 9-pin. But if your PC has a 9-pin COM port and your modem is 25-pin, then you need a regular modem cable that is 9-pin female on one end and 25-pin male on the other, or else a 25-pin extension cable and a little 9-pin to 25-pin adapter. If you have BOTH a 9-pin COM port and a 25-pin COM port and you don't know which COM port you want to use, then I would recommend that you get both the 25-pin extension cable and the 9-pin to 25-pin adapter. It is common for one or more of the ports on the back of your PC to not be active or working properly, or labelled properly, so don't exhaust yourself trying to make a particular port work.

6.13. Installing an Internal Board

There is no difference in the rules regarding installation of an internal modem and installation of a serial port board for an external modem. An internal modem is in effect a serial port. Therefore, in the following discussion, I refer to "the board", which could designate either one. You canNOT always plug in the new board and expect it to work as-is. When you purchase a board to go inside a PC, the board comes with different optional settings, which have the purpose of allowing the user to customize the settings so that the new board does not conflict with the other components in the PC. There are three things you have to consider:

1. The first thing you should do is find out what hardware you have on your system. Diagnostic programs will reveal this. Before you run the diagnostic programs, you should activate all your hardware. For example, if you have a mouse, run your mouse driver. If you are on a local area network, then log in. This way, the diagnostic software is most likely to do a complete job at detecting your equipment. If you need assistance with diagnostic software, then you should call us voice at 202-466-6275 or log on to our BBS, go to the New Generation Computers section, and download SYSID5.EXE which is a 60K public domain diagnostic tool. (202-296-7778 for 2400 baud, 202-296-6305 for 9600+ baud.)

Once you find out this information, then find a free COM address and a free IRQ setting.

2. Second, your board must be given a unique address. The four addresses to choose from are "COM1" (or also known as 3F8 hex), COM2 (2F8), COM3 (3E8), and COM4 (2E8). For example, if you have a mouse on COM1, an empty COM2, and no COM3 or COM4, then you should set your modem to COM3 or COM4. (If more than one device has the same address, then when the software calls that address, two devices will answer at the same time, which will cause garbage data and probably a freeze-up.)
3. Third, you should be careful about the "interrupt request (IRQ)" setting of your board. Unlike with an address, two boards may share the same IRQ, but they cannot be active at the same time. Different hardware input devices take turns, using "interrupts." Those with a lower interrupt number are given priority, while those with a higher number are forced to wait until the other one is finished. However, if two devices have the same interrupt and both "get in line," then when it comes their turn, the two devices will talk at the same time which will cause garbage data and probably a

freeze-up.

The software makes certain "default" assumptions:

COM1 is at IRQ4

COM2 is at IRQ3

COM3 is at IRQ4

COM4 is at IRQ3

Try your best to use one of these settings. If you need to use IRQ5 or IRQ2, then you will have to change your Fossil driver from BNU to X00. (We packaged BNU with the Kit.)

Using the above settings, let's look at two examples:

Example #1: If you have a serial mouse on COM1 and a printer on COM2, then you should turn your printer off before you use your modem, and your board should be set for COM4 in order to keep from sharing an interrupt with your mouse.

Example #2: If you have a network board on IRQ3 (not a COM board, but an active board nonetheless), an empty COM1 port, nothing on IRQ4, and an internal modem to install, then you should install it on COM3 in order to avoid the interrupt of the network board.

If you must change the IRQ of another board in order to make room for your board, then be aware that you will probably have to reconfigure the software that went with that other board, e.g., a network driver. Software usually has to know what interrupt the hardware is on.

Further, you must avoid using IRQ5 on an XT with a hard disk, and you should avoid IRQ2 on a '286, '386 or '486 PC if you can. Conversely, IRQ5 is perfectly fine on a '286 or higher, and IRQ2 is perfectly fine on an XT.

Your board's settings will usually be changed by flipping switches or moving "jumpers", as will be explained in the manual (or sheet of paper, sometimes) that comes with the board.

Some boards will give additional options, like "forcing" things "high" (such as "Carrier Detect"). Do NOT force anything high.

When installing your board, make sure that your PC is turned off and everything is unplugged before you start installing the board. You should also keep touching the case in order to eliminate static electricity. When installing boards, be careful not to loosen any cables to

other boards or disk drives. Finally, when you put the cover back on, be careful not to snag any cables. It is very simple to install an internal board. You just plug it into ANY available slot. You remove the cover plate, and use the same screw to secure the modem. You should center the phone jack between the sides of the slot opening on the back of the PC before tightening the screw, so that the phone wire easily plugs and unplugs to/from the modem.

6.14. Plugging the Phone Cord Into The Modem

Finally, you will notice two jacks on the back of the modem. On many modems, you need to be careful which jack you plug the phone cord from the wall into. Usually, one jack will be marked "Wall" and the other will be marked "Handset" or something like that. If they are not marked, then you should consult your manual. If you can't find your manual, then you will have to use the trial & error method. In about 90% of all cases with internal modems, the cord that comes from the wall jack goes into the bottom, and the handset (if any) plug into the top. You can check to make sure the phone line itself is "live" by plugging a regular voice telephone into the other jack and listening for a dial tone.

6.2 Software settings for the right communications "port"

The only software in the PerManNet Kit that needs to know about your COM port settings is the FrontDoor network mailer. You will find out if your COM port is set properly the first time that you choose N for Network mode from the main START menu, which runs the FrontDoor on-line mailer. As you will see on the next screen, the FrontDoor mailer reports your modem's responses on the right side of the screen. If your software is set properly, then the right hand side of your screen will have at least one "OK" response from the modem.

If you got the "OK" responses as shown on the previous screen, then you do not need to read this document any further. If, however, you did not get any "OK" responses, then you apparently need to change your software settings, so read on.

6.3 Troubleshooting modem problems

6.31. No "OK"

The first thing you should do is run the selection on the menu that automatically tries running FrontDoor on the different COM ports, and automatically configures FrontDoor for the proper COM port. It says "Quick search for modem port (try COM1, COM2, ...)" The selection that got you here is directly above the one you want to try. If the search did not find any working COM ports, then you should return to this selection and read further. The automatic "Quick search" routine basically tries/tried all the COM ports, as will be discussed first:

1. **If you have your software set for the wrong COM port, then your modem will fail to initialize the modem.** The left side of the screen will show multiple attempts at "Initializing the modem" with no "OK" on the right side.

If you have this problem, then you need to change the COM port setting.

1. **Go to the START main menu and choose Configuration.**
2. **From the next menu choose the FrontDoor selection.**
3. **Within the FrontDoor selection, move to the Modem column; <Enter>.**
4. **Choose Hardware, <Enter>.**
5. **Choose a different modem port. Usually, you will be using either port 1, 2, 3, or 4.**

After changing the port, go back to the main menu, choose N for Network mode, and then see if it initializes the modem OK. If you try all four ports and still do not have any success, then you should call your hub operator for further assistance.

6.32. No Fossil Driver

Some people run FD.EXE from the DOS command line or their own personal batch file. Do be aware that you must run a FOSSIL driver before you run FD.EXE Note in START.BAT that the BNU.COM FOSSIL driver is loaded.

If you do not load BNU (or another FOSSIL driver) first, then FrontDoor will quit with an error message telling you that the FOSSIL driver was not found.

6.33. Pre-Determined Factory Settings

There are other problems which occur fairly often, due to the factory settings of some modems or ports.

1. Some modems start up assuming that they are already connected to another modem through the phone line. If you get a message on the left of "Carrier detected" and "Terminating call" before the modem even initializes, then you have one of these modems. Usually, this is just a temporary nuisance, as the FrontDoor network mailer sends certain commands to the modem within a minute, so that you should get an "OK" on the right hand side of the screen within a minute. (That command is AT&C1&D2.)

****Note:** Every time you turn off your modem (or your PC, if it is an internal modem), your modem will return to its default settings. After turning off your modem, and then re-starting your network mailer, the problem will recur, and it can get to be rather annoying over time. However, there are solutions:

1. If your modem has "non-volatile RAM" (NVRAM), then you can change its default settings.
 - a. Go to the DOS prompt. Type in the command CD\FD & <enter>.
 - b. Then run the command FD /T. You will eventually get a blank screen. Type in the command AT&C1&D2 & <enter>.
 - c. You should get a response of OK.
2. If you get no response then:
 - a. Type in the command AT&W & <Enter>. If you get a response of ERROR, then your modem does NOT have NVRAM. If you get a response of OK, then your modem is all set.

If your modem doesn't have NVRAM, but if you have a slow PC, then you can try entering the command ECHO AT&C1&D2>COM2 at the DOS prompt (if your modem is on COM2) or in your AUTOEXEC.BAT. Note: Do NOT put the &W command into the Init strings in the FrontDoor configuration program NOR into your AUTOEXEC.BAT! You can write settings to NVRAM only a few thousand times, on average, so do NOT make &W automatic in any way.

If the above problem persists and keeps cycling, or if the modem does not ever respond with an "OK", then you have one of four problems: a modem or port with hardware switches or jumpers set to force Carrier Detect (CD) high -- which you must fix an improper or bad cable (in

the case of an external modem) no modem at that particular port (try a different port)

6.34. No Dial Tone

If you are trying to send mail but get a modem response of "NO DIAL" or "NO DIAL TONE" (on the right hand side of the screen). This means one of five things:

- The phone line is dead
- The phone cord is damaged
- You plugged the phone cord into the wrong modem jack
- You are using an office phone system with a weird dial tone

Here's what you can do as regards the four problems: There are two jacks on the back of every modem. On many modems, you need to be careful which jack you plug the phone cord from the wall into, or else the modem will not interface with the phone system very well. Usually, one jack will be marked "Wall" and the other will be marked "Handset" or something like that. If they are not marked, then you should consult your manual. If you can't find your manual, then you will have to use the trial & error method. In over 90% of all cases with internal modems, the cord that comes from the wall jack goes into the bottom, and the handset (if any) plugs into the top. You can check to make sure the phone line itself is "live" by plugging a regular voice telephone into the other jack and listening for a dial tone. If you hear a dial tone by plugging your regular voice telephone into the other jack on the back of the modem, but your modem still reports "NO DIAL" or "NO DIAL TONE", then you have one of two problems: a bad modem, or a non-standard dial tone. If you are in an office environment or in a country with a phone system that is much different from the U.S. and Europe, then it is probably a nonstandard dial tone.

Both problems are easily fixed. From the START main menu, choose Configuration, then FrontDoor, then Modem, then Command Strings, then Init-2. Change any X commands to X3 within that long string. Alternatively, if you prefer, you can instead make the Init-3 string say ATX3! If that doesn't work, then consult your modem's manual for the proper "X" setting to disregard dial tone (but not other things).

Some other things that can screw you up: Some modems have switches (or jumpers) on them, which can force certain things high instead of allowing the software and the modem to control those parameters. The general rule of thumb is to change the switches to not "force" anything high or low. (But don't change ANY switches unless you are

experiencing problems — don't touch them if things work! And change one at a time!) Some office phones have nonstandard RING signals.

Conflicts with other hardware in your PC. See the section on hardware installation for a good list of hints. Some modems are just poor quality. If your modem is a high speed modem, then you may need to adjust the settings of your FOSSIL driver, which is BNU.COM in the START.BAT See the selection on high speed modems from the menu.

6.35. Rare cases

If your modem is set at COM3 or COM4, then there is a possibility that it is set for "IRQ5" or "IRQ2" or in rare cases a higher IRQ. (IRQ is Interrupt Request, as discussed briefly in the section on modem hardware.) If this is the case, then you will DEFINITELY need to adjust your FOSSIL driver, BNU.COM, which runs in START.BAT, or else replace it. **** I RECOMMEND REPLACING IT WITH X00 **** which you can get from PerManNet or download from many BBSes.

BNU assumes that COM1 and COM3 are at IRQ4, and COM2 and COM4 are at IRQ3. If this is not the case, then BNU will load but FrontDoor will not work. BNU.COM can be modified for other IRQ's by "patching" it, using the utility BNUPORT, included in \FD\DOCUMENT\BNU. However, you need to know the HEX value of your IRQ. Plus, read on: After all the trouble of patching BNU on occasion, I have had only marginal success with the patched versions of BNU. I strongly recommend that anyone using a non-standard IRQ switch to another FOSSIL driver called X00. Just throw away BNU and substitute X00.EXE in your START. You do NOT need to patch X00. All you need to do is specify the IRQ on the command line. X00 has always worked extremely well for me with a great variety of modems and PC equipment.

The current version at the time of this writing is version 1.24 Later versions of the PerManNet Kit will probably incorporate X00. (The reason why BNU is used is because certain clients requested it, since they were already familiar with it, and so it became established for the Kit. However, x00 is on the priority list ...). If you are running a multitasker, with a different communications program in a different memory partition, then be aware that the FOSSIL driver works by attaching itself to software interrupt 14h. (We are talking software interrupts here, not hardware interrupts as in the previous screen. 14hex is not to be confused with hardware IRQ 14, either.)

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If run run another serial communications program, then that other program will probably take over interrupt 14h. You can gain it back by either unloading and reloading BNU, or else by running BNU /C to recapture the interrupt without having to unload and reload. If you run multiple mailer lines, then you should run BNU once, before your multitasker, and then BNU /C in each mailer task.

There are other FOSSIL tricks which I have not discussed here (e.g., BNU.SYS vs. BNU.COM). I have declined to discuss them because they are much more rare and exceptional cases. Do be aware that there is a BNU echo on FidoNet (though it may no longer be on the backbone, in which case you would have to find its feed and distribution through the echolist available from 1:1/201). The same applies to x00. If you have tried all the hardware and software tricks I have mentioned and still have problems, then you probably want to contact us at PerManNet.

Appendix A: Article on “How Networks, Netmail and Conference Mail Work”

How Networks, NetMail and Conference Mail Work by Mark Prado

What is this Document?

This document explains how networks pass mail. It is one of the explanatory documents that is included in the “PerManNet Quick Startup Kit”; however, it is written so that it will be useful for people who do not use the kit.

WHO is this document for?

This document is written for the CURIOUS, the more technically inclined, hackers who want to customize their kit further, or any “system administrator” who may need to know the INNER workings of the PerManNet Kit -- the nitty gritty “behind the scenes” stuff.

WHAT is the purpose of this document?

This document is NOT meant as a substitute for the detailed technical manuals for each program contained within the kit. This document provides a somewhat technical overview and fills the gaps between the other documents by the original authors of the various modules. For more detailed information on any particular topic, one should refer to the manual of the appropriate program.

In the following discussions, I use the phrase “conference mail”.

Conference mail is the same thing as "echomail", "newsgroups", and anything else that other networks call conference mail, as long as you receive it bundled in "packet" format.

Packets

There are many different programs that conform to a certain standard called FTSC. Some are competitors to each other in serving a certain function (e.g., on-line mailers that compete with FrontDoor, such as BinkleyTerm, InterMail, D'Bridge, SEADOG, TIMS, Opus, Dutchie, MacWoof, Tabby, etc.), and some are "synergistic" -- meant to plug into each other in a modular way (e.g., an on-line mailer like FrontDoor and an offline conference mail processor like GEcho).

ALL brands of mailer automatically transfer information via modem in "packet" format, and most nonproprietary conference mail software exchanges information in the same packet packet format. All packets have a filename extension of PKT, and conform to the universal FTSC-001 standard. These packet files can be instructional code and/or data itself, and are processed by both the mailer and any underlying mail processing software.

Echomail files are initially stored in your inbound directory in packet format, though these packets may initially reside in a compressed file with a different filename extension, and transferred via modem in this compressed format using different filenames, as discussed later.

Echomail, netmail, file requests, and most everything else can be stored on your system in whatever non-packet format you wish, but when your mailer interfaces with other systems via modem -- sends and receives information -- it always creates and receives PKT files (though often compressed under a different filename).

For example, let's say you created four netmail messages all destined for one particular node. They were automatically stored on your PC's hard disk as four *.MSG messages, e.g., 3.MSG, 7.MSG, 18.MSG and 25.MSG. When you run your on-line mailer, it sees these four messages going to the same system and creates one packet with these four messages combined and reformatted into PKT format. (It may even delete some or all of the original four *.MSG messages after successfully sending them to the other system, depending upon whether you tagged them as Kill.) When the other system receives the PKT, it unpacks it, separates it into four messages and places them

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into its own messagebase in whatever format it prefers, which may not be the same *.MSG format you use on your system.

A partial exception is when files are sent and received, including compressed echomail archives, data files such as word processed documents and spreadsheets, software programs, etc. When you want to send a file to another system, FrontDoor creates a PKT file which tells the other system that it is about to send a file, after which the other system prepares to receive the file and names the file according to what the packet specified. In other words, data files like word processed documents and spreadsheets are NOT converted into PKT files, but are instead sent in native format, but are preceded by a PKT file telling the other system that you are sending a file in native format, and telling the other system the filename to store it as.

It is also possible for the other system to look at the PKT file and refuse to do what the PKT file wishes. If this is the case, it will usually send a PKT file back immediately, telling the sending system that it will not accept the transfer and to not attempt to continue the transfer. (This is sometimes done with very private systems, and sometimes done between certain hours when the system is expecting long distance calls and doesn't want to be tied up with large file transfers from local nodes.) As you can see, packets can be both instructional and data. In any event, they are the standard interface between systems conforming with the FTSC standard.

To be completely accurate, there are also other standards that exist which are not as universal as the "packet" standard. Examples include the "Arefix" and "AREAS.BBS" STORED file formats I will mention below. However, the packet standard is the one fundamental and universal standard between different brands of mailer DYNAMICALLY INTERACTING THRU A PHONE LINE, and many PKT files (especially instructional ones) are not ever stored onto disk by the receiving system.

How Conference Mail Works

Conference Mail is the most complex part of the kit, and is also the most automated part. The easiest way to explain it, in my opinion, is in a "cradle to grave" story.

First, a brief review of networks. There are many networks in the world. Each network carries a number of conferences. For example,

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one network may carry several conferences on different engineering specializations, another network may focus on conferences related to Third World issues, etc. Some networks, like FidoNet and UseNet, carry conferences on a wide range of topics. You rarely pick up all conferences for a particular network -- instead, you usually get only a few selected conferences, according to your choosing. We will be choosing certain conferences from the network FidoNet in the following example.

The heart of the PerManNet Quick Startup Kit's conference mail feature is a custom program written specifically for our kit called "Conference Manager" (or CONFMGR.EXE at the DOS level). Conference Manager can be run from the Configuration submenu. Conference Manager came to you already configured to hook into FidoNet and UseNet. What this means is that I provided you with a list of conferences offered by FidoNet and a list of conferences provided by UseNet -- two separate lists. I also set your software to use my node, 1:109/349, as your "uplink", with a password of FREEDOMS. You can change any of this, or add to it, of course, but let's use these for the following example. (You may see also the document CONFMGR.DOC in \FD\DOCUMENT\ONE-DOCS.)

OK, here we go:

1. You run Conference Manager. You choose the FidoNet list of conferences. You scroll up and down the list and find three particular conferences that interest you most. You tag them. They are: NUTRITION, BIOMED, and CARCINOMA. Then you save your decision and exit Conference Manager.
2. AUTOMATICALLY, Conference Manager will create a robot-to-robot message to your uplink, 1:109/349, requesting the above conferences. It does so by creating a message to "Areafix" (which is the standard name of an uplink's robot) at 1:109/349. The subject of the message is your password of "FREEDOMS" which I assigned to you. In the text of the message is a list of the conferences you wish to request from my system. If you wish, you can view this message if you go into the message editor before going on-line. (You could also have manually created this message.)
3. AUTOMATICALLY, the FrontDoor message viewer/editor will be told to add three new "Folders" for these three topics. You may notice this the next time you run the message editor. (Alternatively, you could have manually created these folders using

FDSETUP.EXE -> Manager -> Folders.)

4. AUTOMATICALLY, the GEcho message processor (discussed below) is told to expect to receive messages on these three topics. (Alternatively, you could have manually created these areas in GSetup -> Areas.)
5. You return to the main menu and go into Network mode -- fire up your modem and go on-line. Your FrontDoor mailer (FD) will automatically find the message addressed to 1:109/349 and hence automatically call my system and transfer the Areafix message, and then disconnect.
6. After disconnecting, my system unpacks the message received and, seeing that it's netmail, puts it into the netmail directory. My GEcho robot eventually runs and sees the message addressed to "Areafix", which tells it that it's a request by a "downlink". GEcho verifies your password and processes your request to start getting three more conferences -- NUTRITION, BIOMED, and CARCINOMA. From that point onward, whenever my system receives messages in any of those three conferences, it puts a copy of each message into a file addressed to you. This file accumulates over time, and is called a "mail bundle". (My system is more sophisticated and involved than your Startup Kit. If my system is not already receiving any of those conferences, then it automatically finds out who does get it, and in turn sends a request to that particular uplink of mine.) If your system is set up to receive calls, then my system will periodically deliver the accumulated "mail bundle" file to your FrontDoor and then start afresh with a new file. If your system is not set up to receive calls, then my system keeps your mail bundle on hold for your FrontDoor to call in and pick up. When my system creates a "mail bundle", what it is actually doing is creating a so-called "packet" file with the filename extension PKT. A large number of messages can fit into one PKT file. The PKT file conforms 100% to the FTSC standard for PKT files which is used by most competing software. When it is finished building up your PKT file, it compresses it (e.g., using PKZIP or PKARC) and gives it a special filename which is universally recognized as a compressed mail bundle -- having an extension using a day of the week and a number, e.g., for Tuesday it would be TU0 or TU1 or TU2, etc. This file is attached to a "Null" netmail message (i.e., a message with no text -- just source and destination information). If my system receives additional mail for relaying to you before transferring the existing file, then it will create another

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packet, and add that packet to the existing compressed file attached to the existing message. All this happens automatically.

7. Whenever your FrontDoor system connects with my FrontDoor system, there will usually be a mail transfer. A new compressed file will be transferred to your \FD\INBOUND directory. (The null message/netmail packet will be recognized as null by your FrontDoor and automatically deleted. The file is all that's kept.)

It would be a simple matter to have your FrontDoor/GEcho system automatically process the inbound mail bundle. However, there are also reasons to have you tell the software to process it from the PerManNet main menu, and the latter is the way we have set up the PerManNet Quick Startup Kit. So here's how you automatically unbundle incoming conference mail:

8. You go offline and return to the main menu. Then you choose selection B Bundle outbound or unbundle inbound mail which will give you a submenu, from which you choose U Unbundle inbound mail.

This will run the GEcho mail processor in such a manner (GECHO TOSS) that GEcho will look in your \FD\INBOUND directory for any files with a day-of-week extension, e.g., TU1, or else a PKT extension. If it has a day-of-week extension, then it will automatically determine what method of compression was used, automatically decompress the file into PKT form, and then process the PKT file--take messages out and put them into the "Hudson-style" messagebase files in \FD\ECHOMAIL. At this point, you are able to view and reply to messages using your message editor.

Let's say you use your message editor to create a message in a conference. What happens then? The message editor tags the message as "Local" and unsent.

9. You eventually exit the message editor. From the main menu, you choose the selection B Bundle outbound or unbundle inbound mail which will give you a submenu, from which you choose B Bundle outbound mail.

This will run the GEcho mail processor in such a manner (GECHO SCAN) that GEcho will scan your messagebase for messages that you have created, extract a copy of the new message, tag it as "Sent" in the messagebase header file, create (or add to) a PKT file, compress this file, put it into the \FD\OUTBOUND directory, and attach it to a

null netmail message addressed to my system, as discussed before.

Let's say it's time to kill old echomail. You run "Weekly maintenance" from the main menu. What happens then? The PerManNet Quick Startup Kit is set to automatically delete messages over 30 days old OR messages exceeding 400 in a conference (e.g., if 520 messages are found in a conference and all are less than 30 days old, then it deletes the oldest 120). These are the default settings. You can change these settings by choosing the Configuration submenu, and then GEcho Setup or GSetup. But for the following example, let's assume you don't change any of the defaults -- they remain at 30 days or 400 messages. You manually run the Weekly maintenance submenu, and then the selection D Delete old CONFERENCE messages GEcho automatically deletes old and/or excessive messages in each conference. Just like in a database, GEcho simply marks messages as "Deleted" -- it doesn't actually erase them. The data file remains the same size ... until GEcho "packs" it. (Alternatively, if you were to do it from DOS you would run MBUTIL PURGE PACK LINK in one command line.)

Let's say you want to stop receiving a conference. To do this, you would:

1. Run Conference Manager. Choose the "Kill conference(s)" option. Steps 2 thru 6 are analogous to steps 2 thru 6 above for adding a conference, except it deletes instead.

The Standard Message and Packet

According to the FTSC standard, each packet and message conform to a certain specifications. The packet includes the following:

1. A packet "header" identifying which address the packet came from, what software was used, and where the packet thought it was headed.
2. One or more messages (usually numerous conference messages). These messages may have originated on the sender's system and/or that of its relays and their relays, etc.

Each conference messages you receive should include all of the

following information, most of which is ignored during transit of the message thru hubs (but some of which is used), but most of which is used by the BBSes and message editors:

1. The conference, or "area tag".
2. The name of the sender.
3. The name of the recipient (or "all").
4. The subject of the message.
5. The address of the system in which the message originated.
6. The name of the system in which it originated (e.g., "XYZ Corporation").
7. A relatively unique message number. (rarely used by anything)
8. The text of the message.
9. "Seen-by lines" -- which list all systems that have seen the message so far.
10. The "Path" of the message so far.
11. The date of the message.

The conference mail software has a configuration file that lists all conference "areas" which it expects to receive mail for. This configuration file contains includes the following information:

1. Its own address (and AKA's, if any)
2. A list of conferences, and for EACH conference:
 - A. An "expert list" with the address(es) of any other nodes to which it is to relay messages in that particular conference. If you don't relay messages to anyone, then this would include only the system that feeds you.
 - B. Whether to place a copy of the messages into your message editor, or whether to only relay messages to others without keeping a copy ("passthru"), or both
 - C. Which AKA (if any) to use in the seen-by and path fields
 - D. Which AKA (if any) to use for messages you create

How Does It Work in the Network

There are two alternative ways that software works for relaying conference mail, which I will call the "Message Seen-By" and the "Packet Header" methods. Which way it works depends upon the software package. There are pro's and con's of both ways. I will explain the differences between the two methods after I explain what they have in common.

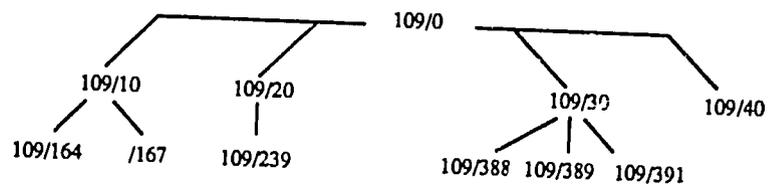
In both kinds of software, you specify everyone you send and receive mail to/from for each particular conference. This is called your "expert list", mentioned above. Whenever you create a message, a copy is

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eventually placed in the mail bundle(s) in your outbound directory destined for the node(s) you connect with for purposes of transferring mail for that particular conference(s).

You do NOT put in the address of everyone who receives your conference. You only put in the addresses of everyone you relay mail to. Most users will have only one address in their export list -- their local hub or their bossnode. A hub or bossnode, however, may have multiple people that they relay the message to. Let me explain:

Most networks are set up in a "Star" or pyramid configuration. Let's look at a small, simple, semi-fictional example. Let's say that we are in local net 109 and our node number is 1:109/164. Let's say we carry the local conference RESTAURANTS. Our net has several hundred nodes, numbered between 109/101 and 109/499. Nodes 101-199 use hub 10, nodes 201-299 use hub 20, etc., and the hubs in turn all connect to 109/0 as their hub in turn. Out of these several hundred nodes, only six nodes and one point currently carry RESTAURANT. In the following example, these are nodes 164, 167, 167.4, 239, 388, 389, and 391. Five hubs relay the this conference (along with other conferences you may carry, of course). Here's the "Star" topology:



Node 109/164 would have only node 109/10 in its export list. 109/10 would have only nodes 109/164, 109/167, and 109/0 in its export list. Node 109/167 would have only 109/10 and 109/167.4 in its export list. Node 109/0 would have only nodes 109/10, 109/20, and 109/30 in its export list, but not 109/40 for this particular conference.

Obviously, a node does NOT have to have all participants of a conference in its export list, only its relays. In the case of worldwide networks, this has clear cost advantages. When 109/30 receives a message from 109/388, 109/30 relays a copy of the message to 109/389, 109/391, and 109/0 but NOT back to 109/388 (to avoid duplicate messages).

There are two different ways that 109/30 could know to not send a duplicate message to 109/388. One way would be to look at the

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“packet header code” of the inbound packet, which identifies the sender of that packet. The other way is to look at the “seen-by” lines of each particular message in the packet to see all the nodes which have seen that message so far and compare all those nodes to its export list.

Now I will discuss the differences between the “message seen-by” and “packet header” methods. You will see that the packet header method is better for large networks and 4D points, and the software that processes the conference messages works faster, whereas the seen-by method offers a particular option which some very small local networks may prefer. In the following explanations, I will mention three parts of packets and conference messages which I listed in the previous section -- conference area tag of the message, the seen-by lines of the message, and the packet header.

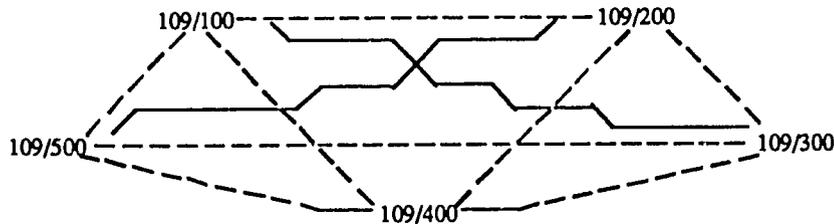
The earliest, small networks used the seen-by method, which uses the conference area tag and the seen-by lines but ignored the packet header. Most software still uses this method. When it receives a message, it looks at the conference area tag. Let's say it's DINING. Then it looks to see which systems are on the export list for DINING. Then it looks at the seen-by lines and compares those to the export list of its own configuration file. It sends a message to every system that is in the export list but which is not already in the seen-by lines. It sends the message by adding it to each outbound packet (and periodically creating new packets) destined for each system. When it copies a message to a packet, it copies all the seen-bys that it receives, plus it adds its own address to the seen-by line plus the addresses of the systems it is sending to (for reasons you'll see in a moment as regards “fully connected” topologies) but leaves out each individual recipient in the seen-by list. Then it looks at the next message in the inbound packet and repeats the process. Latter-day software ignores the seen-by lines, instead using the packet header. When it receives the packet, it puts the sender's address into its memory and then looks at each conference message, comparing the inbound packet header with the export list. Everything else is the same as in the case of the seen-by method.

The latter software, which uses packet headers, works faster. Also, in large networks, the list of seen-bys can become quite large, which increases the cost of long distance telephone calls and takes up more disk space for hubs. Indeed, some software offers to not put seen-bys into the message. Finally, the older seen-by method does not support 4D points or even 3D addresses because only 2D addresses may be put into seen-by lines according to current standards (and in order to

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prevent older software from crashing). Hence, systems that rely on 2D seen-by lines are often "zone-dumb" and can't see point numbers. Most of this software **REQUIRES** that all conference mail go thru a point's bossnode and that the bossnode have considerable expertise in setting up his software properly. The only software that **BOTH** uses seen-bys **AND** supports 4D and 3D addresses must use **BOTH** packet headers and seen-bys, and must conform to a star topology as concerns 3D and 4D addresses.

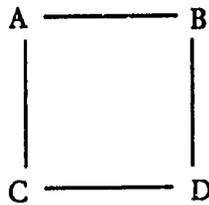
However, the packet header software can work **ONLY** in "star" topologies, according to the above example. Seen-by software can work in **BOTH** "star" and 2D "fully connected" topologies. "Fully connected" topologies are those whereby all conference participants are connected to each other, instead of using hub relays. An example of a "fully connected" topology:



Fully connected topologies are useful for small networks with little traffic. As long as each node isn't very busy, and as long as you don't mind your system placing numerous calls, messages can be delivered in a very timely fashion. However, if the other nodes are long distance calls, then this method is more costly than if you had only one hub. Also, if there's much traffic and systems are busy a lot, then this system can create a tremendous traffic jam, possibly resulting in slower message transit times.

Often, both seen-by and packet header software are used together on different nodes and hubs of a network, especially for intercontinental networks. In the above example of a fully connected topology, each node could be the "top of the star" for a continent. However, note that I used only 2D addresses in the above example, due to the 2D limitation on the seen-by standard. It's possible to use 2D software with 3D and 4D fully connected topologies, but it's a little tricky to do so, e.g., using AKA's. "Zonegates" also should strip out all seen-by lines from their own zone before sending to the next zone. In any fully connected topology, it is important that it be **FULLY** connected instead of partially connected. For example, consider the following case:

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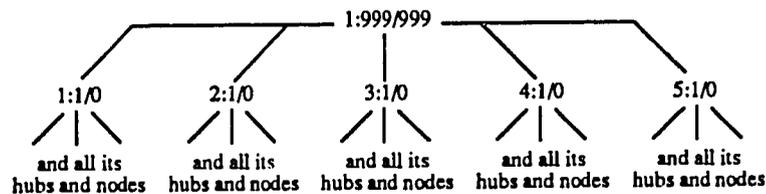


This square is a closed polygon that is not fully connected. It is capable of generating duplicates as follows:

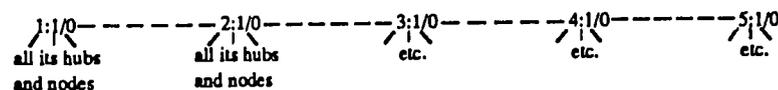
1. A message is entered on node A.
2. Node A exports the message to node B and node C placing the SEEN-BY for A, B, and C in the message as it does so.
3. Node B sees that node D is not listed in the SEEN-BY and exports the message to node D.
4. Node C sees that node D is not listed in the SEEN-BY and exports the message to node D.

At this point node D has received the same message twice - a duplicate was generated. Normally a "dupe-ring" will not be as simple as a square. Generally it will be caused by a system on one end of a long chain accidentally connecting to a system on the other end of the chain. This causes the two ends of the chain to become connected, forming a polygon.

If one instead used only packet header software in your entire network, with no seen-by software at all, then one could not have any "fully connected" hubs or nodes and there would need to be either a "master hub" for all continents, e.g.,



or else a "linear" topology between "top of the stars", e.g.:



Duplicate Messages

Duplicate messages can be generated by either faulty topologies and/or faulty software. The larger the network, and/or the greater the variety of software (since there are dozens of competing software packages, plus new "beta test" versions), the greater the risk of duplicates. Duplicate messages can cause traffic jams in the network, increase costs, fill up hard disks, and be annoying to users who see the same message over and over. It is vital that hubs use excellent software which will detect and trap duplicate messages. There are two ways to trap duplicates.

Software that uses seen-bys will not send messages out to other nodes if those other nodes are already on the seen-by line. Errors occur only if the seen-by line has been stripped out or truncated or corrupted. My experience in running a hub for the Washington D.C. area is that these problems with the seen-by line occur fairly common.

Software that uses packet headers must also use a "hash" system to detect duplicate messages. What this means is that a coded record is kept of all messages that have passed thru the system. The hash does a mathematical calculation based upon certain fields in a message that should not be changed by other software and which are unlikely to be corrupted. The largest hash I've seen to date (Spring 1992) keeps track of the last 32,767 messages. (The programs are GEcho and TosScan.) At least one software package, QMail, uses both seen-bys and a hash (16,000 messages).

Further, some hubs use additional software. For example, the program GMD (Grunged Message Detector) will detect messages that have been grunged, are relatively old (based on their date), or are non-standard. The hub operator may set up the software to either "bounce" the messages (i.e., return them to sender) or automatically delete them. Usually, this occurs at a mid-level hub, and never gets as high as a top star for a continent. There are also optional security provisions, both password and non-password. Sometimes it's built into the message processing software, sometimes it is in the mailer, and sometimes it is stand-alone software that is run in-between the mailer and the conference mail processing software.

The Path Line

Every system that relays either a conference mail message or a private netmail message is supposed to add its own address to a field called the "path". In conference mail, the path field is used to diagnose problems. Hub software generally does not delete duplicate or grunged messages, but instead puts them into a kind of "mail jail" and separates the duplicates from the grunged messages. It is up to the human operator to check out those messages and determine why they wound up there (e.g., bad network topology, grunged or nonstandard message, security violation, or operator error). For example, consider the following path:
PATH 109/102 10 0 396/1 999/999 396/1

This means that in net 109, it originated on 109/102 or one of its points, then went to 109/10, then to 109/0, then to 396/1, then to 999/999, and then back to 396/1. The error here is with 999/999 -- it is sending a duplicate message back to 396/1. Most low level hubs do not concern themselves too much with bad or duplicate messages as long as they occur only occasionally or are relatively small in number. Most low level hubs get their traffic from a large number of small nodes using a great variety of software and with a significant number of novice and/or experimental nodes. (As a hub, I spent my first week watching for duplicate and nonstandard messages, and after that only glanced on occasion.) However, higher level hubs usually get their mail from lower level hubs -- fewer connections, but more mail per connection. Higher level hubs generally encounter fewer duplicate or missing messages even though they are dealing with a much higher volume of traffic, because higher level hubs are dealing only with other experts who should have already "cleaned up" their mail, and a smaller number of such voluminous links.