

==Phrack Inc.==

Volume Three, Issue 27, File 1 of 11

Phrack Inc. Newsletter Issue XXVII Index

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June 20, 1989

Greetings and welcome to Issue 27 of Phrack Inc. The pressure is on with SummerCon '89 just a couple short days away. We're sorry it has taken so long to get this issue out, but summer break has created more responsibilities and busy schedules than we have ever had to deal with while in school. Still, I think you will agree that this issue was worth the wait.

This issue we feature a new updated NUA and Datex-P list from Oberdaemon of Switzerland and Chapter 7 of the Future Transcendent Saga (taking into account that the SPAN and NSFnet files were chapters 5 and 6). We also present the second part of the COSMOS file written by King Arthur.

Before we get to the main contents of the issue, we have a few comments to make regarding security and Phrack Inc.'s Internet access;

Thanks to a friend, we at Phrack Inc. have become aware of one of the main techniques that the National Security Agency (NSA) uses to perform surveillance on the wide area networks.

In certain messages that certain government agencies distribute, special phone numbers are included; WATS (800) numbers, to be more specific. As these messages are distributed around the continent via various netmail and file transfer schemes, they are passed through several surveillance stations. All of their stations perform one function, and in Unix terms, that function is called "grep."

Grep stands for G>lobal R>egular E>xpression search and P>rint. The grep does simple string matching. Every instance of these special 800-numbers in an email message (or batch of them) is flagged, recorded, and the record is mailed to certain intelligence agencies by the surveillance stations.

Here are the networks that we are reasonably certain that this practice is performed on:

- \* USEnet : Email is only checked in certain places, but ALL netnews (including alt and any other nonstandard newsgroups) are flagged by a single government domain SUN-3 that shall remain nameless.
- \* ARPAnet : All mail going through a standard BBN (Bolt, Bernack, and Neumann... a Cambridge/MIT spinoff) Internet controller will be flagged, but the only information recorded by the controller is the source and destination TCP/IP addresses of the message. But when you consider that this involves \*\*\*ALL\*\*\* DARPA mailing lists, you get a visualization of the magnitude. The reason more complex information is NOT recorded is that this network is the only AUTHORIZED place that these messages with the hot WATS are supposed to appear. You will see what this means in a moment.
- \* BITnet : Large IBM mainframe with I/O channel cycles to spare should have no problem scanning mail from one of the most publically accessible "free" networks.
- \* Fidonet : The Secret Service scans this for credit card and other violations. It is not too hard for them to check for the (800)'s, too.
- \* W.Union : All international telex lines are scanned to match a whole lot of stuff, especially drug-related information. The phone numbers are on their list.

We have other suspicions, but we are withholding them for now.

The other news is equally disturbing because it strikes us a little close to home. We are temporarily losing our network access. As of June 27, 1989 through August 28, 1989 we will not have access to our accounts on UMCVMB mainframe system. Make no attempt to mail us to our addresses there until August 28, 1989. However, every cloud has a silver lining and this is no exception. For networks people who wish to submit files to Phrack Inc. during this time period we proudly present our friend and associate, Hatchet Molly. He can be reached at "TK0GRM2@NIU.BITNET" and/or "TK0GRM2%NIU.BITNET@CUNYVM.CUNY.EDU".

So here is to another great issue of Phrack Inc!

Taran King

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#### Table of Contents:

1. Phrack Inc. XXVII Index by Taran King and Knight Lightning
  2. Operating The IBM VM/SP CP by Taran King
  3. Introduction To MIDNET: Chapter Seven Of The FTS by Knight Lightning
  4. NUA List For Datex-P And X.25 Networks by Oberdaemon
  5. COSMOS: COMputer System for Mainframe OperationS (Part Two) by King Arthur
  6. Looking Around In DECnet by Deep Thought
  7. The Making Of A Hacker by Framstag
  8. Sending Fakemail In Unix by Dark OverLord
  9. The Postal Inspection Service by Vendetta
  10. Phrack World News XXVII/Part 1 by Knight Lightning
  11. Phrack World News XXVII/Part 2 by Knight Lightning
  12. Phrack World News XXVII/Part 3 by Knight Lightning
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==Phrack Inc.==

Volume Three, Issue 27, File 2 of 12

Operating the IBM VM/SP CP

(IBM Virtual Machine System Product Control Program)

An information article researched by

Taran King

May 18, 1989

This article is for the purpose of understanding the Control Program (CP) portion of IBM's VM/SP. This is basically a separate section of VM/CMS known as CP (with full screen editors, the CP level is indicated in the lower right hand corner of the screen and for line-by-line editors, before the command line and after hitting carriage returns, it should say "CP") and it's purpose is to manage real resources. Any command that involves something outside of your virtual machine must communicate with CP. If CMS does not recognize a command you give it, it will give it to CP.

The user generally enters the CP stage after a program flops or if you get disconnected. You can also enter the CP stage by hitting PA1 which is a function key of sorts. PA1 toggles between CP and CMS while on-line and if you re-login after being disconnected, PA1 can be used besides the BEGIN command which will be spoken about later in this article.

Generally, VM/CMS systems are well equipped with help files so if anything I print becomes unclear to you, from CMS mode, type HELP CP XXX where XXX is the CP command you want information on.

To start this article off, I'm printing off the IBM-Defined Class and the Function Types as listed in the IBM VM/SP CP manual. This essentially tells you what privileges you have with your assigned class.

| IBM-Defined<br>Class | Function<br>Type | User &<br>Functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ~~~~~                | ~~~~~            | ~~~~~                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| A                    | O                | <p>Operations: The primary sysop can issue all class A commands. The class A user controls the VM/SP system. Class A is assigned to the user at the VM/SP system console during IPL. The primary sysop is responsible for the availability of the VM/SP system and its communication lines and resources. In addition, the class A user controls system accounting, broadcast messages, virtual machine performance options, and other command operands that affect the overall performance of the VM/SP. The sysop controls operation of the real machine using the system control panel and console device.</p> <p>NOTE: The class A sysop who is automatically logged on during CP initialization is designated as the primary sysop.</p> |
| B                    | R                | <p>Resource: The system resource operator can issue all class B commands. The class B user controls allocation and deallocation of all the real resources of the VM/SP system, except those controlled by the primary sysop and spooling operator.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| C                    | P                | <p>Programmer: The system programmer can issue all class C commands. The class C user updates certain functions of the VM/SP system. The system programmer can modify real storage in the real machine.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| D                    | S                | <p>Spooling: The spooling operator can issue all class D commands. The class D user controls spool data files and specific functions of the system's unit record equipment.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| E                    | A                | <p>Analyst: The system analyst can issue all class E commands. The class E user displays the contents of real storage, performs the functions required to generate saved systems and discontinuous saved segments, and controls the collecting and recording of performance measurement data. This class of</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |

user can display specified real storage areas on the virtual operator's console or on a spooled virtual printer, but cannot modify real storage.

|   |   |                                                                                                                                                                                                                                                                                                                                                                                                        |
|---|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F | C | Customer Engineer: The service representative can issue all class F commands. The class F user obtains, and examines, in detail, certain data about input and output devices connected to the VM/SP system. The service representative can establish extensive recording mode for one I/O device at a time and can cause the recording of repressible machine check errors to be initiated or resumed. |
|---|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |   |                                                                                                                                                                                                           |
|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| G | G | General: The general user can issue all class G commands. The class G user controls functions associated with the execution of his virtual machine. A general user cannot display or modify real storage. |
|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|     |     |                                                                                                                                                                                     |
|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANY | ANY | The ANY classification is given to certain CP commands that are available to any user. These are primarily for the purpose of gaining and relinquishing access to the VM/SP system. |
|-----|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

[illegible]

The following is the list of commands available along with a brief description as to what they do and/or formatting and then ending with the IBM-Defined Class and Function Type.

\* : From CP, one may use the \* command to annotate the terminal console sheet ~ or the terminal display screen with a comment. In other words, type \* and then any string of characters you would, for some reason, to be present on the screen thereafter.

```
Privilege Class:  ANY
Function Type:    N/A
```

```
#CP : This command is used to execute a CP Command while in a virtual machine
~~~  command environment without first signaling attention to get to the CP
command environment which means that when typing ^CP <command> to perform a CP
operation, CP directly receives the command whereas CP <command> merely queues
the command from CP.
```

```
Privilege Class: ANY
Function Type: ANY
```

ACNT : The ACNT command is used to create accounting records for logged on  
~~~~ users and to reset accounting data. It also closes a spool file that  
is accumulating accounting records.

```
Privilege Class: A
Function Type: 0
```

ADSTOP : The ADSTOP command is used to halt the execution of a virtual machine  
~~~~~ at a virtual instruction point. The hexloc variable may be placed  
after the word ADSTOP which is a 6 character hexadecimal representation of the  
virtual instruction address where the execution is to be halted. The OFF  
option of the ADSTOP command cancels any previous ADSTOP setting.

```
Privilege Class: G
Function Type: G
```

ATTN : Use the ATTN command to make an attention interruption pending at your  
~~~~ virtual console.

Privilege Class: G

Function Type: G

AUTOLOG : This command allows the user to log on any virtual machine defined  
~~~~~ in the directory.

Privilege Level: A, B

Function Type: O

BACKSPAC : The BACKSPAC command is used to restart or reposition the current  
~~~~~ output on a real punch or printer.

Privilege Class: D

Function Type: S

BEGIN or B : The BEGIN command by itself from CP mode will return the user to  
~~~~~ CMS mode in the place where he/she left off before he/she was  
disconnected or thrown into CP. The BEGIN command can also be followed by a  
hex location as to where to start in the case of the user wanting to be doing  
something other than what was previously occurring.

Privilege Class: G

Function Type: G

CHANGE or CH : In use of the CHANGE command, there are subcommands with  
~~~~~ variables. Generally, the "name" variable is 1 to 4 characters  
in length. The following are the subcommands with functions and formatting:

- o READER or RDR : changes reader spool files.
- o PRINTER or PRT : changes printer spool files.
- o PUNCH or PCH : changes punch spool files.
- o CLASS c1 : designates an existing class where c1 is a 1-character  
alphanumeric field from A to Z or 0 to 9.
- o spoolid : spoolid number of file that is to be changed.
- o FORM form1 : 1 to 8 character alphanumeric form name used to select files  
to be changed (form1).
- o ALL : changes all of your spool files.
- o HOLD : prevents a file from being printed, punched, or read until  
released.
- o NOHOLD : releases the specified file from the user's HOLD status.
- o DIST dist : changes the distribution code to variable "dist".
- o COPY(\*)nnn : specifies number of copies of the file you want spooled,  
which is valid only for printer or punch files. "nnn" is a  
number from 1 to 255 and the "\*" is present in the case of a  
3800 printer being used so that copies will be made in the  
printer internally.
- o FLASH name nnn : signifies that a form's overlay contained in the 3800  
printer is to be superimposed onto certain pages of  
output. "nnn" is a number from 0 to 255 representing  
the number of copies to be superimposed.
- o MODIFY name (n) : allows text alteration by preventing information  
printing or by adding labels to output. "n" selects a  
keyword in CHARS to be used for copy modification text.
- o CHARS name1 (name2(name3(name4)))  
CHARS name1(CH names2(CH names3(CH names4))) : specifies character  
arrangement table when printing a file. There can be  
up to 4 names.
- o FCB name : controls vertical spacing of output on a page.
- o FORM form2 : changes spool form name of file to form2.
- o NAME fn (ft) : assigns identification to spool file in CMS format  
filename and filetype.
- o NAME dsname : assigns identification to spool file in non-CMS format  
where "dsname" is from 1 to 24 characters, suitable for  
specifying OS or DOS files.

Privilege Class: S, G  
Function Type: D, G

CLOSE or C : The CLOSE command terminates spooling activity on any virtual  
~~~~~ spooled unit record or console device. It Contains the following  
subcommands to be followed by the letter C or the word CLOSE:

- o READER or RDR
- o PRINTER or PRT
- o PUNCH or PCH
- o FORM form1
- o HOLD
- o NOHOLD
- o DIST dist
- o NAME fn (ft)
- o NAME dsname
- o vaddr : virtual address (cuu) of device to be closed.
- o CONSOLE : closes virtual machine's console spool file which makes it a  
printer spool file.
- o PURGE : closes and immediately purges from the virtual machine the  
output spool files. No output file is produced.
- o CHAIN : only valid for VM/SP HPO Release 4.2 and Profs Spool File  
Enhancement PRPQ. Indicates that the punchfile is to be  
chained.

Privilege Class: G  
Function Type: G

COMMANDS or COMM : Use COMMAND to list the commands and diagnose codes you are  
~~~~~ authorized to use.

Privilege Class: ANY  
Function Type: ANY

COUPLE : Using the COUPLE command connects your virtual non-dedicated  
~~~~~ channel-to-channel device to another user's virtual device of the  
same type or to another one of your own virtual devices of the same type. The  
format of this command is in the form of COUPLE vaddr1 TO userid vaddr2. The  
variable vaddr1 is your virtual address and the variables userid vaddr2  
identify the userid and virtual address of that userid to be connected to.

Privilege Class: G  
Function Type: G

CP : The CP command may precede the command to be processed, but it is not  
~~ necessary. Generally, the CP command is used from CMS mode to queue CP  
functions by typing CP <command>.

Privilege Class: ANY  
Function Type: ANY

CPTRAP : The CPTRAP command creates a reader file of a selected trace table,  
~~~~~ CP interface, and virtual machine interface entries for problem  
determination.

Privilege Class: C  
Function Type: P

DCP : This command displays the contents of real storage locations at the  
~~~ terminal.

Privilege Class: C, E  
Function Type: P

DEFINE or DEF : The DEFINE command in CP is used to alter your virtual machine  
~~~~~ configuration or channel operating mode. There are a LOT of  
subcommands that are used with the DEFINE command such as RDR or PRT or PCH  
and the list goes on and on. If you want details, there is a help file (type  
HELP CP DEF) that is almost 600 lines that goes into detail on each

subcommand.

Privilege Class: B, G

Function Type: R, G

DETACH or DET : The DETACH command is used to remove a virtual device from the  
~~~~~ virtual machine. The subcommands are as follows:

- o vaddr (vaddr...) : used for multiple addresses to be detached where vaddr  
is the virtual address (cuu) of the device to be  
detached.
- o vaddr-vaddr : used to detach a range of addresses.
- o CHANNEL c : detaches the real address of the channel.

Privilege Class: B, G

Function Type: R, G

DIAL : Using the DIAL command logically connects a switched line, leased line,  
~~~~~ locally attached, or remote Binary Synchronous (BSC) terminal to a  
previously logged-on multiple-access virtual machine. It is in the format of  
DIAL userid (vaddr) where the userid is that to be connected to and the  
vaddr is the optional virtual address.

Privilege Class: ANY

Function Type: ANY

DISABLE : The DISABLE command prevents low speed communications lines from  
~~~~~ accessing the system.

Privilege Class: A, B

Function Type: R

DISCONN or DISC : The DISCONNECT command is used to disconnect your terminal  
~~~~~ from the system while the virtual machine continues  
operation. Using the DISC HOLD or DISC HO option, you specify that the  
communications line is not to be disabled which allows you to avoid re-dialing  
the system.

Privilege Class: ANY

Function Type: ANY

DISPLAY or D : The DISPLAY command allows you to display virtual machine  
~~~~~ components at your terminal. Depending on what variable  
follows the D or DISPLAY command from CP, you can display virtual storage  
locations, storage keys, general registers, floating-point registers, control  
registers, vector registers, VAC (Vector Activity Counter), VSR (Vector Status  
Register), VMR (Vector Mask Register), PSW (Program Status Word), CAW (Channel  
Address Word), and CSW (Channel Status Word).

Privilege Class: G

Function Type: G

DMCP : This command prints the contents of real storage locations on a user's  
~~~~~ virtual spooled printer.

Privilege Class: C, E

Function Type: P

DRAIN : The DRAIN command stops spooling operations on a specified real unit's  
~~~~~ read devices after the file currently being processed has been  
completed.

Privilege Class: D

Function Type: S

DUMP or DU : Use the DUMP command to print the contents of various components  
~~~~~ of the virtual machine on the virtual spooled printer. Depending  
on what variable is placed after the DUMP or DU command, the items printed  
include virtual PSW (Program Status Word), general registers, floating-point  
registers, control registers, storage keys, and virtual storage locations.

Privilege Class: G

Function Type: G

ECHO or EC : Defaulted at 1, the ECHO command places the terminal in the echo  
~~~~~ environment in which any line entered is transmitted unchanged  
back to the terminal a specified number of times, depending on the variable  
entered immediately after the word ECHO or EC.

Privilege Type: G

Function Type: G

ENABLE : Use the ENABLE command to enable the previously disabled or nonabled  
~~~~~ devices so users may access the system.

Privilege Class: A, B

Function Type: R

EXTERNAL or EXT : The EXTERNAL command allows the user to simulate an external  
~~~~~ interrupt to the virtual machine and to return control to  
that machine. The hexadecimal code following the word EXTERNAL or EXT is  
associated with the external interrupt, the default being the number 40 which  
is associated with the external interrupt button on a system console.

Privilege Class: G

Function Type: G

FLUSH : The FLUSH command halts and immediately purges on hold the current  
~~~~~ output on a specified unit record device.

Privilege Class: D

Function Type: S

FORCE : This command forces a logoff of any user of the system.

~~~~~

Privilege Class: A

Function Type: O

FREE : Use the FREE command to remove a set of spool files belonging to a  
~~~~~ specified user from a system hold status.

Privilege Class: D

Function Type: S

HALT : The HALT command terminates any active channel program on a specified  
~~~~~ real device.

Privilege Class: A

Function Type: O

HOLD : The HOLD command places user spool files in a system hold status.

~~~~~

Privilege Class: D

Function Type: S

INDICATE or IND : At your terminal, you can display the use of and contention  
~~~~~ for major system resources with the INDICATE command. The  
following variables that follow the word INDICATE or IND show the following  
data:

- o LOAD : shows number of users in queue 1 and queue 2, the usage of real  
storage, and the ratio of active users to users being serviced.  
This is done by returning values that indicate operating load on  
the system.
- o USER : displays the amounts of system resources used by your virtual  
machine in the current terminal session.

Privilege Class: A, E, G

Function Type: O, A, G

IPL or I : Generally used to return to CMS via the IPL CMS or I CMS command,  
~~~~~ the IPL command simulates an initial program load function for a



virtual machine. Subcommands are as follows:

- o vaddr : virtual address (cuu) of the device that contains the nucleus to be loaded.
- o cylno : cylinder containing the IPL data which defaults to 0.
- o nnnnn : block address containing the IPL data which defaults to 0.
- o CLEAR : sets virtual storage space to binary zeros before the operating system is loaded.
- o NOCLEAR : allows contents of your virtual storage space to remain unchanged prior to program load.
- o STOP : halts the virtual machine during the IPL procedure just before the initial PSW is loaded.
- o ATTN : generates an attention interrupt to the virtual machine during the IPL procedure.
- o PARM pl (p2...) : processes up to 64 bytes of data to your virtual machine's general registers starting with the high order byte of general register 0.
- o systemname : simulates IPL function when loading a named system that was previously saved.

Privilege Class: G

Function Type: G

LINK : The LINK command is used to make a device that is associated with ~~~~ another virtual machine available at your virtual machine configuration based upon info in that user's directory entry. This command is in the format of LINK TO userid vaddr1 AS vaddr2 (mode) ((PASS=) password(1)).

Privilege Class: G

Function Type: G

LOADBUF : On a 1403 printer, the LOADBUF command loads the Universal Character ~~~~~~ Set (UCS) with a specified print train or chain image. On a 3203, 3211, 3212, 4245, or 4248 printer, it loads the UCS or the Forms Control Buffer (FCB) with a specified image. On a 3289 Model 4 printer, it loads the Font Offset Buffer (FOB) with the image print belt and the FCB.

Privilege Class: D

Function Type: S

LOADVFCB : This command specifies the forms control buffer image for different ~~~~~~ virtual spooled printers. The variables that follow it include:

- o vaddr
- o FCB : required reserved keyword meaning Forms Control Buffer.
- o name : a name that is system defined.
- o INDEX (nn) : place initial printing position in number nn for the 3211 printer.

Privilege Class: G

Function Type: G

LOCATE : Use the LOCATE command to find the addresses of CP control blocks ~~~~~~ associated with a particular user, a user's device, or a real system device.

Privilege Class: C, E

Function Type: P

LOCK : This command permanently locks in selected pages of real storage. ~~~~

Privilege Class: A

Function Type: O

LOGOFF or LOGOUT or LOG : Used to terminate a virtual machine session and ~~~~~~ disconnect your virtual machine from the system, this command can be used with the HOLD option (i.e. LOG HOLD) for retaining the connection allowing for a switched communications line to enable one to

log on without re-dialing the system.

Privilege Class: ANY

Function Type: ANY

LOGON or LOGIN or L : Obvious enough, the LOGIN or LOGON command is used to  
~~~~~ identify yourself to the system and to access that  
system. Following the words LOGIN or LOGON or L, type your userid which is  
the identifier assigned to you in the system. If the system you are logging  
onto does NOT have password suppression, your password can follow directly  
after your userid. NOTE: If the system you are on does have password  
suppression (i.e. it does not echo to your screen what you type when you type  
your password), you will get a system error message if you try to put it on  
the same line as your userid. The NOIPL option, which would follow your  
password and userid, specifies that the IPL device or name in the directory  
should not be used for an automatic IPL.

Privilege Class: ANY

Function Type: ANY

MESSAGE or MSG or M : Use the MESSAGE command to transmit message text to a  
~~~~~ specified userid or to the primary system operator  
userid. MSG userid msgtext sends msgtext to the userid specified after  
userid. If userid is replaced with \*, the text is sent to yourself. Also, if  
the userid is replaced with OPERATOR, the message text is sent to the primary  
system operator regardless of his userid.

Privilege Class: A, B, ANY

Function Type: O, ANY

MIGRATE : The MIGRATE command activates the normal page/swap table migration  
~~~~~ routines or forces a particular user's pages to a secondary device  
even if that user is currently active.

Privilege Class: A

Function Type: O

MONITOR : To initiate or override the system-generated function or to  
~~~~~ terminate the recording of events occurring in the real machine, use  
the MONITOR command.

Privilege Class: A, E

Function Type: O

MSGNOH : The MSGNOH command allows a service virtual machine to send messages  
~~~~~ to specified users without the standard header associated with the  
MESSAGE command.

Privilege Class: B

Function Type: R

NETWORK : The NETWORK command allows you to load, dump and control operation  
~~~~~ of a 3704 or 3705 and to control operation of a 3725 control program  
operating in 270x emulation mode (EP). Also, it allows control of remote 3270  
devices via binary synchronous lines.

Privilege Class: A

Function Type: O

NOTREADY or NOTR : Using the NOTREADY command causes the virtual device, which  
~~~~~ is specified after the NOTREADY statement via cuu address,  
to appear as if it had changed from ready to not ready status.

Privilege Class: G

Function Type: G

ORDER or ORD : ORDER is used to place your closed spool files in a specific  
~~~~~ order by device type. These spool files include READER,  
PRINTER, and PUNCH files and can be sorted by CLASS, FORM, and spoolid.

Privilege Class: D, G

Function Type: S, G

PER : PER allows one to monitor certain events as they occur during program  
~~~ execution in the user's virtual machine. This command can monitor the  
fetching and execution of an instruction, the execution of a successful branch  
instruction, the instruction of an instruction that alters a specific general  
purpose register, and the execution of an instruction in the virtual machine  
that alters storage.

Privilege Class: A, B, C, D, E, F, G

Function Type: G

PURGE or PUR : Use the PURGE command to remove your own closed spool files  
~~~~~ from the system before they are printed or punched by the  
spooling devices, or before they are read by a user. The spool file  
specifications include READER, PRINTER, and PUNCH files as well as the ALL  
option which purges all of the above mentioned files.

Privilege Class: D, G

Function Type: S, G

QUERY or Q : Also available in CMS mode, the QUERY command is used to  
~~~~~ determine your system status and machine configuration.  
Although there are far too many subcommands of the QUERY command, the  
following is a list of items that may be queried. I recommend, for full  
detail, using the HELP CP QUERY command as it is quite thorough (over 1000  
lines) in explaining the QUERY command.

- o The time you have used during a terminal session.
- o The number of closed input and output spool files associated with  
your virtual machine.
- o The current settings of the color and/or extended highlight values  
in effect for your virtual machine console.
- o The current settings of the SET command functions.
- o The current settings of the TERMINAL command functions.
- o The status of all the devices on your virtual machine.
- o The channel operating mode of your virtual machine, whether  
block-multiplexer or selector.
- o A listing of all users who are linked to a given virtual address,  
together with their device addresses and access modes.
- o Display of the secondary user (secuser) that is specified in the  
CONSOLE directory statement.
- o Identification and attributes associated with your virtual  
PRINTER, PUNCH, and READER spool files.
- o The identification of your virtual processor.
- o The mode of processor operation of your VM/SP HPO installation:  
uniprocessor mode (UP), attached processor mode (AP), or  
multiprocessor mode (MP).
- o The userid and system identifier.
- o A listing of the PER traceset elements.
- o The log messages of the day.
- o The names of the users that are logged on.
- o The number of users that are logged on or dialed to the system.

NOTE: There are other operands you can use with the QUERY command if you  
have the privilege class required to use them.

Privilege Class: A, B, C, D, E, F, G

Function Type: O, R, P, S, A, C, G

QVM : Use this command to request the transition from the VM/SP environment to  
~~~ native mode for a particular virtual machine.

Privilege Class: A

Function Type: O

READY : In the format of READY vaddr, this command is used to set a device-end  
~~~~~ interruption pending for the specified virtual device.

Privilege Class: G  
Function Type: G

REPEAT : Use the REPEAT command to increase the number of copies of an output  
~~~~~ file or to place the current output file in a hold status increasing  
or not increasing the number of copies to be created.

Privilege Class: D  
Function Type: S

REQUEST or REQ : Simply use the REQUEST command to make an attention interrupt  
~~~~~ at your virtual console.

Privilege Class: G  
Function Type: G

RESET : Also in the format of RESET vaddr, this command is used to clear all  
~~~~~ pending interrupts from the specified virtual device.

Privilege Class: G  
Function Type: G

REWIND or REW : The REWIND command is used to rewind a real tape unit attached  
~~~~~ to your virtual machine at a specified virtual device address  
in the format REWIND vaddr.

Privilege Class: G  
Function Type: G

SAVESYS : This command allows you to save a virtual machine storage space with  
~~~~~ registers and the PSW as they currently exist. It is used in the  
process of creating named systems.

Privilege Class: E  
Function Type: A

SCREEN or SCRE : Use the SCREEN command to alter or change any extended color  
~~~~~ and/or extended highlight definitions for your virtual  
machine console. You may issue the command from any IBM supported terminal or  
from a PROFILE EXEC because the SCREEN command is not device dependent.  
However, the SCREEN command is only valid when the Extended Color Feature has  
been applied to the terminal controller.

You can assign extended color and extended highlighting values to six distinct  
display screen areas: the input area, the system status area, and the output  
area that encompasses three other areas: CP output, virtual machine output,  
virtual machine output, and an input redisplay area. The physical attributes  
of 3270 Information Display station screens vary according to model.

Because this command mainly applies to people who are not on dial-up, I have  
elected not to detail all of the variables available with the SCREEN command.  
Once again, I recommend you using HELP CP SCREEN for details.

Privilege Class: G  
Function Type: G

SEND : Using the Single Console Image Facility, the SEND command is used to  
~~~~~ pass commands and message replies for the secondary user's console to  
disconnect virtual machines for execution. This command is executed in the  
format: SEND (CP) userid (text).

Privilege Class: G  
Function Type: G

SET : Use the SET command to control various functions within your virtual  
~~~ system. This command has a large number of variables that can be SET  
and details for each of the variables can be obtained from the HELP CP SET  
file.

Privilege Class: A, B, E, F, G  
Function Type: O, R, A, C, G

SHUTDOWN : This command, of course, systematically ends all virtual machine  
~~~~~ functions and checkpoints the system for an eventual warm start.

Privilege Class: A

Function Type: O

SLEEP or SL : To place the virtual machine in a dormant state but allow  
~~~~~ messages to be displayed, use the SLEEP command in the format  
of SLEEP nn (time-specification) where time-specification is SEC for seconds,  
MIN for minutes, or HR for hours and nn is the number of the amount of time  
for the machine to be in dormant state.

Privilege Class: G

Function Type: G

SMSG or SM : The SMSG command is used to send a special message to a virtual  
~~~~~ machine programmed to accept and process the message. The format  
of this command is SMSG userid msgtext where userid is the userid to receive  
the message and msgtext is the message to be sent to the userid.

Privilege Class: G

Function Type: G

SPACE : Use the SPACE command to force the output on a specified printer to be  
~~~~~ single spaced for the current active spool file regardless of the  
carriage control commands in the actual file.

Privilege Class: D

Function Type: S

SPMODE : SPMODE allows the system operator to establish or reset the single  
~~~~~ processor mode environment.

Privilege Class: A

Function Type: O

SPOOL or SP : Use the SPOOL command to modify the spooling control options in  
~~~~~ effect for a given virtual spooling device or for a group of  
devices. The SPOOL command can also start or stop the spooling of virtual  
console input and output. You can direct a file to a remote location by using  
the SPOOL command in conjunction with the TAG command.

Privilege Class: G

Function Type: G

SPTAPE : Use this command to dump spool files to tape or to load spool files  
~~~~~ from tape.

Privilege Class: D

Function Type: S

START : The START command restarts a spooling device after it has been drained  
~~~~~ or changes the output class that it may service.

Privilege Class: D

Function Type: S

STCP : To alter the contents of real storage but not real PSW or real  
~~~~~ registers, use the STCP command.

Privilege Class: C

Function Type: P

STORE or ST : The STORE command is used to alter the contents of specified  
~~~~~ registers and locations of the virtual machine. As well as  
saving virtual machine data in low storage, the contents of the following can  
be altered:

- o Virtual storage locations
- o General registers
- o Floating-point registers

- o Control registers
- o Program Status Word (PSW)

Privilege Class: G

Function Type: G

SYSTEM or SYS : SYSTEM is used to simulate the action of the RESET and RESTART ~~~~~~ buttons on the real computer console, and to clear storage.

The variables are as follows:

- o CLEAR : clears virtual storage and virtual storage keys to binary zeros.
- o RESET : clears all pending interrupts and conditions in the virtual machine.
- o RESTART : simulates the hardware system RESTART function by storing the current PSW at virtual location eight and loading, as the new PSW, the doubleword from virtual location zero.

Privilege Class: G

Function Type: G

TAG or TA : The TAG has many different variables that can be tagged, which are ~~~~~~ too many to list here because of different settings for each one, but it is used to associate file descriptive information with a spool file.

Privilege Class: G

Function Type: G

TERMINAL or TERM : The TERMINAL command is used to control the following ~~~~~~ functions associated with your virtual console:

- o Logical line-editing symbols
- o Masking of password
- o The APL character set
- o The Text character set
- o Signaling of an attention interrupt
- o Attention handling mode for your virtual console
- o Line length for output on your virtual console
- o Specifying terminal device type as 3101 or TTY
- o Location of cursor preceding terminal read
- o Scrolling rate for 3101 terminal

Privilege Class: G

Function Type: G

TRACE or TR : Use the TRACE command to trace specified virtual machine ~~~~~~ activity and to record the results at the terminal, on a virtual spooled printer, or on both terminal and printer. If you issue more than one TRACE command, the operands are cumulative; that is, operands specified for the first time are activated, whereas those specified with new modifiers are updated. The RUN and NORUN operands, however, can be specified in different tracing functions and do not cause a conflict.

You cannot issue the TRACE command while preferred machine assist is operating, whether or not you have enabled the preferred machine assist feature's control switch assist.

Privilege Class: G

Function Type: G

TRANSFER or TRAN : This command is used to transfer your closed spool files to ~~~~~~ a specified user or queue, or to reclaim closed spool files that you created.

Privilege Class: D, G

Function Type: S, G

UNLOCK : Use the UNLOCK command to unlock page frames previously locked by a ~~~~~~ LOCK command.

Privilege Class: A



If you are not already familiar with NSFnet, I would suggest that you read:

"Frontiers" (Phrack Inc., Volume Two, Issue 24, File 4 of 13), and definitely;  
"NSFnet: National Science Foundation Network" (Phrack Inc., Volume Three,  
Issue 26, File 4 of 11).

#### Table Of Contents

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- \* Introduction
- \* The DOD Protocol Suite
- \* Names and Addresses In A Network
- \* Telnet (\*NOT\* Telenet)
- \* File Transfer
- \* Mail

#### Introduction

~~~~~

MIDNET is a regional computer network that is part of the NSFnet, the National Science Foundation Network. Currently, eleven mid-United States universities are connected to each other and to the NSFnet via MIDnet:

UA - University of Arkansas at Fayetteville  
ISU - Iowa State University at Ames  
UI - University of Iowa at Iowa City  
KSU - Kansas State University at Manhattan  
KU - University of Kansas at Lawrence  
UMC - University of Missouri at Columbia  
WU - Washington University at St. Louis, Missouri  
UNL - University of Nebraska at Lincoln  
OSU - Oklahoma State University at Stillwater  
UT - University of Tulsa (Oklahoma)  
OU - University of Oklahoma at Norman

Researchers at any of these universities that have funded grants can access the six supercomputer centers funded by the NSF:

John Von Neuman Supercomputer Center  
National Center for Atmospheric Research  
Cornell National Supercomputer Facility  
National Center for Supercomputing Applications  
Pittsburgh Supercomputing Center  
San Diego Supercomputing Center

In addition, researchers and scientists can communicate with each other over a vast world-wide computer network that includes the NSFnet, ARPAnet, CSnet, BITnet, and others that you have read about in The Future Transcendent Saga. Please refer to "Frontiers" (Phrack Inc., Volume Two, Issue 24, File 4 of 13) for more details.

MIDnet is just one of several regional computer networks that comprise the NSFnet system. Although all of these regional computer networks work the same, MIDnet is the only one that I have direct access to and so this file is written from a MIDnet point of view. For people who have access to the other regional networks of NSFnet, the only real differences depicted in this file that would not apply to the other regional networks are the universities that are served by MIDnet as opposed to:

NYSERnet in New York State  
SURAnet in the southeastern United States  
SEQSUInet in Texas  
BARRnet in the San Francisco area



MERIT            in Michigan

(There are others that are currently being constructed.)

These regional networks all hook into the NSFnet backbone, which is a network that connects the six supercomputer centers. For example, a person at Kansas State University can connect with a supercomputer via MIDnet and the NSFnet backbone. That researcher can also send mail to colleagues at the University of Delaware by using MIDnet, NSFnet and SURAnet. Each university has its own local computer network which connects on-campus computers as well as providing a means to connecting to a regional network.

Some universities are already connected to older networks such as CSnet, the ARPAnet and BITnet. In principal, any campus connected to any of these networks can access anyone else in any other network since there are gateways between the networks.

Gateways are specialized computers that forward network traffic, thereby connecting networks. In practice, these wide-area networks use different networking technology which make it impossible to provide full functionality across the gateways. However, mail is almost universally supported across all gateways, so that a person at a BITnet site can send mail messages to a colleague at an ARPAnet site (or anywhere else for that matter). You should already be somewhat familiar with this, but if not refer to;

"Limbo To Infinity" (Phrack Inc., Volume Two, Issue 24, File 3 of 13) and  
"Internet Domains" (Phrack Inc., Volume Three, Issue 26, File 8 of 11)

Computer networks rely on hardware and software that allow computers to communicate. The language that enables network communication is called a protocol. There are many different protocols in use today. MIDnet uses the TCP/IP protocols, also known as the DOD (Department of Defense) Protocol Suite.

Other networks that use TCP/IP include ARPAnet, CSnet and the NSFnet. In fact, all the regional networks that are linked to the NSFnet backbone are required to use TCP/IP. At the local campus level, TCP/IP is often used, although other protocols such as IBM's SNA and DEC's DECnet are common. In order to communicate with a computer via MIDnet and the NSFnet, a computer at a campus must use TCP/IP directly or use a gateway that will translate its protocols into TCP/IP.

The Internet is a world-wide computer network that is the conglomeration of most of the large wide area networks, including ARPAnet, CSnet, NSFnet, and the regionals, such as MIDnet. To a lesser degree, other networks such as BITnet that can send mail to hosts on these networks are included as part of the Internet. This huge network of networks, the Internet, as you have by now read all about in the pages of Phrack Inc., is a rapidly growing and very complex entity that allows sophisticated communication between scientists, students, government officials and others. Being a part of this community is both exciting and challenging.

This chapter of the Future Transcendent Saga gives a general description of the protocols and software used in MIDnet and the NSFNet. A discussion of several of the more commonly used networking tools is also included to enable you to make practical use of the network as soon as possible.

#### The DOD Protocol Suite

~~~~~

The DOD Protocol Suite includes many different protocols. Each protocol is a specification of how communication is to occur between computers. Computer hardware and software vendors use the protocol to create programs and sometimes specialized hardware in order to implement the network function intended by the

protocol. Different implementations of the same protocol exist for the varied hardware and operating systems found in a network.

The three most commonly used network functions are:

Mail               -- Sending and receiving messages  
File Transfer   -- Sending and receiving files  
Remote Login   -- Logging into a distant computer

Of these, mail is probably the most commonly used.

In the TCP/IP world, there are three different protocols that realize these functions:

SMTP    -- (Simple Mail Transfer Protocol) Mail  
FTP      -- (File Transfer Protocol) sending and receiving files  
Telnet   -- Remote login

How to use these protocols is discussed in the next section. At first glance, it is not obvious why these three functions are the most common. After all, mail and file transfer seem to be the same thing. However, mail messages are not identical to files, since they are usually comprised of only ASCII characters and are sequential in structure. Files may contain binary data and have complicated, non-sequential structures. Also, mail messages can usually tolerate some errors in transmission whereas files should not contain any errors. Finally, file transfers usually occur in a secure setting (i.e. The users who are transferring files know each other's names and passwords and are permitted to transfer the file, whereas mail can be sent to anybody as long as their name is known).

While mail and transfer accomplish the transfer of raw information from one computer to another, Telnet allows a distant user to process that information, either by logging in to a remote computer or by linking to another terminal. Telnet is most often used to remotely log in to a distant computer, but it is actually a general-purpose communications protocol. I have found it incredibly useful over the last year. In some ways, it could be used for a great deal of access because you can directly connect to another computer anywhere that has TCP/IP capabilities, however please note that Telnet is \*NOT\* Telenet.

There are other functions that some networks provide, including the following:

- Name to address translation for networks, computers and people
- The current time
- Quote of the day or fortune
- Printing on a remote printer, or use of any other remote peripheral
- Submission of batch jobs for non-interactive execution
- Dialogues and conferencing between multiple users
- Remote procedure call (i.e. Distributing program execution over several remote computers)
- Transmission of voice or video information

Some of these functions are still in the experimental stages and require faster computer networks than currently exist. In the future, new functions will undoubtedly be invented and existing ones improved.

The DOD Protocol Suite is a layered network architecture, which means that network functions are performed by different programs that work independently and in harmony with each other. Not only are there different programs but there are different protocols. The protocols SMTP, FTP and Telnet are described above. Protocols have been defined for getting the current time, the quote of the day, and for translating names. These protocols are called applications protocols because users directly interact with the programs that implement these protocols.

The Transmission Control Protocol, TCP, is used by many of the application protocols. Users almost never interact with TCP directly. TCP establishes a reliable end-to-end connection between two processes on remote computers. Data is sent through a network in small chunks called packets to improve reliability and performance. TCP ensures that packets arrive in order and without errors. If a packet does have errors, TCP requests that the packet be retransmitted.

In turn, TCP calls upon IP, Internet Protocol, to move the data from one network to another. IP is still not the lowest layer of the architecture, since there is usually a "data link layer protocol" below it. This can be any of a number of different protocols, two very common ones being X.25 and Ethernet.

FTP, Telnet and SMTP are called "application protocols", since they are directly used by applications programs that enable users to make use of the network. Network applications are the actual programs that implement these protocols and provide an interface between the user and the computer. An implementation of a network protocol is a program or package of programs that provides the desired network function such as file transfer. Since computers differ from vendor to vendor (e.g. IBM, DEC, CDC), each computer must have its own implementation of these protocols. However, the protocols are standardized so that computers can interoperate over the network (i.e. Can understand and process each other's data). For example, a TCP packet generated by an IBM computer can be read and processed by a DEC computer.

In many instances, network applications programs use the name of the protocol. For example, the program that transfers files may be called "FTP" and the program that allows remote logins may be called "Telnet." Sometimes these protocols are incorporated into larger packages, as is common with SMTP. Many computers have mail programs that allow users on the same computer to send mail to each other. SMTP functions are often added to these mail programs so that users can also send and receive mail through a network. In such cases, there is no separate program called SMTP that the user can access, since the mail program provides the user interface to this network function.

Specific implementation of network protocols, such as FTP, are tailored to the computer hardware and operating system on which they are used. Therefore, the exact user interface varies from one implementation to another. For example, the FTP protocol specifies a set of FTP commands which each FTP implementation must understand and process. However, these are usually placed at a low level, often invisible to the user, who is given a higher set of commands to use.

These higher-level commands are not standardized so they may vary from one implementation of FTP to another. For some operating systems, not all of these commands make equal sense, such as "Change Directory," or may have different meanings. Therefore the specific user interface that the user sees will probably differ.

This file describes a generic implementation of the standard TCP/IP application protocols. Users must consult local documentation for specifics at their sites.

#### Names and Addresses In A Network

~~~~~

In DOD Protocol Suite, each network is given a unique identifying number. This number is assigned by a central authority, namely the Network Information Center run by SRI, abbreviated as SRI-NIC, in order to prevent more than one network from having the same network number. For example, the ARPAnet has network number 10 while MIDnet has a longer number, namely 128.242.

Each host in a network has a unique identification so other hosts can specify

them unambiguously. Host numbers are usually assigned by the organization that manages the network, rather than one central authority. Host numbers do not need to be unique throughout the whole Internet but two hosts on the same network need to have unique host numbers.

The combination of the network number and the host number is called the IP address of the host and is specified as a 32-bit binary number. All IP addresses in the Internet are expressible as 32-bit numbers, although they are often written in dotted decimal notation. Dotted decimal notation breaks the 32-bit number into four eight-bit parts or octets and each octet is specified as a decimal number. For example, 00000001 is the binary octet that specifies the decimal number 1, while 11000000 specifies 192. Dotted decimal notation makes IP addresses much easier to read and remember.

Computers in the Internet are also identified by hostnames, which are strings of characters, such as "phrackvax." However, IP packets must specify the 32-bit IP address instead of the hostname so some way to translating hostnames to IP addresses must exist.

One way is to have a table of hostnames and their corresponding IP addresses, called a hosttable. Nearly every TCP/IP implementation has such a hosttable, although the weaknesses of this method are forcing a shift to a new scheme called the domain name system. In UNIX systems, the hosttable is often called "/etc/hosts." You can usually read this file and find out what the IP addresses of various hosts are. Other systems may call this file by a different name and make it unavailable for public viewing.

Users of computers are generally given accounts to which all charges for computer use are billed. Even if computer time is free at an installation, accounts are used to distinguish between the users and enforce file protections. The generic term "username" will be used in this file to refer to the name by which the computer account is accessed.

In the early days of the ARPAnet which was the first network to use the TCP/IP protocols, computer users were identified by their username, followed by a commercial "at" sign (@), followed by the hostname on which the account existed. Networks were not given names, per se, although the IP address specified a network number.

For example, "knight@phrackvax" referred to user "knight" on host "phrackvax." This did not specify which network "phrackvax" was on, although that information could be obtained by examining the hosttable and the IP address for "phrackvax." (However, "phrackvax" is a fictitious hostname used for this presentation.)

As time went on, every computer on the network had to have an entry in its hosttable for every other computer on the network. When several networks linked together to form the Internet, the problem of maintaining this central hosttable got out of hand. Therefore, the domain name scheme was introduced to split up the hosttable and make it smaller and easier to maintain.

In the new domain name scheme, users are still identified by their usernames, but hosts are now identified by their hostname and any and all domains of which they are a part. For example, the following address, "KNIGHT@UMCVMB.MISSOURI.EDU" specifies username "KNIGHT" on host "UMCVMB". However, host "UMCVMB" is a part of the domain "MISSOURI" which is in turn part of the domain "EDU". There are other domains in "EDU", although only one is named "MISSOURI". In the domain "MISSOURI", there is only one host named "UMCVMB".

However, other domains in "EDU" could theoretically have hosts named "UMCVMB" (although I would say that this is rather unlikely in this example). Thus the combination of hostname and all its domains makes it unique. The method of

translating such names into IP addresses is no longer as straightforward as looking up the hostname in a table. Several protocols and specialized network software called nameservers and resolvers implement the domain name scheme.

Not all TCP/IP implementations support domain names because it is rather new. In those cases, the local hosttable provides the only way to translate hostnames to IP addresses. The system manager of that computer will have to put an entry into the hosttable for every host that users may want to connect to. In some cases, users may consult the nameserver themselves to find out the IP address for a given hostname and then use that IP address directly instead of a hostname.

I have selected a few network hosts to demonstrate how a host system can be specified by both the hostname and host numerical address. Some of the nodes I have selected are also nodes on BITnet, perhaps even some of the others that I do not make a note of due a lack of omniscient awareness about each and every single host system in the world :-)

| Numerical      | Hostname                   | Location                             | BITnet  |
|----------------|----------------------------|--------------------------------------|---------|
| 18.72.0.39     | ATHENA.MIT.EDU             | (Mass. Institute of Technology)      | ?       |
| 26.0.0.73      | SRI-NIC.ARPA               | (DDN Network Information Center)     | -       |
| 36.21.0.13     | MACBETH.STANFORD.EDU       | (Stanford University)                | ?       |
| 36.21.0.60     | PORTIA.STANFORD.EDU        | (Stanford University)                | ?       |
| 128.2.11.131   | ANDREW.CMU.EDU             | (Carnegie Mellon University)         | ANDREW  |
| 128.3.254.13   | LBL.GOV                    | (Lawrence Berkeley Labrotories)      | LBL     |
| 128.6.4.7      | RUTGERS.RUTGERS.EDU        | (Rutgers University)                 | ?       |
| 128.59.99.1    | CUCARD.MED.COLUMBIA.EDU    | (Columbia University)                | ?       |
| 128.102.18.3   | AMES.ARC.NASA.GOV          | (Ames Research Center [NASA])        | -       |
| 128.103.1.1    | HARVARD.EDU                | (Harvard University)                 | HARVARD |
| 128.111.24.40  | HUB.UCSB.EDU               | (Univ. Of Calif-Santa Barbara)       | ?       |
| 128.115.14.1   | LLL-WINKEN.LLNL.GOV        | (Lawrence Livermore Labratories)     | -       |
| 128.143.2.7    | UVAARPA.VIRGINIA.EDU       | (University of Virginia)             | ?       |
| 128.148.128.40 | BROWNM.BROWN.EDU           | (Brown University)                   | BROWN   |
| 128.163.1.5    | UKCC.UKY.EDU               | (University of Kentucky)             | UKCC    |
| 128.183.10.4   | NSSDCA.GSFC.NASA.GOV       | (Goddard Space Flight Center [NASA]) | -       |
| 128.186.4.18   | RAI.CC.FSU.EDU             | (Florida State University)           | FSU     |
| 128.206.1.1    | UMCVMB.MISSOURI.EDU        | (Univ. of Missouri-Columbia)         | UMCVMB  |
| 128.208.1.15   | MAX.ACS.WASHINGTON.EDU     | (University of Washington)           | MAX     |
| 128.228.1.2    | CUNYVM.CUNY.EDU            | (City University of New York)        | CUNYVM  |
| 129.10.1.6     | NUHUB.ACS.NORTHEASTERN.EDU | (Northeastern University)            | NUHUB   |
| 131.151.1.4    | UMRVMA.UMR.EDU             | (University of Missouri-Rolla)       | UMRVMA  |
| 192.9.9.1      | SUN.COM                    | (Sun Microsystems, Inc.)             | -       |
| 192.33.18.30   | VM1.NODAK.EDU              | (North Dakota State Univ.)           | NDSUVM1 |
| 192.33.18.50   | PLAINS.NODAK.EDU           | (North Dakota State Univ.)           | NDSUVAX |

Please Note: Not every system on BITnet has an IP address. Likewise, not every system that has an IP address is on BITnet. Also, while some locations like Stanford University may have nodes on BITnet and have hosts on the IP as well, this does not neccessarily imply that the systems on BITnet and on IP (the EDU domain in this case) are the same systems.

Attempts to gain unauthorized access to systems on the Internet are not tolerated and is legally a federal offense. At some hosts, they take this very seriously, especially the government hosts such as NASA's Goddard Space Flight Center, where they do not mind telling you so at the main prompt when you connect to their system.

However, some nodes are public access to an extent. The DDN Network Information Center can be used by anyone. The server and

database there have proven to be an invaluable source of information when locating people, systems, and other information that is related to the Internet.

-----  
Telnet

~~~~~

Remote login refers to logging in to a remote computer from a terminal connected to a local computer. Telnet is the standard protocol in the DOD Protocol Suite for accomplishing this. The "rlogin" program, provided with Berkeley UNIX systems and some other systems, also enables remote login.

For purposes of discussion, the "local computer" is the computer to which your terminal is directly connected while the "remote computer" is the computer on the network to which you are communicating and to which your terminal is \*NOT\* directly connected.

Since some computers use a different method of attaching terminals to computers, a better definition would be the following: The "local computer" is the computer that you are currently using and the "remote computer" is the computer on the network with which you are or will be communicating. Note that the terms "host" and "computer" are synonymous in the following discussion.

To use Telnet, simply enter the command: TELNET

The prompt that Telnet gives is: Telnet>

(However, you can specify where you want to Telnet to immediately and bypass the the prompts and other delays by issuing the command: TELNET [location].)

There is help available by typing in ?. This prints a list of all the valid subcommands that Telnet provides with a one-line explanation.

Telnet> ?

To connect to to another computer, use the open subcommand to open a connection to that computer. For example, to connect to the host "UMCVMB.MISSOURI.EDU", do "open umcvmb.missouri.edu"

Telnet will resolve (i.e. Translate, the hostname "umcvmb.missouri.edu" into an IP address and will send a packet to that host requesting login. If the remote host decides to let you attempt a login, it prompts you for your username and password. If the host does not respond, Telnet will "time out" (i.e. Wait for a reasonable amount of time such as 20 seconds) and then terminate with a message such as "Host not responding."

If your computer does not have an entry for a remote host in its hosttable and it cannot resolve the name, you can use the IP address explicitly in the telnet command. For example,

TELNET 26.0.0.73 (Note: This is the IP address for the DDN Network Information Center [SRI-NIC.ARPA])

If you are successful in logging in, your terminal is connected to the remote host. For all intents and purposes, your terminal is directly hard-wired to that host and you should be able to do anything on your remote terminal that you can do at any local terminal. There are a few exceptions to this rule, however.

Telnet provides a network escape character, such as CONTROL-T. You can find out what the escape character is by entering the "status" subcommand:

Telnet> status

You can change the escape character by entering the "escape" subcommand:

```
Telnet> escape
```

When you type in the escape character, the Telnet prompt returns to your screen and you can enter subcommands. For example, to break the connection, which usually logs you off the remote host, enter the subcommand "quit":

```
Telnet> quit
```

Your Telnet connection usually breaks when you log off the remote host, so the "quit" subcommand is not usually used to log off.

When you are logged in to a remote computer via Telnet, remember that there is a time delay between your local computer and the remote one. This often becomes apparent to users when scrolling a long file across the terminal screen and they wish to cancel the scrolling by typing CONTROL-C or something similar. After typing the special control character, the scrolling continues. The special control character takes a certain amount of time to reach the remote computer which is still scrolling information. Thus response from the remote computer will not likely be as quick as response from a local computer.

Once you are remotely logged on, the computer you are logged on to effectively becomes your "local computer," even though your original "local computer" still considers you logged on. You can log on to a third computer which would then become your "local computer" and so on. As you log out of each session, your previous session becomes active again.

## File Transfer ~~~~~

FTP is the program that allows files to be sent from one computer to another. "FTP" stands for "File Transfer Protocol".

When you start using FTP, a communications channel with another computer on the network is opened. For example, to start using FTP and initiate a file transfer session with a computer on the network called "UMCVMB", you would issue the following subcommand:

```
FTP UMCVMB.MISSOURI.EDU
```

Host "UMCVMB" will prompt you for an account name and password. If your login is correct, FTP will tell you so, otherwise it will say "login incorrect." Try again or abort the FTP program. (This is usually done by typing a special control character such as CONTROL-C. The "program abort" character varies from system to system.)

Next you will see the FTP prompt, which is:

```
Ftp>
```

There are a number of subcommands of FTP. The subcommand "?" will list these commands and a brief description of each one.

You can initiate a file transfer in either direction with FTP, either from the remote host or to the remote host. The "get" subcommand initiates a file transfer from the remote host (i.e. Tells the remote computer to send the file to the local computer [the one on which you issued the "ftp" command]). Simply enter "get" and FTP will prompt you for the remote host's file name and the (new) local host's file name. Example:

```
Ftp> get
Remote file name?
theirfile
local file name?
myfile
```

ou can abbreviate this by typing both file names on the same line as the "get" subcommand. If you do not specify a local file name, the new local file will be called the same thing as the remote file. Valid FTP subcommands to get a file include the following:

```
get theirfile myfile
get doc.x25
```

The "put" subcommand works in a similar fashion and is used to send a file from the local computer to the remote computer. Enter the command "put" and FTP will prompt you for the local file name and then the remote file name. If the transfer cannot be done because the file doesn't exist or for some other reason, FTP will print an error message.

There are a number of other subcommands in FTP that allow you to do many more things. Not all of these are standard so consult your local documentation or type a question mark at the FTP prompt. Some functions often built into FTP include the ability to look at files before getting or putting them, the ability to change directories, the ability to delete files on the remote computer, and the ability to list the directory on the remote host.

An intriguing capability of many FTP implementations is "third party transfers." For example, if you are logged on computer A and you want to cause computer B to send a file to computer C, you can use FTP to connect to computer B and use the "rmtsend" command. Of course, you have to know usernames and passwords on all three computers, since FTP never allows you to peek into someone's directory and files unless you know their username and password.

The "cd" subcommand changes your working directory on the remote host. The "lcd" subcommand changes the directory on the local host. For UNIX systems, the meaning of these subcommands is obvious. Other systems, especially those that do not have directory-structured file system, may not implement these commands or may implement them in a different manner.

The "dir" and "ls" subcommands do the same thing, namely list the files in the working directory of of the remote host.

The "list" subcommand shows the contents of a file without actually putting it into a file on the local computer. This would be helpful if you just wanted to inspect a file. You could interrupt it before it reached the end of the file by typing CONTROL-C or some other special character. This is dependent on your FTP implementation.

The "delete" command can delete files on the remote host. You can also make and remove directories on the remote host with "mkdir" and "rmdir". The "status" subcommand will tell you if you are connected and with whom and what the state of all your options are.

If you are transferring binary files or files with any non-printable characters, turn binary mode on by entering the "binary" subcommand:

```
binary
```

To resume non-binary transfers, enter the "ascii" subcommand.

Transferring a number of files can be done easily by using "mput" (multiple put) and "mget" (multiple get). For example, to get every file in a particular



directory, first issue a "cd" command to change to that directory and then an "mget" command with an asterisk to indicate every file:

```
cd somedirectory
mget *
```

When you are done, use the "close" subcommand to break the communications link. You will still be in FTP, so you must use the "bye" subcommand to exit FTP and return to the command level. The "quit" subcommand will close the connection and exit from FTP at the same time.

## Mail

~~~~

Mail is the simplest network facility to use in many ways. All you have to do is to create your message, which can be done with a file editor or on the spur of the moment, and then send it. Unlike FTP and Telnet, you do not need to know the password of the username on the remote computer. This is so because you cannot change or access the files of the remote user nor can you use their account to run programs. All you can do is to send a message.

There is probably a program on your local computer which does mail between users on that computer. Such a program is called a mailer. This may or may not be the way to send or receive mail from other computers on the network, although integrated mailers are more and more common. UNIX mailers will be used as an example in this discussion.

Note that the protocol which is used to send and receive mail over a TCP/IP network is called SMTP, the "Simple Mail Transfer Protocol." Typically, you will not use any program called SMTP, but rather your local mail program.

UNIX mailers are usually used by invoking a program named "mail". To receive new mail, simply type "mail".

There are several varieties of UNIX mailers in existence. Consult your local documentation for details. For example, the command "man mail" prints out the manual pages for the mail program on your computer.

To send mail, you usually specify the address of the recipient on the mail command. For example: "mail knight@umcvmb.missouri.edu" will send the following message to username "knight" on host "umcvmb".

You can usually type in your message one line at a time, pressing RETURN after each line and typing CONTROL-D to end the message. Other facilities to include already-existing files sometimes exist. For example, Berkeley UNIXes allow you to enter commands similar to the following to include a file in your current mail message:

```
r myfile
```

In this example, the contents of "myfile" are inserted into the message at this point.

Most UNIX systems allow you to send a file through the mail by using input redirection. For example:

```
mail knight@umcvmb.missouri.edu < myfile
```

In this example, the contents of "myfile" are sent as a message to "knight" on "umcvmb."

Note that in many UNIX systems the only distinction between mail bound for another user on the same computer and another user on a remote computer is

simply the address specified. That is, there is no hostname for local recipients. Otherwise, mail functions in exactly the same way. This is common for integrated mail packages. The system knows whether to send the mail locally or through the network based on the address and the user is shielded from any other details.

"The Quest For Knowledge Is Without End..."

==Phrack Inc.==

Volume Three, Issue 27, File 4 of 12

```
.....
::
:: NUA-List For Datex-P And X.25 Networks ::
::
:: by Oberdaemon ::
::
:: April 9, 1989 ::
::
::.....
```

Key:

- A = successfully connected
- B = sources say that it works
- C = officially closed
- D = disconnected/no circuit or permanently busy
- I = illegal address or invalid call
- O = out of order
- r = R-NUA
- T = time-out
- X = sources say that it should work but it doesn't (or is permanently busy)
- Y = barred (=?)
- Z = sources say that it should not work
- = including the following digits gives you another number
- n/a = not yet tested
- ? = error on a subsequent communication system

Remark: I have also included some obviously misstyped NUAs which have been found in widely circulating lists. There are also numbers which do not form a valid NUA but a common prefix (e.g. 0202 2 Helpak).

Format: Each NUA in this list consists of the following fields:

cccc naa aaa aaa... oooo... ddd....

- cccc is the country prefix (e.g. 0262 Germany). This prefix can be omitted when calling and called party have both the same prefix.
- naa are the first three digits of the address. n often specifies a certain network in that country.
- aaa aaa... are the other digits of the address.
- ooo... are some extra digits/letters which should be added after the NUA. The correct syntax depends on your PAD. This list uses any syntax - usually depending on the notation the author of the source used. The oooo... field is usually empty.
- ddd... is a short description of the service.

If you find two NUAs who differ only in the number of trailing zeroes, but connect to the same service, you may safely throw away the longer one.

!! Please note that most PADs don't accept spaces inside a NUA !!

|                               |          |                                                                  |
|-------------------------------|----------|------------------------------------------------------------------|
| 0200                          | GR       | Greece                                                           |
| 0202                          |          |                                                                  |
| 0202 2                        |          | Helpak (enkelriktad trafik)                                      |
| X 0202 452 241 24104          |          |                                                                  |
| 0204                          | NL       | Netherlands                                                      |
| 0204 0                        |          | Datanet (1?)                                                     |
| 0204 1                        |          | Datanet (1?)                                                     |
| A 0204 129 001 3              |          | ? (Netz ?)                                                       |
| A 0204 129 001 4              |          | X.25                                                             |
| A 0204 129 003 1              |          | NONOBY                                                           |
| A 0204 129 003 4              |          | Searchline                                                       |
| D 0204 129 004 33             | SARA     | National Institute for High Energy Physics (NIKHEF) SARA network |
| D 0204 129 004 34             | NIKHEF   | National Institute for High Energy Physics (NIKHEF) SARA network |
| D 0204 129 005 6              | MCVAX    | MCVAX, HOLLAND                                                   |
| A 0204 129 005 675            | HARING   | MCVAX Line 2                                                     |
| 0204 129 400 2                |          | DUPHAR WEESP, HOLLAND                                            |
| A 0204 134 014 80500          |          | Utrecht ?                                                        |
| 0204 303 0                    |          | EPOIS EPO Den Haag                                               |
| 0204 304 0                    |          | DSAMISOOM SAMSON                                                 |
| 0204 4                        |          | Dabas                                                            |
| 0206                          | B        | Belgium                                                          |
| 0206 2                        |          | DCS                                                              |
| A 0206 210 300 003            |          | Eigebib                                                          |
| A 0206 222 100 6              | BBDA     | Brussels DEC A                                                   |
| A 0206 222 101 2              | ?        | Ministry of economic affairs                                     |
| A 0206 222 102 6              |          | celex                                                            |
| A 0206 224 001 903            | PRLB2    | Belgium Unix Backbone                                            |
| 0206 3                        |          | Euronet                                                          |
| A 0206 228 821 0              |          | DGxiiiF                                                          |
| 0208                          | F        | France                                                           |
| 0208 0                        | TRANSPAC | French Transpac                                                  |
| A 0208 006 040 010            |          | Telesystemes 1                                                   |
| A 0208 006 040 201            |          | Telesystemes 2                                                   |
| A 0208 026 020 843            |          | ?                                                                |
| A 0208 034 020 036            | CNUSC    | CNUSC (France)                                                   |
| A 0208 034 020 258            | CNUSC    | CNUSC Montpellier                                                |
| A 0208 038 020 100            |          | CICG Grenoble                                                    |
| A 0208 038 020 676            |          | ILL VEGA VAX 8700 VMS 4.7                                        |
| I 0208 044 001 645            |          | ?                                                                |
| A 0208 057 040 540            |          | QSD (Chat system)                                                |
| I 0208 069 021 258            |          |                                                                  |
| A 0208 075 000 087            | IRCAM    | IRCAM-ERIK VAX 11/780 4.2 BSD                                    |
| I 0208 075 000 355            |          | ?                                                                |
| I 0208 075 001 281*D          | CCPN     | Computing Centre Nuclear Physics                                 |
| I 0208 075 002 314            |          | GRF                                                              |
| A 0208 075 020 655            | LITP     | LITP Unix 4.3 BSD (France)                                       |
| A 0208 075 041 280            |          | Pasteur MV8000                                                   |
| A 0208 078 020 118            | INRIA    | INRIA, Rocquencourt (France) Multics                             |
| B 0208 078 020 16901          | INRIA    | Institute National de Recherche en Informatique                  |
| 0208 078 081 67304            | INRIAUI  | INRIA - UUCICO                                                   |
| I 0208 091 000 270*DCISICISI3 |          | IBM - TSO                                                        |
| I 0208 091 000 309*DCISICISI1 |          | IBM - TSO                                                        |

|   |      |     |      |          |            |                                                    |
|---|------|-----|------|----------|------------|----------------------------------------------------|
| I | 0208 | 091 | 000  | 519*     | DCISICISI2 | IBM - TSO                                          |
| I | 0208 | 091 | 010  | 320      | CJRCE      |                                                    |
| I | 0208 | 091 | 040  | 047      | SACLAY     | Saclay - France                                    |
| I | 0208 | 091 | 040  | 532      |            | Pascal                                             |
| A | 0208 | 091 | 190  | 258      |            | LURE, VAX 11/780 VMS 4.6, Synchrotron source (SES) |
|   | 0208 | 1   |      |          |            | NTI                                                |
| A | 0208 | 101 |      |          | TEXTFRA    | Text Generator, FRANCE                             |
|   | 0214 |     |      |          | E          | Spain                                              |
|   | 0214 | 1   |      |          | SPAIN      | Spanish data network (NID/CTNE)                    |
|   | 0214 | 5   |      |          |            | Iberpac                                            |
| O | 0214 | 521 | 202  | 5022     |            |                                                    |
| A | 0214 | 521 | 302  | 1020     |            | ETSITM (EANNET) VAX 11/750 VMS 4.5                 |
|   | 0222 |     |      |          | I          | Italy                                              |
|   | 0222 | 2   |      |          |            | Itapac                                             |
| A | 0222 | 262 | 002  | 1        | ESAIRS1    | ESA-QUEST, IRS 1                                   |
| I | 0222 | 262 | 002  | 2        | ESAIRS2    | ESA-IRS 2                                          |
| O | 0222 | 262 | 003  | 2        |            | IASI VAX                                           |
| A | 0222 | 262 | 004  | 3        |            | VAXLNF (INFNET) VAX 8650                           |
| O | 0222 | 263 | 200  | 4        |            | NUA-Information ?                                  |
| A | 0222 | 265 | 014  | 0        |            | Techni-Link                                        |
| I | 0222 | 306 | 3    |          |            | Progetto-Sirio                                     |
| I | 0222 | 306 | 700  |          |            | European Space Agency                              |
| I | 0222 | 306 | 9*D  |          | CNUCE      | CNUCE                                              |
| I | 0222 | 307 | 0    |          |            | CILEA                                              |
| I | 0222 | 307 | 1    |          |            | CED Datenbanksysteme Rom                           |
| I | 0222 | 307 | 2*D  |          | RTC20      | JRC                                                |
| I | 0222 | 307 | 7*D  | QUESTD5  | ESA        | ESA                                                |
| D | 0222 | 307 | 8*D  | QUESTD5  | ESA2       | ESA                                                |
|   | 0228 |     |      |          | CH         | Switzerland                                        |
| D | 0228 | 310 | 1*DN |          | DATASTAR   | Data-Star, Switzerland                             |
|   | 0228 | 4   |      |          |            | Telepac                                            |
| A | 0228 | 462 | 110  | 0101     |            | Cigy IBMA                                          |
| A | 0228 | 462 | 110  | 0102     |            | Cigy DEC1091                                       |
| A | 0228 | 462 | 110  | 09       |            | EDP Basel                                          |
| A | 0228 | 462 | 110  | 23       |            | ?                                                  |
| A | 0228 | 462 | 110  | 34       |            | ?                                                  |
| A | 0228 | 462 | 110  | 36       |            | ?                                                  |
| A | 0228 | 462 | 110  | 52       |            | DANZA'S 11/785 VMS 4.4                             |
| A | 0228 | 462 | 110  | 61       |            | PKK node RBPK00                                    |
| A | 0228 | 462 | 110  | 66       |            | PROGNOS Basel (CIERR 1402)                         |
| A | 0228 | 462 | 110  | 70       |            | ?                                                  |
| A | 0228 | 462 | 110  | 84       |            | (CIERR 1402)                                       |
| Y | 0228 | 462 | 170  | 02       |            | INFOTEX PTT                                        |
| I | 0228 | 464 | 109  | 06       |            | GD PTT Schweiz (ring with CTRL G)                  |
| A | 0228 | 464 | 110  | 10       | DM         | DATAMAIL (RSAG)                                    |
| A | 0228 | 464 | 110  | 110      | DSTAR2     | Datatar (2nd. Line)                                |
| A | 0228 | 464 | 110  | 112      |            | RSAG                                               |
| Z | 0228 | 464 | 110  | 113      |            | RSAG                                               |
| A | 0228 | 464 | 110  | 115      | DATASTAR   | Data-Star, Switzerland (Pharmadatenbank ?)         |
| A | 0228 | 468 | 113  | 150      |            | Management Joint Trust                             |
| D | 0228 | 468 | 114  | 05       | CERN       | CERN (=CERNXX?)                                    |
| A | 0228 | 468 | 114  | 0505     |            | CS Group LAVC on node UXCOMS                       |
| A | 0228 | 468 | 114  | 0510     | CER        | CERN, Geneva                                       |
| A | 0228 | 468 | 114  | 0510     | CERNVAX    | CERN X25 Multigate                                 |
| B | 0228 | 468 | 114  | 0510*DLO | CERNLO     | CERN 300 bps OUTDIAL (where ???)                   |
| B | 0228 | 468 | 114  | 0510*DME | CERNME     | CERN 1200 bps OUTDIAL (where ???)                  |
| B | 0228 | 468 | 114  | 0510*DHI |            | CERN ?                                             |
| A | 0228 | 468 | 114  | 0514     |            | 4.2 BSD UNIX (Mint)                                |
| A | 0228 | 468 | 114  | 0515     |            | Cern LS Group LAVC VXGIFT                          |
| A | 0228 | 468 | 114  | 0520     |            | Cern                                               |
| A | 0228 | 468 | 114  | 0532     |            | Cern                                               |
| A | 0228 | 468 | 114  | 0533     |            | L3 test beam VAX-750 VXC3                          |

|    |      |     |     |         |                                                                  |
|----|------|-----|-----|---------|------------------------------------------------------------------|
| A  | 0228 | 468 | 114 | 0534    | UXINFN                                                           |
| A  | 0228 | 468 | 114 | 0538    | CS Group LAVC on node UXCOMS                                     |
| A  | 0228 | 468 | 114 | 054     | Cern                                                             |
| A  | 0228 | 468 | 114 | 0545    | Cern                                                             |
| A  | 0228 | 468 | 114 | 0551    | VXCERN VMS 4.6                                                   |
| A  | 0228 | 468 | 114 | 0553    | VXCERN VMS 4.6                                                   |
| A  | 0228 | 468 | 114 | 0556    | VXCERN VMS 4.6                                                   |
| A  | 0228 | 468 | 114 | 0560    | CERN VXNA31                                                      |
| A  | 0228 | 468 | 114 | 0561    | CERN VXNA31                                                      |
| A  | 0228 | 468 | 114 | 0562    | L3 VAX 11/750 VXC3MU                                             |
| A  | 0228 | 468 | 114 | 0572    | ISOLDES VAX 11/750                                               |
| A  | 0228 | 468 | 114 | 0574    | ? (Operator)                                                     |
| A  | 0228 | 468 | 114 | 0581    | ?                                                                |
| A  | 0228 | 468 | 114 | 0583    | %Merit:X.25 (Merit Computer Network, see appendix)               |
| A  | 0228 | 468 | 114 | 0584    | Develcon                                                         |
| A  | 0228 | 468 | 114 | 0587    | ? (Operator)                                                     |
| A  | 0228 | 468 | 114 | 0588    | ? (Operator)                                                     |
| A  | 0228 | 468 | 114 | 0589    | ? (Operator)                                                     |
| A  | 0228 | 468 | 114 | 0592    | Princeton University High Energy Physics Group Vax 11/750        |
| A  | 0228 | 468 | 114 | 0593    | University of Michigan Physics Vax 11/750                        |
| A  | 0228 | 468 | 114 | 0596    | N.U. Physics Vax 11/750                                          |
| A  | 0228 | 468 | 114 | 0597    | Harvard University High Energy Physics Lab. Vax 8650             |
| A  | 0228 | 468 | 114 | 0598    | MIT-LNS*PIERRE                                                   |
| A  | 0228 | 468 | 114 | 0599    | DoD, Distributed Databases Coordination Center (JMILLER,X0TF3AP) |
| D  | 0228 | 468 | 114 | 18      | BIOGEN (=GODEL?)                                                 |
| A  | 0228 | 468 | 114 | 23      | EDCHUB::                                                         |
| A  | 0228 | 469 | 110 | 02      | EPFL (something)                                                 |
| A  | 0228 | 469 | 110 | 0202    | EPFL HELP                                                        |
| D  | 0228 | 469 | 110 | 0203    | EPFL DE.VAX                                                      |
| D  | 0228 | 469 | 110 | 0204    | EPFL GC.VAX                                                      |
| A  | 0228 | 469 | 110 | 0205    | EPFL DP.VAX                                                      |
| A  | 0228 | 469 | 110 | 0206    | EPFL ME.VAX                                                      |
| A  | 0228 | 469 | 110 | 0207    | EPFL GR.VAX                                                      |
| A  | 0228 | 469 | 110 | 0208    | EPFL MA.VAX                                                      |
| A  | 0228 | 469 | 110 | 0209    | EPFL DI.VAX                                                      |
| D  | 0228 | 469 | 110 | 0210    | EPFL IMAC.PDP                                                    |
| D  | 0228 | 469 | 110 | 0211    | EPFL CGL.VAX                                                     |
| D  | 0228 | 469 | 110 | 0212    | EPFL DE.MVAX                                                     |
| A  | 0228 | 469 | 110 | 0213    | EPFL CC.VAX                                                      |
| A  | 0228 | 469 | 110 | 03      | EPFL Cyber 855                                                   |
| Ar | 0228 | 469 | 110 | 0301    | EPFL Cyber                                                       |
| A  | 0228 | 475 | 110 | 02      | HSG St.Gallen                                                    |
| Ar | 0228 | 479 | 104 | 00      | Cern                                                             |
| A  | 0228 | 479 | 110 | 23      | I.P.Sharp (CA)                                                   |
| X  | 0228 | 479 | 110 | 86      | KOMETH (ETH ZH)                                                  |
| A  | 0228 | 479 | 110 | 650     | KOMETH (ETH ZH)                                                  |
| I  | 0228 | 479 | 111 |         |                                                                  |
| A  | 0228 | 479 | 111 | 06      | GRS                                                              |
| I  | 0228 | 479 | 111 | 086     |                                                                  |
| I  | 0228 | 479 | 111 | 11      |                                                                  |
| I  | 0228 | 479 | 111 | 18      | ZEV-Mailbox Zuerich                                              |
| A  | 0228 | 479 | 111 | 750     | ComNet (R-Nua)                                                   |
| A  | 0228 | 479 | 311 | 49      | KOMETH Output (ETH ZH)                                           |
| A  | 0228 | 499 | 111 | 02001   | KOMETH (Entry Uni)                                               |
|    | 0228 | 9   |     |         | Radio-Suisse                                                     |
|    | 0232 |     |     |         | Austria                                                          |
|    | 0232 | 2   |     |         | Datex-P                                                          |
| O  | 0232 | 242 | 210 | 91      |                                                                  |
| ?  | 0232 | 242 | 211 | 42*DMAI | Sysnet Wien (Gast,Gast)                                          |

|    |      |     |     |        |          |                                 |
|----|------|-----|-----|--------|----------|---------------------------------|
| A  | 0232 | 252 | 310 | 000    |          | Uni Wien                        |
|    | 0232 | 9   |     |        |          | Radio Austri                    |
| A  | 0232 | 911 | 602 | 323    |          | Inpadoc                         |
|    | 0234 |     |     |        | GB       | United Kingdom                  |
|    | 0234 | 1   |     |        | IPSS     | IPSS UK network                 |
| A  | 0234 | 110 | 020 | 02018  |          | BT DIALCOM GROUP (PRESTEL ?)    |
|    | 0234 | 2   |     |        |          | PSS                             |
|    | 0234 | 198 | 061 | 60     |          | Queen Marry C.                  |
| B  | 0234 | 207 | 920 | 002    |          | SWVA                            |
|    | 0234 | 211 | 920 | 100515 |          | Hostess Doc.                    |
|    | 0234 | 212 |     |        |          | Dialnet                         |
| O  | 0234 | 212 | 080 | 105    |          |                                 |
| I  | 0234 | 212 | 080 | 110    | EPSONUK  | Epson (UK)                      |
| A  | 0234 | 212 | 300 | 120    | DIALNET  | IGS Leased line to DIALOG in US |
| A  | 0234 | 212 | 300 | 12011  | DIALNET  | LRS-DIALOG 2 Dialog via London  |
| Ar | 0234 | 212 | 300 | 12013  | DIALMRC  | LRS-Dialmail (Reverse Charging) |
| A  | 0234 | 212 | 300 | 120*D@ | DIALNET  | IGS Leased line to DIALOG in US |
| A  | 0234 | 212 | 300 | 2920   |          | GeoNet GEO2                     |
| B  | 0234 | 212 | 301 | 161    |          | OPTEL                           |
|    | 0234 | 212 | 301 | 186    |          | GEOSYSTEMS                      |
|    | 0234 | 212 | 301 | 187    |          | CAP GROUP LTD.                  |
|    | 0234 | 212 | 301 | 18722  | CAP      | CAP Industry Ltd.               |
|    | 0234 | 212 | 301 | 281    |          | ONE TO ONE COMMS                |
| O  | 0234 | 212 | 302 | 02192  | PSSCLK   | PSS Clock                       |
| B  | 0234 | 212 | 399 | 12013  | DIALMAL  | Dialmail via London             |
| A  | 0234 | 212 | 900 | 115    | STL      | STL : ACER (BSD UNIX 4.2)       |
|    | 0234 | 213 | 000 | 11     |          |                                 |
|    | 0234 | 213 | 000 | 151    | COMPUTAS | Computas Ltd                    |
|    | 0234 | 213 | 000 | 1511   |          | COMPUTAS LTD.                   |
| D  | 0234 | 213 | 900 | 10150  | ALVEY    | Alvey Mail and FTP.             |
|    | 0234 | 214 | 200 | 162    | GLAXO    | Galaxo Industries               |
|    | 0234 | 214 | 400 | 12     |          | CONTROL DATA LTD.               |
|    | 0234 | 215 | 000 | 11600  | C3       |                                 |
|    | 0234 | 215 | 710 | 104    |          | Consultans Ltd                  |
|    | 0234 | 216 | 700 | 127    | PFIZER   | Pfizer, SANDWICH                |
|    | 0234 | 216 | 700 | 12701  | PFIZER1  | Pfizer, SANDWICH                |
|    | 0234 | 216 | 700 | 12702  | PFIZER2  | Pfizer, SANDWICH                |
|    | 0234 | 216 | 700 | 12703  | PFIZER3  | Pfizer, SANDWICH                |
|    | 0234 | 216 | 700 | 12704  | PFIZER4  | Pfizer, SANDWICH                |
|    | 0234 | 216 | 700 | 12706  | PFIZER6  | Pfizer, SANDWICH                |
|    | 0234 | 218 | 801 | 00300  |          | British Telecom Hotline         |
|    | 0234 | 2   |     |        |          | PSS                             |
|    | 0234 | 198 | 061 | 60     |          | Queen Marry C.                  |
| B  | 0234 | 207 | 920 | 002    |          | SWVA                            |
|    | 0234 | 211 | 920 | 100515 |          | Hostess Doc.                    |
|    | 0234 | 212 |     |        |          | Dialnet                         |
| O  | 0234 | 212 | 080 | 105    |          |                                 |
| I  | 0234 | 212 | 080 | 110    | EPSONUK  | Epson (UK)                      |
| A  | 0234 | 212 | 300 | 120    | DIALNET  | IGS Leased line to DIALOG in US |
| A  | 0234 | 212 | 300 | 12011  | DIALNET  | LRS-DIALOG 2 Dialog via London  |
| Ar | 0234 | 212 | 300 | 12013  | DIALMRC  | LRS-Dialmail (Reverse Charging) |
| A  | 0234 | 212 | 300 | 120*D@ | DIALNET  | IGS Leased line to DIALOG in US |
| A  | 0234 | 212 | 300 | 2920   |          | GeoNet GEO2                     |
| B  | 0234 | 212 | 301 | 161    |          | OPTEL                           |
|    | 0234 | 212 | 301 | 186    |          | GEOSYSTEMS                      |
|    | 0234 | 212 | 301 | 187    |          | CAP GROUP LTD.                  |
|    | 0234 | 212 | 301 | 18722  | CAP      | CAP Industry Ltd.               |
|    | 0234 | 212 | 301 | 281    |          | ONE TO ONE COMMS                |
| O  | 0234 | 212 | 302 | 02192  | PSSCLK   | PSS Clock                       |
| B  | 0234 | 212 | 399 | 12013  | DIALMAL  | Dialmail via London             |
| A  | 0234 | 212 | 900 | 115    | STL      | STL : ACER (BSD UNIX 4.2)       |
|    | 0234 | 213 | 000 | 11     |          |                                 |
|    | 0234 | 213 | 000 | 151    | COMPUTAS | Computas Ltd                    |

|   |      |     |     |         |          |                                                          |
|---|------|-----|-----|---------|----------|----------------------------------------------------------|
|   | 0234 | 213 | 000 | 1511    |          | COMPUTAS LTD.                                            |
| D | 0234 | 213 | 900 | 10150   | ALVEY    | Alvey Mail and FTP.                                      |
|   | 0234 | 214 | 200 | 162     | GLAXO    | Galaxo Industries                                        |
|   | 0234 | 214 | 400 | 12      |          | CONTROL DATA LTD.                                        |
|   | 0234 | 215 | 000 | 11600   | C3       |                                                          |
|   | 0234 | 215 | 710 | 104     |          | Consultans Ltd                                           |
|   | 0234 | 216 | 700 | 127     | PFIZER   | Pfizer, SANDWICH                                         |
|   | 0234 | 216 | 700 | 12701   | PFIZER1  | Pfizer, SANDWICH                                         |
|   | 0234 | 216 | 700 | 12702   | PFIZER2  | Pfizer, SANDWICH                                         |
|   | 0234 | 216 | 700 | 12703   | PFIZER3  | Pfizer, SANDWICH                                         |
|   | 0234 | 216 | 700 | 12704   | PFIZER4  | Pfizer, SANDWICH                                         |
|   | 0234 | 216 | 700 | 12706   | PFIZER6  | Pfizer, SANDWICH                                         |
|   | 0234 | 218 | 801 | 00300   |          | British Telecom Hotline                                  |
|   | 0234 | 219 |     |         |          | PSS-Network                                              |
|   | 0234 | 219 | 200 | 001     |          | Network Monitoring Centre (NFS)                          |
|   | 0234 | 219 | 200 | 002     |          | Network Monitoring Centre (NFS)                          |
|   | 0234 | 219 | 200 | 100     |          | University of London Computing Centre                    |
|   | 0234 | 219 | 200 | 10069   | JANETGW  | PSS/JANET Gateway (ULCC)                                 |
| B | 0234 | 219 | 200 | 101     |          | Finsbury Data Service                                    |
|   | 0234 | 219 | 200 | 1082    |          | BING COMPUTER SERVICES (EUROPE) LTD.                     |
| A | 0234 | 219 | 200 | 118     | ADPUK    | ADP NETWORK SERVICES LTD. (=AUTONET?)                    |
|   | 0234 | 219 | 200 | 118     |          | atomic energy research establishment                     |
|   | 0234 | 219 | 200 | 13370   | QTLON    | Quantime                                                 |
| A | 0234 | 219 | 200 | 146     | CEGB     | CEGB, Park Street, London                                |
| B | 0234 | 219 | 200 | 14869   | ULCC     | Univ. London Computer Centre (=JANET2?)                  |
| B | 0234 | 219 | 200 | 14918   | UCLMVAX  | UCL Microvax ARPA Gateway                                |
| B | 0234 | 219 | 200 | 14970   |          |                                                          |
|   | 0234 | 219 | 200 | 154     |          | UNILEVER COMPUTER SERVICES LTD.                          |
| A | 0234 | 219 | 200 | 171     | LEXIS    | LEXIS                                                    |
| A | 0234 | 219 | 200 | 190     | INFOLINE | PERGAMON INFOLINE LTD. (NFS)                             |
| A | 0234 | 219 | 200 | 203     | IPSH     | SHARP, I. P. ASSOCIATES LTD.                             |
| A | 0234 | 219 | 200 | 220     |          | BRITISH LIBRARY ON-LINE SYSTEM                           |
| A | 0234 | 219 | 200 | 222     | BLAISE   | British Library Information System                       |
|   | 0234 | 219 | 200 | 297     |          | RLFE & NOLAN COMPUTER SERVICES PLC                       |
| B | 0234 | 219 | 200 | 300     | UCL      | University College London - Computer                     |
|   | 0234 | 219 | 200 | 300     | UCLFTP   | UCL (FTP)                                                |
| A | 0234 | 219 | 200 | 300     | UCLMAIL  | UCL (JNT Mail)                                           |
|   | 0234 | 219 | 200 | 304     |          | University Computing Company (GB) Ltd.                   |
| B | 0234 | 219 | 200 | 333     | EUCLID   | University College London Computer Centre                |
|   | 0234 | 219 | 200 | 394     | CISI     | CISI (=SIANET?;=Computer Services, London?)              |
|   | 0234 | 219 | 200 | 871     |          | Instrument Rentals (UK) Ltd.                             |
| B | 0234 | 219 | 201 | 002     | POOLE    |                                                          |
|   | 0234 | 219 | 201 | 004     | BGOLD81  | Telecom BT-GOLD System 81                                |
|   | 0234 | 219 | 201 | 00472   | BGOLD72  | Telecom BT-GOLD System 72                                |
|   | 0234 | 219 | 201 | 00474   | BGOLD74  | Telecom BT-GOLD System 74                                |
|   | 0234 | 219 | 201 | 00479   | BTGOLD   | Telecom BT-GOLD System 79                                |
|   | 0234 | 219 | 201 | 00481   | BTGOLDA  | Telecom BT-GOLD System 81                                |
|   | 0234 | 219 | 201 | 00482   | BTGOLD82 | Telecom BT-GOLD System 82                                |
|   | 0234 | 219 | 201 | 00484   | BGOLD84  | Telecom Gold System 84                                   |
|   | 0234 | 219 | 201 | 005     | PSSMAIL  | PSS TELE-MAIL service                                    |
| B | 0234 | 219 | 201 | 00513   | DIANENQ  | Euronet DIANE Enquiry Service<br>(=Echo,Rutherford?)     |
| B | 0234 | 219 | 201 | 00513   | EUROINFO | Euronet Diane Information Service<br>(=Echo,Rutherford?) |
| A | 0234 | 219 | 201 | 00515   | BTDOC    | BT Online Documentation Service                          |
| A | 0234 | 219 | 201 | 00515   | HOSTESS  | Hostess system (BT)                                      |
|   | 0234 | 219 | 201 | 00530   | BAYNARD  | BT Protocol Study Centre (NFS)                           |
|   | 0234 | 219 | 201 | 00615   | PSSDOC   | PSS documentation service/X25 technical<br>info on line  |
|   | 0234 | 219 | 201 | 00620   | BTBILL   | BT Online Billing                                        |
|   | 0234 | 219 | 201 | 0100513 |          |                                                          |
|   | 0234 | 219 | 201 | 01013   | HOSTESS  | Hostess system (BT) (=PSS Switchstream 1 ?)              |
| T | 0234 | 219 | 201 | 01030   | TSTB     | British Telecom                                          |

|   |      |     |     |                 |         |                                                          |
|---|------|-----|-----|-----------------|---------|----------------------------------------------------------|
|   | 0234 | 219 | 201 | 025             | PRESTEL | BT Prestel Service                                       |
|   | 0234 | 219 | 201 | 02517           |         |                                                          |
|   | 0234 | 219 | 201 | 07800           |         |                                                          |
|   | 0234 | 219 | 201 | 15600           | ESA1    | ESA-IRS via London                                       |
|   | 0234 | 219 | 201 | 18              | ADPUK   | ADP Network Services Ltd                                 |
|   | 0234 | 219 | 210 | 050             |         | BT Mailbox facility (NFS)                                |
|   | 0234 | 219 | 511 | 31              | GEC     | GEC Computers Borehamwood                                |
|   | 0234 | 219 | 511 | 311             | GECB    | GEC Computers Ltd. Borehamwood                           |
|   | 0234 | 219 | 513 | 11              | GECB    | GEC Computers Ltd. Borehamwood                           |
|   | 0234 | 219 | 709 | 111             |         | Modular Computer Services Ltd. (MODCOMP)                 |
| ? | 0234 | 219 | 709 | 111             | NPL1    | National Physical Laboratory                             |
|   | 0234 | 219 | 709 | 210             | NPL2    | National Physical Laboratory, Protocol Std Group         |
| B | 0234 | 219 | 806 | 160             | QMC     | Queen Mary College London                                |
| X | 0234 | 220 | 200 | 1070            |         | island-Adventure-Game                                    |
| X | 0234 | 220 | 200 | 10700           |         | island-Adventure-Game                                    |
|   | 0234 | 220 | 641 | 141             | ESSX    | Essex, University of, Computing Service (2653,2653,Mist) |
| A | 0234 | 220 | 641 | 1411            |         | MUD (Adventure Game), <guest>, <mist> or <2653,2653>     |
| B | 0234 | 221 | 222 | 122             | MIDB    | MIDNET Gateway at Birmingham (=MIDBHM)                   |
|   | 0234 | 221 | 222 | 223             | BIRP    | Prime R & D at Birmingham                                |
|   | 0234 | 221 | 222 | 225             |         | Freight Comp. Services                                   |
|   | 0234 | 222 | 236 | 163             | CARDF   | Cardiff, University College                              |
|   | 0234 | 222 | 236 | 16300           | CARDIFF | Univ. Coll. Cardiff Multics                              |
|   | 0234 | 222 | 236 | 236             | UWIST   | University of Wales                                      |
|   | 0234 | 222 | 300 | 16102           | ACORN   | Acorn Computers                                          |
|   | 0234 | 222 | 339 | 399             | CAMBRID | Cambridge University (Phoenix)                           |
|   | 0234 | 222 | 530 | 303             | SWURCC  | South-West Universities                                  |
|   | 0234 | 222 | 530 | 30388           | SWURCC  | South-West Universities Network                          |
|   | 0234 | 222 | 530 | 30398           | SWCFTP  | SWURCC (FTP)                                             |
| A | 0234 | 222 | 715 | 151             | KENT    | University of Kent                                       |
| X | 0234 | 222 | 715 | 11              |         | ? (---,Guest,Friend (call PIP))                          |
|   | 0234 | 223 | 440 |                 | TI      | Texas Instruments Ltd                                    |
|   | 0234 | 223 | 440 | 144             | BED5    | Prime R & D at Bedford (NFS)                             |
|   | 0234 | 223 | 440 | 345             | TI      | Texas Instruments Ltd                                    |
|   | 0234 | 223 | 500 | 10998           | HLH     | High Level Hardware Ltd.                                 |
| B | 0234 | 223 | 519 | 111             | AERE    | Atomic Energy Research Establishment at Harwell          |
| T | 0234 | 223 | 519 | 11198           | ADA     | ADA UK Database                                          |
|   | 0234 | 223 | 519 | 119169          |         | JANET                                                    |
|   | 0234 | 223 | 519 | 191             | DLVAFTP | Daresbury SRS VAX (FTP)                                  |
| A | 0234 | 223 | 519 | 191             | JANET   | Gateway to JANET at Rutherford                           |
|   | 0234 | 223 | 519 | 191             | OUCSFTP | OUCS VAX (FTP) - Experimental                            |
|   | 0234 | 223 | 519 | 191             | REVSFTP | ROE Starlink VAX (FTP)                                   |
|   | 0234 | 223 | 519 | 191             | RLDAFTP | Rutherford DCS 11/70 (FTP)                               |
|   | 0234 | 223 | 519 | 191             | RLGBFTP | RL GEC (FTP)                                             |
|   | 0234 | 223 | 519 | 191             | RLIBFTP | RL IBM 370 CMS (FTP)                                     |
|   | 0234 | 223 | 519 | 191             | RLPCFTP | L Prime C (FTP)                                          |
|   | 0234 | 223 | 519 | 191             | SERC    | Gateway to SERCNET at Rutherford                         |
|   | 0234 | 223 | 519 | 191             | SERCENQ | SERCNET Acc & P/word Fac.                                |
|   | 0234 | 223 | 519 | 191             | SYPEFTP | Surrey Prime 550 (FTP)                                   |
|   | 0234 | 223 | 519 | 191             | UEAFTP  | East Anglia via SERC (FTP)                               |
|   | 0234 | 223 | 519 | 191             | ZUVSFTP | UCL Starlink VAX (FTP)                                   |
| A | 0234 | 223 | 519 | 19169           | SERCNET | R/ford XXX SERCnet g/way (=DARESBURY,=JANET?)            |
| ? | 0234 | 223 | 519 | 19169,.10404000 |         | Lancaster Uni                                            |
| B | 0234 | 223 | 519 | 19169,.36       |         | Oxford2                                                  |
| ? | 0234 | 223 | 519 | 19169,49000001  |         |                                                          |
| B | 0234 | 223 | 519 | 19169,.50200014 |         | Oxford                                                   |
| B | 0234 | 223 | 519 | 19169,.CPVC     |         | Omega VAX                                                |
| A | 0234 | 223 | 519 | 19169,.CPVD     |         | Merlin VAX                                               |
| B | 0234 | 225 | 621 | 126             | DECSS   | DEC Software Support VAX (=BEANO?)                       |



|   |      |     |     |       |         |                                                                 |
|---|------|-----|-----|-------|---------|-----------------------------------------------------------------|
|   | 0234 | 227 | 200 | 110   |         | GEAC 8000 ITI                                                   |
|   | 0234 | 227 | 200 | 112   | HPLB    | HPLB (Hewlett Packard Labs, Bristol)                            |
|   | 0234 | 227 | 230 | 230   | BRST    | University of Bristol                                           |
|   | 0234 | 227 | 230 | 23000 | BRISTOL | University of Bristol                                           |
|   | 0234 | 227 | 230 | 231   |         | DLLON Comp. & Manag. Services Ltd.                              |
|   | 0234 | 227 | 230 | 301   |         | GAC Computers Ltd.                                              |
|   | 0234 | 227 | 230 | 333   | AVON    | Avon Universities Computer Centre                               |
|   | 0234 | 227 | 230 | 33300 | AUCC    | Avon Universities Computer Centre                               |
|   | 0234 | 227 | 230 | 33398 | AUCCFTP | AUCC (FTP)                                                      |
| B | 0234 | 227 | 900 | 102   | BLAISE  | British Library Information System                              |
|   | 0234 | 227 | 900 | 10400 | ESTELLE | STC Estelle                                                     |
|   | 0234 | 227 | 900 | 14302 | ITT     | ITT Harlow (=ALCATEL?)                                          |
|   | 0234 | 231 | 300 | 101   |         | PRIME Office, Edinburgh                                         |
|   | 0234 | 231 | 300 | 102   |         | Forestry Commission FTP                                         |
|   | 0234 | 231 | 300 | 105   | LATTLOG | Lattice Logic LTD                                               |
|   | 0234 | 231 | 300 | 107   |         |                                                                 |
| B | 0234 | 231 | 354 | 354   | ERCC    | Edinburgh Regional Computer Centre                              |
|   | 0234 | 231 | 354 | 35419 | BUSHFTP | RCO 2988 (FTP)                                                  |
| B | 0234 | 231 | 354 | 35422 | ERCC    | ERCC - 2980, 2972 (EMAS) (=RCONET?)                             |
|   | 0234 | 232 | 500 | 124   | EXIS    | EXIS                                                            |
| I | 0234 | 233 | 458 | 158   | STAND   | St. Andrews University VAX                                      |
| B | 0234 | 233 | 458 | 15898 | STANFTP | St. Andrews Univ. (FTP)                                         |
|   | 0234 | 234 | 417 | 117   |         | ICL at Bracknell                                                |
|   | 0234 | 227 | 230 | 333   |         | ?                                                               |
| B | 0234 | 239 | 232 | 323   | EXETER1 | Exeter University                                               |
|   | 0234 | 239 | 232 | 32304 | EXTR    | University of Exeter                                            |
|   | 0234 | 241 | 200 | 107   |         |                                                                 |
|   | 0234 | 241 | 260 | 106   | SCRSX   | University of Strathclyde PDP-11/44 (RSX)                       |
| A | 0234 | 241 | 260 | 10604 |         | ? (,5020015,Birch/Bryan)                                        |
|   | 0234 | 241 | 260 | 260   | GLSG    | University of Glasgow (NFS)                                     |
| B | 0234 | 241 | 260 | 26004 |         | Glasgow                                                         |
|   | 0234 | 246 | 200 | 10243 |         | ICL West Gorton 'B' Service                                     |
|   | 0234 | 246 | 200 | 10248 |         | ICL West Gorton 'X' Service                                     |
|   | 0234 | 246 | 200 | 10277 |         | ICL West Gorton Perq                                            |
|   | 0234 | 246 | 240 | 240   | ICLL    | ICL at Letchworth (=Kidsgrove?) (NFS)                           |
|   | 0234 | 247 | 300 | 103   |         | MTIER Management Systems Ltd.                                   |
|   | 0234 | 247 | 300 | 10300 |         | Bridge, Switch                                                  |
|   | 0234 | 247 | 300 | 10340 |         | Bridge, (VAX/VMS)                                               |
|   | 0234 | 247 | 300 | 10345 |         | Bridge, (MUX(VT100))                                            |
|   | 0234 | 247 | 300 | 10346 |         | Bridge                                                          |
|   | 0234 | 247 | 302 | 022   | MHGA    | LDC at Martlesham                                               |
|   | 0234 | 248 | 300 | 106   |         | DWENT-SDC Search Service                                        |
|   | 0234 | 248 | 321 | 321   |         | DWENT-SDC Search Service                                        |
| B | 0234 | 251 | 248 | 248   | LIVE    | University of Liverpool                                         |
|   | 0234 | 252 | 724 | 241   | BSL     | BL Systems Ltd.                                                 |
|   | 0234 | 253 | 265 | 165   | LEEDS   | University of Leeds (NFS)                                       |
|   | 0234 | 253 | 300 | 124   | CAMTEC  | Camtec, Leicester                                               |
|   | 0234 | 253 | 300 | 12406 | CAMTEC  | Camtec, Leicester (hard copy printer)                           |
|   | 0234 | 258 | 200 | 106   | ARC     | Agricultural Research Council (GEC - Switch)                    |
|   | 0234 | 258 | 200 | 106   | EMALFTP | East Malling (FTP)                                              |
|   | 0234 | 258 | 200 | 106   | RESFTP  | RES (Rothampstead) - FTP                                        |
|   | 0234 | 258 | 200 | 10604 | AGRIFTP | AGRINET (CPSE) FTP                                              |
|   | 0234 | 258 | 200 | 10604 | AGRINET | AGRINET Gateway                                                 |
|   | 0234 | 258 | 200 | 10604 | EASTMAL | East Malling                                                    |
|   | 0234 | 258 | 240 | 242   | GECD    | GEC Computers Ltd at Dunstable                                  |
|   | 0234 | 258 | 240 | 24200 | MRCA    | GEC - Marconi Research Centre                                   |
| B | 0234 | 260 | 227 | 227   | MIDN    | MIDNET Gateway at Nottingham (University Leicester?) (=MIDNOT?) |
| B | 0234 | 261 | 456 | 8383  |         | Microlink                                                       |
| B | 0234 | 261 | 600 | 119   |         | Manchester                                                      |
|   | 0234 | 261 | 600 | 133   |         | IBM - SALE (also FTP)                                           |
| B | 0234 | 261 | 600 | 152   | UMDAFL  | University of Manchester Dataflow VAX                           |

|   |      |     |     |                |           |                                                        |
|---|------|-----|-----|----------------|-----------|--------------------------------------------------------|
|   | 0234 | 261 | 643 | 143            | UMRCC     | University of Manchester Regional Computer Centre      |
|   | 0234 | 261 | 643 | 14398          | UMRFTP    | UMRCC (FTP)                                            |
|   | 0234 | 261 | 643 | 210            | SALF      | Salford University                                     |
|   | 0234 | 261 | 643 | 21090          | SALFORD   | Salford -> GANNET                                      |
|   | 0234 | 261 | 643 | 21090          | NRS       | NRS                                                    |
| B | 0234 | 261 | 643 | 343            | FERRANTI  | Feranti Computer Systems                               |
|   | 0234 | 261 | 643 | 365            |           | ICLBRA                                                 |
|   | 0234 | 261 | 643 | 36543          |           | ICL West Gorton 'B' Service                            |
|   | 0234 | 261 | 643 | 36548          |           | ICL West Gorton 'X' Service                            |
|   | 0234 | 261 | 643 | 36577          |           | ICL West Gorton Perq (also FTP)                        |
|   | 0234 | 262 | 500 | 484            |           | Software Sciences Ltd.                                 |
| B | 0234 | 262 | 800 | 151            |           | CDM/EH (=Maidenhead?)                                  |
|   | 0234 | 262 | 800 | 43300          |           |                                                        |
| B | 0234 | 263 | 259 | 159            | NUMAC     | University of Newcastle                                |
|   | 0234 | 264 | 200 | 136            |           | Primenet                                               |
| B | 0234 | 270 | 500 | 115            |           | MAXXIM                                                 |
| B | 0234 | 270 | 500 | 142            |           | Farenham                                               |
| T | 0234 | 270 | 500 | 15             |           | Uni Brighton (GUEST,WELCOME)                           |
|   | 0234 | 270 | 712 | 217            | HATF      | Hatfield Polytechnic                                   |
|   | 0234 | 273 | 417 | 171            | DEC-RDG   | Digital Equipment Ltd Reading                          |
|   | 0234 | 273 | 417 | 217            | MODC      | Modcomp                                                |
|   | 0234 | 273 | 417 | 317            | DECR      | DEC at Reading                                         |
|   | 0234 | 274 | 200 | 103            |           | SHEFFIELD, University of, Dept.of Electronic & Elec... |
|   | 0234 | 274 | 200 | 103*DCODUCODUS |           | Codus                                                  |
|   | 0234 | 274 | 253 | 385            |           | DVY Computing Ltd.                                     |
|   | 0234 | 274 | 317 | 31             |           |                                                        |
|   | 0234 | 275 | 300 | 102            |           | GIS Ltd.                                               |
|   | 0234 | 275 | 312 | 212            | BOC       | British Oxygen (=The World Reporter??)                 |
|   | 0234 | 275 | 312 | 212            | DATASOLVE | as above                                               |
|   | 0234 | 275 | 312 | 212            | EUROLEX   | British Oxygen Company                                 |
|   | 0234 | 275 | 317 | 173            |           | Lynx Computers Ltd.                                    |
|   | 0234 | 275 | 317 | 177            |           | TELEFILE Computer Services Ltd.                        |
|   | 0234 | 275 | 317 | 177            | GSI       | GSI (NFS)                                              |
|   | 0234 | 278 | 228 | 282            |           | ICL Letchworth                                         |
|   | 0234 | 278 | 228 | 288            |           | ICL Letchworth                                         |
|   | 0234 | 284 | 400 | 108            |           | Culham, (VAX)                                          |
|   | 0234 | 284 | 400 | 123            | ALVEY     | Alvey Electronic Mail                                  |
| B | 0234 | 289 | 500 | 109            |           | UXB                                                    |
|   | 0234 | 290 | 468 | 168            | YORK      | York University PSS Gateway                            |
| B | 0234 | 290 | 468 | 168            | YORKFTP   | York University (FTP)                                  |
|   | 0234 | 290 | 468 | 168            |           | Gateway To DEC-10 At York                              |
|   | 0234 | 290 | 468 | 16804          | YORKTS    | York TS29 Port                                         |
|   | 0234 | 290 | 524 | 242            | RSRE      | Radio, Space Research Establishment                    |
|   | 0234 | 290 | 524 | 24203          | RSREDL    | RSRE                                                   |
|   | 0234 | 290 | 524 | 24204          | RSRESNK   | RSRE                                                   |
|   | 0234 | 290 | 524 | 24250          | RSREA     | Radio, Space Research Establishment for ALVEY mail     |
|   | 0234 | 290 | 840 | 111            | POLIS     | SCION                                                  |
|   | 0234 | 290 | 840 | 111            | SCICON    | SCICON, South England                                  |
|   | 0234 | 292 | 549 | 149            | DL        | SERC at Daresbury Laboratory                           |
|   | 0234 | 293 | 212 | 212            |           | DATASOLVE LTD.                                         |
|   | 0234 | 293 | 212 | 212            | BOC       | British Oxygen Company (NFS)                           |
| D | 0234 | 293 | 765 |                | ARTTEL    | British Library, Boston Spa                            |
|   | 0234 | 293 | 765 | 265            |           | British Library Lending Divi.                          |
|   | 0234 | 299 | 212 | 221            | NOLTON    | Nolton Communications Ltd. (NFS)                       |
|   | 0234 | 3   |     |                |           | Euronet                                                |
|   | 0234 | 307 | 813 |                | EUROINFO  | Euronet Diane Information Service                      |
|   | 0234 | 8   |     |                | TELEX     | UK Telex network                                       |
|   | 0234 | 892 | 992 | 0              | DECTELX   |                                                        |
| I | 0235 | 200 | 143 | 00165          |           |                                                        |
|   | 0238 |     |     |                | DK        | Denmark                                                |

|   |      |     |     |       |                                                           |
|---|------|-----|-----|-------|-----------------------------------------------------------|
|   | 0238 | 2   |     |       | Datapak                                                   |
| A | 0238 | 241 | 592 | 400   | Valby I/S Datacentralen                                   |
| A | 0238 | 241 | 745 | 600   | RECKU Univac in Copenhagen University                     |
|   | 0238 | 241 | 745 | 60000 | Recku Univac (Enter @@ENQ)                                |
|   | 0238 | 241 | 745 | 60002 | UDIKU                                                     |
| A | 0238 | 242 | 126 | 400   | Lyngby DTB; I/S Datacentralen                             |
| I | 0238 | 389 | 3   |       | Euronet Aarhus                                            |
|   | 0240 |     |     |       | S Sweden                                                  |
| I | 0240 | 181 | 559 | 76    | LIUIDA S Linkvping LiUIDA Teletex                         |
|   | 0240 | 2   |     |       | Datapak                                                   |
| A | 0240 | 200 | 002 | 05    | Uppsala STUNS VAX/UNIX KULING                             |
| I | 0240 | 200 | 044 | 4     | ENEAE                                                     |
| A | 0240 | 200 | 100 | 110   | Stockholm QZ/DEC-10                                       |
| A | 0240 | 200 | 100 | 120   | Stockholm QZ/CD Cyber 730                                 |
| O | 0240 | 200 | 100 | 203   | Uppsala, UU, Teknikum, NORD 100/500                       |
| A | 0240 | 200 | 100 | 205   | Uppsala, UU, Stuns, VAX 750                               |
| A | 0240 | 200 | 100 | 206   | Uppsala, UDAC/DECnet RTR18A                               |
| O | 0240 | 200 | 100 | 207   | Uppsala, UDAC, Cyber 835                                  |
| A | 0240 | 200 | 100 | 228   | Uppsala, UDAC/UPNET - Terminalnaet                        |
| A | 0240 | 200 | 100 | 232   | Uppsala, UDAC, IBM/GUTS (BASf 7/68 ?)                     |
| O | 0240 | 200 | 100 | 28    | Uppsala Upnet                                             |
| ? | 0240 | 200 | 100 | 30    | Umeaa VAX-750 Skogsh. Umeaa Univ                          |
| A | 0240 | 200 | 100 | 303   | Umeaa, UMDAC/BIOVAX                                       |
| A | 0240 | 200 | 100 | 304   | Umeaa, Skogshoegskolan, VAX 750                           |
| A | 0240 | 200 | 100 | 305   | Umeaa, UMDAC/DECnet RTR09A, (Vax 11/750)                  |
| A | 0240 | 200 | 100 | 30520 | Umeaa, UMDAC/BASUN                                        |
| A | 0240 | 200 | 100 | 30540 | Umeaa, UMDAC/UTB1 (Vax 11/780)                            |
| A | 0240 | 200 | 100 | 30550 | Umeaa, UMDAC/UTB2 (Vax 11/750)                            |
| A | 0240 | 200 | 100 | 30570 | Umeaa, UMDAC/OSTVAX (Vax 11/780, Hoegsk i Oe-sund)        |
| A | 0240 | 200 | 100 | 307   | Umeaa, UMDAC/Cyber 850                                    |
| D | 0240 | 200 | 100 | 312   | Luleaa, Tekn hoegsk, NORD 100                             |
| D | 0240 | 200 | 100 | 313   | Luleaa, Tekn hoegsk, NORD 100                             |
| A | 0240 | 200 | 100 | 328   | Umeaa, UMDAC/NUNET - Terminalnaet                         |
| D | 0240 | 200 | 100 | 33    | Umeaa VAX-11/780                                          |
| A | 0240 | 200 | 100 | 403   | Linkoeping, ULi/LIUIDA, uVAX-I                            |
| D | 0240 | 200 | 100 | 404   | Linkoeping, ULi/PDP 11/23 BULL                            |
| A | 0240 | 200 | 100 | 405   | Linkoeping, LIDAC, VAX 11/780 VIKTOR                      |
| A | 0240 | 200 | 100 | 407   | Linkoeping, LIDAC/DECnet RTR13A, uVAX-II                  |
| D | 0240 | 200 | 100 | 432   | Linkoeping, LIDAC/TEXAS - Terminalnaet                    |
| A | 0240 | 200 | 100 | 7     | Primenet                                                  |
| A | 0240 | 200 | 101 | 903   | Stockholm, SU, Psykologi, Prime 750                       |
| A | 0240 | 200 | 101 | 904   | Stockholm, QZ IBM (Amdahl)                                |
| A | 0240 | 200 | 101 | 905   | Stockholm, QZ, NFRVAX                                     |
| A | 0240 | 200 | 101 | 907   | Stockholm, QZ/DECnet RTR08A                               |
| A | 0240 | 200 | 101 | 914   | Stockholm, SU, Fysik, Vax 780                             |
| D | 0240 | 200 | 101 | 926   | Stockholm, KTH/KTHNET - Terminalnaet                      |
| A | 0240 | 200 | 101 | 928   | Stockholm, QZ/QZNET - Terminalnaet                        |
| O | 0240 | 200 | 102 | 06    | Uppsala UDAC uVAX-II RTR18A                               |
| O | 0240 | 200 | 102 | 07    | Uppsala CD Cyber 835                                      |
| A | 0240 | 200 | 102 | 7     | Stockholm DEC-10/Janus                                    |
| A | 0240 | 200 | 102 | 71    | Stockholm DEC-10/Janus                                    |
| A | 0240 | 200 | 201 | 603   | Goeteborg, CTH, Infobeh, VAX 750, Unix                    |
| D | 0240 | 200 | 201 | 604   | Goeteborg, GU, Pedagogiska inst, Prime 550                |
| A | 0240 | 200 | 201 | 605   | Goeteborg, GU, Statistiska inst, Prime 550                |
| D | 0240 | 200 | 201 | 606   | Goeteborg, CTH, Tillaempad Elektronik, VAX 750            |
| A | 0240 | 200 | 201 | 607   | Goeteborg, Tillaempad Elektronik/DECnet RTR31A (RTR18A ?) |
| A | 0240 | 200 | 201 | 628   | Goeteborg, GD/GUCNET - Terminalnaet                       |
| D | 0240 | 200 | 201 | 632   | Goeteborg Upnod                                           |
| A | 0240 | 200 | 205 | 4     | SCB                                                       |
| A | 0240 | 200 | 278 | 0     | Oerebro, Hoegskolan, Prime                                |

|   |      |     |     |         |          |                                                     |
|---|------|-----|-----|---------|----------|-----------------------------------------------------|
| A | 0240 | 200 | 292 | 6       |          | Karlstad, Hoegskolan, VAX 11/780                    |
| D | 0240 | 200 | 310 | 204     |          | Lund, Fysikum, NORD 500, Lucas                      |
| O | 0240 | 200 | 310 | 206     |          | Lund, Maxlab, NORD 100                              |
| A | 0240 | 200 | 310 | 207     |          | Lund, LDC/DECnet RTR46A, uVAX-II                    |
| A | 0240 | 200 | 310 | 20720   |          | Lund, LDC/GEMINI, Vax 8350                          |
| A | 0240 | 200 | 310 | 228     |          | Lund, LDC/LUNET - Terminalnaet                      |
|   | 0240 | 201 | 001 | 30      |          | Stockholm QZ/Amdahl                                 |
|   | 0240 | 201 | 002 | 03      |          | Uppsala Tekniskum Nord 100/500                      |
|   | 0240 | 5   |     |         | SWEDEN   | Swedish data network (Telepak)                      |
| I | 0240 | 500 | 025 | 3       | QZXB     | QZ by yet another route                             |
| I | 0240 | 500 | 025 | 7       |          | Stockholm, DEC, VAX                                 |
| I | 0240 | 501 | 50  |         |          | Scannet, Goteborg                                   |
| I | 0240 | 501 | 51  |         |          | Scannet, Helsingfors                                |
| I | 0240 | 501 | 52  |         |          | Stockholm KTH/TTDS                                  |
| I | 0240 | 501 | 531 | 0       | QZCOM    | QZ-COM - Stockholm University DEC-10                |
| I | 0240 | 501 | 532 | 0       | QZCB     | QZ Cyber                                            |
| I | 0240 | 501 | 533 | 0       | QZIB     | QZ Amdahl                                           |
| I | 0240 | 501 | 54  |         | UPPS     | Uppsala network, Sweden                             |
| I | 0240 | 501 | 550 | 3       |          | Gottenburg, Sweden                                  |
| I | 0240 | 501 | 582 | 8       | LUND     | Lund University                                     |
| I | 0240 | 501 | 60  |         |          | Helsinki CP9500 HYLK B7800                          |
| I | 0240 | 502 | 00  |         |          | Scannet, Stockholm                                  |
| I | 0240 | 502 | 01  |         |          | Denmark, Copenhagen Scannet                         |
| I | 0240 | 502 | 02  |         |          | Tandem Computers                                    |
| I | 0240 | 502 | 032 | 8       | QZXA     | QZ Sweden via reverse PAD (=UPNET?)                 |
| I | 0240 | 502 | 032 | 832     |          | Oden, Sweden                                        |
| I | 0240 | 502 | 033 | 2       | QZDA     | QZ DEC-10 Sweden                                    |
| I | 0240 | 502 | 04  |         |          | Prime Computers                                     |
| I | 0240 | 502 | 05  |         |          | Vaesteraas PAD ASEA Multics                         |
| I | 0240 | 502 | 52  |         |          | KEMIDATA                                            |
| I | 0240 | 502 | 53  |         | QZXB     | QZ by yet another route                             |
|   | 0240 | 515 | 330 |         |          | Amdahl                                              |
|   | 0242 |     |     |         | N        | Norway                                              |
|   | 0242 | 2   |     |         | NORWAY   | Norwegian data network (Datapak/Norpak)             |
|   | 0242 | 192 | 010 | 1013    |          | PSS DOC                                             |
| X | 0242 | 211 | 000 | 00107   | OSLO     | DEC-1099 DEC-net/PSI at Oslo University             |
| D | 0242 | 211 | 000 | 001*D02 |          | Oslo univ BRU-nett UNINETT                          |
| D | 0242 | 211 | 000 | 001*D03 | OSLO     | DEC-10 at Oslo University                           |
| D | 0242 | 211 | 000 | 00100   |          | Oslo univ DEC-1099 UNINETT                          |
| D | 0242 | 211 | 000 | 002     |          | Oslo Scannet NSI Nord-100                           |
| D | 0242 | 211 | 000 | 01018   | DATA PIN | DATAPAK Info - Norway                               |
| B | 0242 | 211 | 000 | 074     |          | Oslo VAX                                            |
| T | 0242 | 223 | 000 | 00151   | RBK      | Cyber 170 at IFE (Energy Research Centre)           |
| T | 0242 | 223 | 000 | 001*D00 | RBK      | Cyber 170 at IFE, Kjeller RBK UNINETT               |
| D | 0242 | 223 | 000 | 002     |          | Kjeller FFI UNINETT                                 |
| D | 0242 | 245 | 000 | 00101   | BERGEN   | Univac at Bergen University (UNINETT)               |
| D | 0242 | 245 | 000 | 001*D00 | BERGEN   | Univac at Bergen University                         |
| A | 0242 | 245 | 013 | 4       |          | BBB Mailbox (Bergen By Byte)                        |
|   | 0242 | 253 | 000 | 001*D11 |          | Trondheim UNINETT RUNIT UNIVAC                      |
| T | 0242 | 253 | 000 | 00101   | RNI      | Univac at Trondheim University                      |
| X | 0242 | 253 | 000 | 00103   |          | Trondheim RUNIT UNINETT VAX-780 (=PUNIT (EANNET) ?) |
| T | 0242 | 253 | 000 | 00104   |          | Trondheim NLHT UNINETT VAX-750                      |
|   | 0242 | 265 | 000 | 001*D00 |          | Tromso UNINETT U of Tromso, Cyber 171               |
|   | 0242 | 253 | 000 | 001*D11 | RUNIT    | Univac at Trondheim University                      |
|   | 0242 | 265 | 000 | 001*D81 |          | Tromso UNINETT U of Tromso, NORD-10                 |
|   | 0242 | 265 | 000 | 001*D82 |          | Tromso UNINETT U of Tromso, NORD-100                |
|   | 0242 | 265 | 000 | 001*D83 |          | Tromso UNINETT U of Tromso, NORD-500                |
|   | 0242 | 265 | 000 | 00101   | TROMSOE  | Cyber 170 at Tromsø University (UNINETT)            |
|   | 0242 | 265 | 000 | 001*D81 | TROMSO   | ELAN at Tromsø University                           |
| X | 0242 | 265 | 000 | 106     |          | PORTACOM (PORTACOM)                                 |
|   | 0244 |     |     |         | SF       | Finland                                             |
|   | 0244 | 2   |     |         |          | Datapak (Finpak)                                    |

|    |      |     |     |         |                                             |
|----|------|-----|-----|---------|---------------------------------------------|
| A  | 0244 | 202 | 006 |         | Economics HP 3000                           |
| A  | 0244 | 202 | 007 |         | University of Helsinki, B7800 (=CANDE ?)    |
| A  | 0244 | 202 | 008 |         | VTKK (Staten DC) IBM 360                    |
| A  | 0244 | 202 | 012 |         | U o Helsinki Mopo Mikko3                    |
| A  | 0244 | 203 | 008 | HELVA   | High Energy Physics Vax 11/750              |
| A  | 0244 | 203 | 017 |         | U of Technology DEC-20                      |
| D  | 0244 | 231 | 006 |         | Technical University of Tampere VAX         |
| A  | 0244 | 253 | 001 |         | Tech U of Lappeenranta VAX/VMS              |
| A  | 0244 | 261 | 001 |         | U of Vaasa VAX/VMS                          |
| A  | 0244 | 273 | 002 |         | University of Joensuu VAX                   |
| D  | 0248 | 321 | 321 |         | DWENT-SDC Search Service                    |
|    | 0262 |     |     | D       | Germany                                     |
|    | 0262 | 3   |     |         | Euronet                                     |
| X  | 0262 | 307 | 4   |         | INFAS                                       |
|    | 0262 | 4   |     | GERMANY | German data network (Datex-P)               |
| I  | 0262 | 428 | 462 | 10706   |                                             |
| I  | 0262 | 428 | 479 | 11065   |                                             |
| D  | 0262 | 432 | 210 | 43002   | Apple                                       |
| Ar | 0262 | 432 | 210 | 93001   | Quick-Com                                   |
| Y  | 0262 | 442 | 010 | 49132   |                                             |
| O  | 0262 | 442 | 110 | 40325   | OKI                                         |
| Y  | 0262 | 442 | 110 | 49130   | PAD Frankfurt                               |
| Y  | 0262 | 442 | 110 | 49133   |                                             |
| Y  | 0262 | 442 | 110 | 49230   |                                             |
| I  | 0262 | 442 | 151 | 40327   | KIS (info)                                  |
| I  | 0262 | 442 | 210 | 49331   |                                             |
| A  | 0262 | 442 | 210 | 90371   | elma-mailbox (~pim)                         |
| Y  | 0262 | 442 | 210 | 99632   |                                             |
| O  | 0262 | 442 | 310 | 40312   | Bibliothek Chemie                           |
| I  | 0262 | 442 | 310 | 90306   | Chemie                                      |
| I  | 0262 | 442 | 410 | 40341   | RMI Mailbox Aachen                          |
| I  | 0262 | 442 | 433 | 40307   | CMES                                        |
| O  | 0262 | 442 | 461 | 40343   |                                             |
| Y  | 0262 | 443 | 000 | 49234   |                                             |
| A  | 0262 | 443 | 000 | 90314   | ?                                           |
| Y  | 0262 | 443 | 000 | 99131   |                                             |
| I  | 0262 | 444 | 000 | 90314   | CCC Hamburg (Clinch), Hackerbox (1 line...) |
| Y  | 0262 | 444 | 000 | 90330   | Allgemeine Bank der Niederlande             |
| O  | 0262 | 444 | 000 | 90342   | Batig Beteiligungen GmbH                    |
| A  | 0262 | 444 | 000 | 90374   | Master Control System (MCS) Hamburg         |
| Y  | 0262 | 444 | 000 | 99132   |                                             |
| Y  | 0262 | 444 | 441 | 40317   | Osnabrueck, Driverstr.24, 2848 Vechta       |
| I  | 0262 | 445 | 110 | 30317   | Metereologie                                |
| I  | 0262 | 445 | 110 | 90323   | Bibliothek                                  |
| I  | 0262 | 446 | 154 | 40371   | DECATES - Oberramstadt                      |
| Y  | 0262 | 446 | 210 | 49330   |                                             |
| Y  | 0262 | 446 | 810 | 49131   |                                             |
| Y  | 0262 | 446 | 810 | 49132   |                                             |
| O  | 0262 | 446 | 900 | 30331   | IBD Online Frankfurt a.M.                   |
| I  | 0262 | 446 | 900 | 40318   | Chemie                                      |
| Y  | 0262 | 446 | 900 | 49231   |                                             |
| Y  | 0262 | 446 | 900 | 49232   |                                             |
| I  | 0262 | 446 | 900 | 90286   | RZ                                          |
| Y  | 0262 | 446 | 900 | 99133   |                                             |
| O  | 0262 | 447 | 071 | 10303   | Organische Chem.                            |
| Y  | 0262 | 447 | 110 | 49134   |                                             |
| I  | 0262 | 447 | 114 | 9236    | Emery                                       |
| I  | 0262 | 447 | 127 | 90344   |                                             |
| Y  | 0262 | 447 | 310 | 40313   | Online-Literaturdok.                        |
| A  | 0262 | 447 | 531 | 40310   | Chemie                                      |
| I  | 0262 | 448 | 136 |         | Luma Uni                                    |
| O  | 0262 | 448 | 136 | 90323   | Genesys EDV-Systeme                         |
| Y  | 0262 | 448 | 210 | 49630   |                                             |

|    |      |     |     |       |                                   |
|----|------|-----|-----|-------|-----------------------------------|
| A  | 0262 | 448 | 900 | 30368 | Phoenix                           |
| Y  | 0262 | 448 | 900 | 49130 |                                   |
| A  | 0262 | 448 | 900 | 90313 | Max Planck Institut               |
| Y  | 0262 | 448 | 900 | 90341 | LMU Bibliothek                    |
| Y  | 0262 | 448 | 900 | 99632 |                                   |
| I  | 0262 | 449 | 310 | 90312 | Apel Hans-Joerg                   |
| I  | 0262 | 452 | 000 | 21721 | ???                               |
| I  | 0262 | 450 | 000 | 90184 |                                   |
| I  | 0262 | 451 | 104 | 2301  |                                   |
| O  | 0262 | 452 | 010 | 40116 | AEG-Telefunken                    |
| I  | 0262 | 452 | 010 | 40179 | RZ Uni Essen                      |
| I  | 0262 | 452 | 020 | 40120 | Apotheke Dr.Schiemes              |
| I  | 0262 | 452 | 080 | 40381 | DVO Datenverarbeitung             |
| I  | 0262 | 452 | 090 | 832   | ?                                 |
| I  | 0262 | 452 | 101 | 30030 | 3M Mailbox                        |
| I  | 0262 | 452 | 101 | 40030 | 3M Mailbox                        |
| I  | 0262 | 452 | 110 | 40001 | RZU Duesseldorf (ND100)           |
| I  | 0262 | 452 | 110 | 40005 | CIERR 1402                        |
| I  | 0262 | 452 | 110 | 40016 | ADV-Orga-Meyer & Co.              |
| I  | 0262 | 452 | 110 | 40018 | ADV-Orga-Meyer & Co.              |
| Ar | 0262 | 452 | 110 | 40026 | Primenet Stadt Duesseldorf,       |
| I  | 0262 | 452 | 110 | 40063 | ADAC                              |
| I  | 0262 | 452 | 110 | 40080 | Uni Duesseldorf                   |
| Dr | 0262 | 452 | 110 | 40099 |                                   |
| D  | 0262 | 452 | 110 | 40105 | RZU Duesseldorf (Siemens 7.570)   |
| D  | 0262 | 452 | 110 | 40123 | Data General                      |
| Ar | 0262 | 452 | 110 | 40130 |                                   |
| Dr | 0262 | 452 | 110 | 40132 |                                   |
| A  | 0262 | 452 | 110 | 40134 | MCKDU VM/SP                       |
| I  | 0262 | 452 | 110 | 40211 | Applid-Data-Research              |
| I  | 0262 | 452 | 110 | 40325 | OKI-GmbH                          |
| I  | 0262 | 452 | 110 | 90371 | Software-Express                  |
| I  | 0262 | 452 | 210 | 0     |                                   |
| Yr | 0262 | 452 | 210 | 40002 | DIMDI Fep 1 Koeln                 |
| Ar | 0262 | 452 | 210 | 40004 | Primenet (MicroVMS V4.5)          |
| A  | 0262 | 452 | 210 | 40006 | DIMDI Fep 2 Koeln (Medical docs)  |
| I  | 0262 | 452 | 210 | 40015 | Kaufhof AG                        |
| I  | 0262 | 452 | 210 | 40027 | ADAC                              |
| Ar | 0262 | 452 | 210 | 40035 | Primenet                          |
| A  | 0262 | 452 | 210 | 40104 | DIMDI1 (German Med. Inst., Koeln) |
| Yr | 0262 | 452 | 210 | 40119 |                                   |
| O  | 0262 | 452 | 210 | 40136 | AEG-Telefunken                    |
| I  | 0262 | 452 | 210 | 40202 | Allianz RZ                        |
| I  | 0262 | 452 | 210 | 40203 | Allianz RZ                        |
| I  | 0262 | 452 | 210 | 90265 | RZ Uni Koeln                      |
| I  | 0262 | 452 | 210 | 90304 | Allianz RZ                        |
| I  | 0262 | 452 | 210 | 90305 | Allianz RZ                        |
| I  | 0262 | 452 | 210 | 90349 | Kaufhof AG (RZ 2)                 |
| D  | 0262 | 452 | 210 | 90510 | Geophysik und Meteorologie        |
| Ir | 0262 | 452 | 210 | 93001 | ?                                 |
| A  | 0262 | 452 | 241 | 24104 | VAX                               |
| A  | 0262 | 452 | 241 | 24105 | GMD2                              |
| A  | 0262 | 452 | 241 | 24134 | GMDZI                             |
| A  | 0262 | 452 | 280 | 40082 | GMD (TSO)                         |
| A  | 0262 | 452 | 280 | 40187 | BNVA Bonn VAX (PI)                |
| Ar | 0262 | 452 | 280 | 40191 | Infas GmbH (VM)                   |
| D  | 0262 | 452 | 280 | 90020 | Amtsgericht                       |
| A  | 0262 | 452 | 310 | 40003 | EMX1 EMEX-Mailbox (Guest)         |
| I  | 0262 | 452 | 310 | 40017 | Primenet                          |
| O  | 0262 | 452 | 310 | 40103 | AEG-Telefunken                    |
| A  | 0262 | 452 | 310 | 42100 | Informatik                        |
| A  | 0262 | 452 | 310 | 42144 | UNIDO University of Dortmund      |
| I  | 0262 | 452 | 310 | 40017 | Primenet                          |

|    |      |     |     |       |        |                                                                |
|----|------|-----|-----|-------|--------|----------------------------------------------------------------|
| I  | 0262 | 452 | 310 | 45100 |        | Uni Dortmund (Siemens 7.760)                                   |
| A  | 0262 | 452 | 310 | 9304  |        | Dortmund                                                       |
| D  | 0262 | 452 | 340 | 40140 |        | Primenet = RZU Bochum (CDL 855) ??                             |
| A  | 0262 | 452 | 340 | 40194 | RUB    | Cyber 205 (=855?), Ruhr University - Bochum (RUB)              |
| D  | 0262 | 452 | 410 | 40149 |        | Aachener + Muenchener Versicherung                             |
| I  | 0262 | 452 | 410 | 90014 |        | ???                                                            |
| I  | 0262 | 452 | 410 | 90528 |        | rmi-aachen                                                     |
| A  | 0262 | 452 | 410 | 90832 |        | RMI Datentechnik Aachen                                        |
| I  | 0262 | 452 | 433 | 40307 |        | OPTEL (Ruehlemann-Box)                                         |
| I  | 0262 | 452 | 461 | 90509 |        | Kfz Juelich                                                    |
| A  | 0262 | 452 | 710 | 40240 |        | Uni Siegen, FB Physik (VAX 11/750)                             |
| D  | 0262 | 452 | 931 | 40196 |        | Handwerkskammer (HWK) Arnsberg                                 |
| I  | 0262 | 453 | 000 | 0414  |        | GFC-AG                                                         |
| D  | 0262 | 453 | 000 | 20104 |        | Vax                                                            |
| D  | 0262 | 453 | 000 | 217   | HMI    | HMI in Berlin                                                  |
| A  | 0262 | 453 | 000 | 21711 |        | Siemens                                                        |
| A  | 0262 | 453 | 000 | 21712 |        | Siemens                                                        |
| A  | 0262 | 453 | 000 | 21713 |        | Hahn-Meitner-Institut Berlin                                   |
| D  | 0262 | 453 | 000 | 21714 |        | ???                                                            |
| D  | 0262 | 453 | 000 | 40013 |        | Uni Berlin                                                     |
| Y  | 0262 | 453 | 000 | 40014 |        | GFC AG                                                         |
| Ar | 0262 | 453 | 000 | 40023 | BERLIN | Tech. Univ. Berlin (Computer Science)                          |
| I  | 0262 | 453 | 000 | 40027 |        | ADAC                                                           |
| I  | 0262 | 453 | 000 | 40112 |        | ABC Barkredit Bank                                             |
| I  | 0262 | 453 | 000 | 40166 |        | David Verlag                                                   |
| I  | 0262 | 453 | 000 | 40509 |        | COM-Box Berlin                                                 |
| A  | 0262 | 453 | 000 | 20205 |        | CN01                                                           |
| A  | 0262 | 453 | 000 | 43109 |        | netmbx, Berlin                                                 |
| A  | 0262 | 453 | 000 | 90055 |        | COM.BOX, Berlin                                                |
| A  | 0262 | 453 | 000 | 90864 |        | ? (GUEST)                                                      |
| I  | 0262 | 453 | 002 | 17    | HMI    | Hans Mietner Institute in Berlin                               |
| I  | 0262 | 453 | 004 | 0023  |        | Uni Berlin                                                     |
| I  | 0262 | 453 | 210 | 40017 |        | tymnet-gateway                                                 |
| I  | 0262 | 454 | 000 | 30029 |        |                                                                |
| A  | 0262 | 454 | 000 | 30035 |        | (immediately drops the line)                                   |
| A  | 0262 | 454 | 000 | 30041 |        | COM-LETE (?) (command prefix is '*')                           |
| A  | 0262 | 454 | 000 | 30046 |        | (immediately drops the line)                                   |
| O  | 0262 | 454 | 000 | 30071 |        |                                                                |
| A  | 0262 | 454 | 000 | 30090 |        | (cierr 1402)                                                   |
| A  | 0262 | 454 | 000 | 30104 |        | ? ("INVALID COMMAND SYNTAX")                                   |
| A  | 0262 | 454 | 000 | 30105 |        |                                                                |
| A  | 0262 | 454 | 000 | 30110 |        | Host                                                           |
| A  | 0262 | 454 | 000 | 30113 |        | (cierr 1402)                                                   |
| A  | 0262 | 454 | 000 | 30138 |        | ? (no reaction)                                                |
| D  | 0262 | 454 | 000 | 30150 |        |                                                                |
| D  | 0262 | 454 | 000 | 30158 |        |                                                                |
| A  | 0262 | 454 | 000 | 30175 |        | ? ("INVALID COMMAND SYNTAX")                                   |
| D  | 0262 | 454 | 000 | 30187 |        | E2000 Hamburg VAX                                              |
| O  | 0262 | 454 | 000 | 30201 |        | Hasylab VAX (user/user)                                        |
| A  | 0262 | 454 | 000 | 30202 |        | HERA Magnet Measurement VAX 750 (=Krista Cryogenics Control ?) |
| A  | 0262 | 454 | 000 | 30215 |        | ? ("INVALID COMMAND SYNTAX")                                   |
| D  | 0262 | 454 | 000 | 30259 |        |                                                                |
| D  | 0262 | 454 | 000 | 30261 |        |                                                                |
| A  | 0262 | 454 | 000 | 30296 |        | DFH2001I                                                       |
| A  | 0262 | 454 | 000 | 30502 |        |                                                                |
| I  | 0262 | 454 | 000 | 30519 |        |                                                                |
| A  | 0262 | 454 | 000 | 30566 |        | DFH2001I                                                       |
| O  | 0262 | 454 | 000 | 30578 |        | Primenet 20.0.4 DREHH                                          |
| I  | 0262 | 454 | 000 | 40014 |        | Hahn Egon RZ !! Code: EBCDIC !!                                |
| I  | 0262 | 454 | 000 | 40015 |        | ???                                                            |
| Y  | 0262 | 454 | 000 | 40042 |        | ???                                                            |

|   |      |     |     |        |        |                                               |
|---|------|-----|-----|--------|--------|-----------------------------------------------|
| D | 0262 | 454 | 000 | 40044  |        | Primenet MUF                                  |
| I | 0262 | 454 | 000 | 40053  |        | SCHERAX                                       |
| Y | 0262 | 454 | 000 | 40078  |        | ???                                           |
| A | 0262 | 454 | 000 | 40082  |        | ? (no reaction)                               |
| I | 0262 | 454 | 000 | 40103  |        | Airbus                                        |
| I | 0262 | 454 | 000 | 40109  |        | ???                                           |
| I | 0262 | 454 | 000 | 40111  |        | BADGER                                        |
| D | 0262 | 454 | 000 | 40198  |        | Argus IPP-Vax                                 |
| I | 0262 | 454 | 000 | 43100  |        | ADV-Orga-Meyer & Co.                          |
| A | 0262 | 454 | 000 | 50233  |        | Altos Hamburg (althh) (Gast)                  |
| I | 0262 | 454 | 000 | 8001   | DYVA   | MARK J VAX at DESY                            |
| I | 0262 | 454 | 000 | 90047  |        | AEG-Telefunken                                |
| A | 0262 | 454 | 000 | 90092  |        | Data-General                                  |
| A | 0262 | 454 | 000 | 90184  |        | Uni Hamburg (VAX) (=UKE?)                     |
| I | 0262 | 454 | 000 | 90194  |        | Verbraucherbank AG                            |
| O | 0262 | 454 | 000 | 90241  |        | ???                                           |
| I | 0262 | 454 | 000 | 90258  |        | Desy ( Vax )                                  |
| I | 0262 | 454 | 000 | 90558  |        | Philips VAX                                   |
| D | 0262 | 454 | 000 | 90560  | EMBLHH | EMBL VAX at Hamburg (Eur.Molecular Biol.Lab.) |
| I | 0262 | 454 | 000 | 905602 |        | ???                                           |
| A | 0262 | 454 | 000 | 90582  |        | Desy V.24 Switch                              |
| A | 0262 | 454 | 000 | 91110  |        | Deutsche Mailbox 1                            |
| A | 0262 | 454 | 000 | 91120  |        | Deutsche Mailbox 2                            |
| A | 0262 | 454 | 000 | 92210  |        | DESYNET                                       |
| A | 0262 | 454 | 000 | 9306   | DYVA   | MARK J VAX at DESY                            |
| D | 0262 | 454 | 103 | 90161  |        | Astra Chemicals GmbH                          |
|   | 0262 | 454 | 106 | 40206  |        | RCA                                           |
| A | 0262 | 454 | 210 | 40064  |        | COMTES                                        |
| O | 0262 | 454 | 210 | 40108  |        | AEG-Telefunken                                |
| I | 0262 | 454 | 210 | 40145  |        | AEG-Telefunken                                |
| Y | 0262 | 454 | 210 | 40244  |        | AEG-Telefunken                                |
| O | 0262 | 454 | 210 | 42001  |        | Bremen                                        |
| I | 0262 | 454 | 210 | 90302  |        | Computerland VAX                              |
| O | 0262 | 454 | 298 | 43070  |        | Infex 2                                       |
| I | 0262 | 454 | 310 | 40545  |        | Kiel IMF                                      |
| A | 0262 | 454 | 410 | 30033  |        | Uni Oldenburg                                 |
| I | 0262 | 454 | 421 | 40045  |        | ADV-Orga-Meyer & Co.                          |
| I | 0262 | 454 | 488 | 40147  |        | Essmann Getraenke GmbH                        |
| I | 0262 | 455 | 110 | 40081  |        | Airbus                                        |
| I | 0262 | 455 | 110 | 40171  |        | Alli-Frischdienst                             |
| A | 0262 | 455 | 110 | 42330  |        | Uni Hannover (VM/370)                         |
| A | 0262 | 455 | 110 | 43020  |        | Nachrichtentechnik (VAX)                      |
| I | 0262 | 455 | 110 | 701    |        | Uni Hannover                                  |
| A | 0262 | 455 | 110 | 90192  |        | ???                                           |
| A | 0262 | 455 | 110 | 90835  |        | CosmoNet (GAST)                               |
| A | 0262 | 455 | 110 | 92200  |        | RZ                                            |
| D | 0262 | 455 | 151 | 40212  |        | AEG-Telefunken                                |
| I | 0262 | 455 | 152 | 90154  |        | Oldenburger Volksbank                         |
| I | 0262 | 455 | 210 | 40562  |        | Uni Bielefeld (CGK/TR440)                     |
| I | 0262 | 455 | 251 | 90192  |        | Paderborn                                     |
| D | 0262 | 455 | 251 | 90193  |        | Paderborn                                     |
| A | 0262 | 455 | 251 | 93020  |        | Uni Paderborn (4.3 BSD UNIX)                  |
| D | 0262 | 455 | 362 | 90057  |        | IUM                                           |
| I | 0262 | 455 | 410 | 40086  |        | Alli-Frischdienst                             |
| I | 0262 | 455 | 410 | 40162  |        | RZ                                            |
| I | 0262 | 455 | 410 | 40560  |        | Bibliothek                                    |
| I | 0262 | 455 | 421 | 043050 |        | ORION                                         |
| A | 0262 | 455 | 510 | 32804  |        | Uni Goettingen (choose VAX or IBM)            |
| I | 0262 | 455 | 521 | 90172  |        | Spar & Darlehenskassen                        |
| I | 0262 | 455 | 818 | 104    |        | Anders Frido GmbH                             |
| I | 0262 | 455 | 910 | 40094  |        | Essmann Getraenke GmbH                        |
| I | 0262 | 455 | 931 | 40095  |        | Ruhr AG                                       |



|   |      |     |     |       |                                                                                  |
|---|------|-----|-----|-------|----------------------------------------------------------------------------------|
| I | 0262 | 456 | 061 | 40097 | Polydress Plastic GmbH                                                           |
| I | 0262 | 456 | 102 | 4301  | DEC Frankfurt                                                                    |
| I | 0262 | 456 | 102 | 90145 | Nadler-Werke GmbH                                                                |
| I | 0262 | 456 | 103 | 40332 | Amann KG                                                                         |
| I | 0262 | 456 | 104 | 0250  | Tymnet                                                                           |
| A | 0262 | 456 | 106 | 40254 | Alfa Service Partner (Primenet)                                                  |
| I | 0262 | 456 | 106 | 90119 | Alfa Service Partner                                                             |
| I | 0262 | 456 | 110 | 40009 | IBM Centre for Info and Doc, Germany                                             |
| I | 0262 | 456 | 110 | 40037 | Control Data (Test.-Serv.C4,ZZA201,CDC)                                          |
| I | 0262 | 456 | 110 | 40076 | Autonet                                                                          |
| I | 0262 | 456 | 110 | 40105 | Nixdorf Computer                                                                 |
| I | 0262 | 456 | 110 | 40106 | Nixdorf Computer                                                                 |
| I | 0262 | 456 | 110 | 40107 | CN01                                                                             |
| I | 0262 | 456 | 110 | 40187 | WAX Bank FRA                                                                     |
| I | 0262 | 456 | 110 | 40240 | City-Bank FFM (Uni Bochum ??)                                                    |
| I | 0262 | 456 | 110 | 40245 | ??                                                                               |
| I | 0262 | 456 | 110 | 40250 | Tymnet (Id=Information)                                                          |
| I | 0262 | 456 | 110 | 40303 | American Express                                                                 |
| I | 0262 | 456 | 110 | 40305 | American Express                                                                 |
| I | 0262 | 456 | 110 | 40311 | AMC                                                                              |
| I | 0262 | 456 | 110 | 40365 | AMP                                                                              |
| I | 0262 | 456 | 110 | 90211 | Nixdorf Computer                                                                 |
| I | 0262 | 456 | 110 | 90212 | Nixdorf Computer                                                                 |
| I | 0262 | 456 | 110 | 90322 | American Express                                                                 |
| I | 0262 | 456 | 110 | 90347 | American Express                                                                 |
| I | 0262 | 456 | 121 | 40207 | ADV-Orga-Meyer & Co.                                                             |
| I | 0262 | 456 | 121 | 40217 | BAK                                                                              |
| I | 0262 | 456 | 121 | 40225 | BAK                                                                              |
| I | 0262 | 456 | 121 | 90580 | BAK                                                                              |
| I | 0262 | 456 | 131 | 40138 | Uni Mainz RZ                                                                     |
| I | 0262 | 456 | 131 | 40545 | RZ                                                                               |
| Y | 0262 | 456 | 131 | 90031 | Allg.Kreditversicherung                                                          |
| Y | 0262 | 456 | 151 | 40282 | ???                                                                              |
| A | 0262 | 456 | 151 | 40516 | Uni Darmstadt (Siemens 7.xxx)                                                    |
| A | 0262 | 456 | 151 | 40547 | GSI Darmstadt (EMMA-VAX 8600)                                                    |
| A | 0262 | 456 | 151 | 42807 | GMD Darmstadt (CADMUS 9240)                                                      |
| I | 0262 | 456 | 172 | 90070 | A-Kredit                                                                         |
| I | 0262 | 456 | 193 | 40082 | Apotheken Marketing                                                              |
| D | 0262 | 456 | 196 | 40095 | Data General Schwalbach                                                          |
| A | 0262 | 456 | 196 | 40107 | Int.Doc.Chem.                                                                    |
| A | 0262 | 456 | 210 | 40000 | Telebox der DBP (ID INF100,Telebox)                                              |
| A | 0262 | 456 | 210 | 40014 | ACF/VTAM                                                                         |
| A | 0262 | 456 | 210 | 40025 | Oeva                                                                             |
| A | 0262 | 456 | 210 | 40026 | HOST                                                                             |
| D | 0262 | 456 | 210 | 40027 | BASF/FER.VAX 8600                                                                |
| I | 0262 | 456 | 210 | 40097 | Nadler-Werke GmbH                                                                |
| I | 0262 | 456 | 210 | 40217 | Primenet                                                                         |
| I | 0262 | 456 | 210 | 40324 | Abacus                                                                           |
| D | 0262 | 456 | 210 | 40508 | VCON0.BASF.A6                                                                    |
| A | 0262 | 456 | 210 | 40516 | CN01                                                                             |
| A | 0262 | 456 | 210 | 40532 |                                                                                  |
| A | 0262 | 456 | 210 | 40580 | DYNAPAC MULTI-PAD.25                                                             |
| A | 0262 | 456 | 210 | 40581 | DYNAPAC MULTI-PAD.25                                                             |
| A | 0262 | 456 | 210 | 40582 |                                                                                  |
| A | 0262 | 456 | 210 | 90000 | Telebox der DBP                                                                  |
| I | 0262 | 456 | 221 | 3002  | EMBL European Microbiology Lab (or European Molecular Biological Lab.) (=ALKOR?) |
| D | 0262 | 456 | 221 | 40201 | DKFZ (Heidelberg)                                                                |
| I | 0262 | 456 | 221 | 40244 | Franny (=Max Planck VAX=MPI?)                                                    |
| I | 0262 | 456 | 310 | 40252 |                                                                                  |
| I | 0262 | 456 | 310 | 421   |                                                                                  |
| D | 0262 | 456 | 310 | 424   |                                                                                  |
| I | 0262 | 456 | 310 | 4302  |                                                                                  |

|    |      |     |     |        |         |                                              |
|----|------|-----|-----|--------|---------|----------------------------------------------|
| I  | 0262 | 456 | 340 | 40136  |         | Nadler-Werke GmbH                            |
| A  | 0262 | 456 | 410 | 30021  |         | HRZ-Giessen                                  |
| I  | 0262 | 456 | 410 | 40142  |         | Aachener + Muenchener Versicherung           |
| A  | 0262 | 456 | 410 | 90040  |         | HRZ Giessen (CDCNET-X.25)                    |
| I  | 0262 | 456 | 410 | 90828  |         | Ernaehrungswissenschaften                    |
| I  | 0262 | 456 | 441 | 90335  |         | Leerwe GmbH                                  |
| I  | 0262 | 456 | 615 | 142804 |         | GMD, Darmstadt                               |
| A  | 0262 | 456 | 673 | 13330  |         | Geonet 1 (ex IMCA)                           |
| A  | 0262 | 456 | 673 | 13340  |         | Geonet 3                                     |
| I  | 0262 | 456 | 673 | 30070  |         | IMCA-Mailbox, Solmser Str. 16, D-6419        |
|    |      |     |     |        |         | Haunetal-Staerklos                           |
| I  | 0262 | 456 | 721 | 40305  |         | Alfa Metalcraft Corp.                        |
| I  | 0262 | 456 | 810 | 40010  |         | Teleprint Saarbrueckener Zeitung             |
| I  | 0262 | 456 | 810 | 40071  |         | Nadler-Werke GmbH                            |
| I  | 0262 | 456 | 810 | 40076  | SAARBRU | Univ of Saarbruecken (Saarland RZ)           |
| A  | 0262 | 456 | 900 | 10174  |         | Beilstein Gmelin RZ (COMDOS ?)               |
| O  | 0262 | 456 | 900 | 10552  |         | FIZ-Technik                                  |
| O  | 0262 | 456 | 900 | 30040  |         | Nixdorf Computer                             |
| A  | 0262 | 456 | 900 | 40076  |         | Autonet                                      |
| D  | 0262 | 456 | 900 | 40106  |         | Nixdorf                                      |
| I  | 0262 | 456 | 900 | 40505  |         | AEG-Telefunken                               |
|    | 0262 | 456 | 900 | 40506  |         | AEG-Telefunken                               |
| A  | 0262 | 456 | 900 | 90125  |         |                                              |
| I  | 0262 | 456 | 900 | 90506  |         | Nixdorf                                      |
| I  | 0262 | 456 | 900 | 9308   |         | SYNTAX                                       |
| I  | 0262 | 457 | 010 | 40025  |         | ?                                            |
| A  | 0262 | 457 | 071 | 40266  |         | Zentrum fuer Datenverarbeitung               |
|    | 0262 | 457 | 071 | 40529  |         | Zentrale Verw.                               |
|    | 0262 | 457 | 071 | 90182  |         | ADW-Wirtschaftsberatung                      |
| D  | 0262 | 457 | 071 | 90249  |         | Bibliothek                                   |
| D  | 0262 | 457 | 110 | 10023  |         | Hohenheim Bibliothek                         |
| D  | 0262 | 457 | 110 | 211    |         | Rechenzentrum                                |
| Dr | 0262 | 457 | 110 | 40028  |         |                                              |
| Dr | 0262 | 457 | 110 | 40035  |         | Primenet !! No CTRL-P clr !!                 |
| B  | 0262 | 457 | 110 | 40124  |         | Stahl EDV-Service                            |
|    | 0262 | 457 | 110 | 40129  |         | Allg.Rentenanstalt                           |
|    | 0262 | 457 | 110 | 40147  |         | MAHU Verlag                                  |
| D  | 0262 | 457 | 110 | 90059  |         | Bibliothek                                   |
|    | 0262 | 457 | 110 | 90103  |         | Data General                                 |
|    | 0262 | 457 | 110 | 90246  |         | Hohenheim DokumentationsSt.                  |
| D  | 0262 | 457 | 110 | 90316  |         | RMI-Net                                      |
|    | 0262 | 457 | 110 | 90557  |         | Stahl EDV-Service                            |
| A  | 0262 | 457 | 110 | 90593  |         | Unix, Informatik (ifistg)                    |
|    | 0262 | 457 | 141 | 90098  |         | Aigner Buchhandlung                          |
| X  | 0262 | 457 | 210 | 40002  |         | V750                                         |
| Br | 0262 | 457 | 210 | 40025  |         | Badenia                                      |
|    | 0262 | 457 | 210 | 40031  |         | IITB-Datenverarbeitung                       |
| D  | 0262 | 457 | 210 | 40135  |         | Fraunhofer Institut                          |
| C  | 0262 | 457 | 210 | 40189  |         | Uni Karlsruhe, RZ (until 10-APR-88)          |
| X  | 0262 | 457 | 210 | 40248  |         | Uni Karlsruhe, LINK (=NETONE?)               |
| A  | 0262 | 457 | 210 | 42100  |         | Uni Karlsruhe, IRAV2 (VAX 8200)              |
| A  | 0262 | 457 | 210 | 42140  |         | Uni Karlsruhe, RZ (since 11-APR-88)          |
| D  | 0262 | 457 | 210 | 4303   |         | Telematik                                    |
| A  | 0262 | 457 | 247 | 40001  |         | INKA FIZ-Chemie 2 (German Centre for Tech.?) |
| A  | 0262 | 457 | 247 | 40141  |         | INKA FIZ-Chemie 1                            |
| A  | 0262 | 457 | 247 | 40211  | CASGER  | STN Internat. Karlsruhe                      |
| D  | 0262 | 457 | 310 | 90269  |         | RZ Bereich OE                                |
|    | 0262 | 457 | 310 | 921    |         | RZ                                           |
|    | 0262 | 457 | 351 | 40032  |         | AFD-Arbeitsgruppe F.DV                       |
| A  | 0262 | 457 | 531 | 90008  |         | Informationswissenschaften                   |
| D  | 0262 | 457 | 531 | 90094  |         | RZ                                           |
|    | 0262 | 457 | 552 | 90320  |         | Alno-Moebel                                  |

|   |      |     |     |       |     |                                             |
|---|------|-----|-----|-------|-----|---------------------------------------------|
| D | 0262 | 457 | 610 | 300   |     | Uni Freiburg, 9600bps                       |
| D | 0262 | 457 | 610 | 370   |     | Uni Freiburg, Sperry Univac                 |
| D | 0262 | 457 | 610 | 40079 |     | Albert Ludwig, Uni-Bibliothek               |
|   | 0262 | 457 | 610 | 40166 |     | AEG-Telefunken                              |
|   | 0262 | 457 | 610 | 40306 |     | Alpha-Buch GmbH                             |
| B | 0262 | 457 | 610 | 420   |     | Uni Freiburg, 4800bps                       |
| B | 0262 | 457 | 610 | 480   |     | Uni Freiburg, Sperry Univac                 |
| X | 0262 | 457 | 610 | 520   |     | Uni Freiburg, Uni Bibliothek                |
|   | 0262 | 457 | 641 | 40265 |     | Anders Ernst                                |
|   | 0262 | 457 | 721 | 40071 |     | Kienzle Computer                            |
|   | 0262 | 457 | 721 | 40072 |     | Kienzle Computer                            |
|   | 0262 | 457 | 721 | 40171 |     | Kienzle Computer                            |
|   | 0262 | 457 | 721 | 90004 |     | Kienzle Computer                            |
|   | 0262 | 457 | 721 | 90226 |     | Kienzle Computer                            |
|   | 0262 | 457 | 810 | 40222 |     | Dietrich Georg GmbH                         |
| B | 0262 | 458 | 151 | 40114 |     | Kejo GmbH (Josef Keller)                    |
| D | 0262 | 458 | 210 | 40114 |     | Bibliothek                                  |
|   | 0262 | 458 | 210 | 40120 |     | NCR                                         |
|   | 0262 | 458 | 510 | 30236 |     | Passau RZ                                   |
| D | 0262 | 458 | 710 | 40171 |     | Transfer Data Test GmbH                     |
|   | 0310 | 600 | 021 | 0     |     | Procter and Gamble                          |
|   | 0310 | 600 | 022 | 6     |     | Anistics                                    |
|   | 0310 | 600 | 022 | 6     |     | Interactive Market Systems (Anistics)       |
|   | 0310 | 600 | 023 | 2     |     | Scientific Timesharing                      |
|   | 0310 | 600 | 024 | 2     |     | Timesharing Resources                       |
|   | 0310 | 600 | 025 | 2     |     | Computer Science Corporation                |
|   | 0310 | 600 | 025 | 5     |     | Timesharing Associates                      |
|   | 0310 | 600 | 027 | 6     |     | Management Decision Systems Inc             |
|   | 0310 | 600 | 028 | 8     |     | SRI                                         |
|   | 0310 | 600 | 028 | 8     |     | SRI San Francisco (UNIX)                    |
|   | 0310 | 600 | 028 | 8     |     | Stanford Research Institute (SRI)           |
|   | 0310 | 600 | 030 | 3     |     | Scientific Timesharing                      |
|   | 0310 | 600 | 030 | 7     |     | Infomedia Corporation                       |
|   | 0310 | 600 | 032 | 3     |     | TRW Defence & Space Systems Group           |
|   | 0310 | 600 | 040 | 1     |     | TMCS Public Network                         |
|   | 0310 | 600 | 043 | 2     |     | Interactive Market Systems                  |
|   | 0310 | 600 | 046 | 6     |     | Bibliographic Retrieval Services            |
| B | 0310 | 600 | 058 | 1     |     | BRS                                         |
|   | 0310 | 600 | 063 | 3     |     | Public TYMNET/TRWNET Interlink              |
|   | 0310 | 600 | 079 | 3     |     | J&J Host                                    |
| B | 0310 | 600 | 105 | 3     |     |                                             |
|   | 0310 | 600 | 133 | 0     |     | MULTICS, HVN 862-3642                       |
|   | 0310 | 600 | 140 | 0     |     | TMCS Public Network                         |
| B | 0310 | 600 | 150 | 9     |     | Orbit (SDC)                                 |
| B | 0310 | 600 | 157 | 878   |     | BIX                                         |
| D | 0310 | 600 | 165 | 9     |     | BYTE Information Exchange (GUEST,GUEST)     |
| A | 0310 | 600 | 166 | 3     |     | People Link                                 |
|   | 0310 | 600 | 181 | 9     |     | TMCS Public Network                         |
|   | 0310 | 600 | 182 | 8     | FRX | Faifax Outdial Host (Tymnet)                |
|   | 0310 | 600 | 186 | 4     |     | SUNGARDS Central Computer Facility Networks |
|   | 0310 | 600 | 189 | 2     |     | Primenet (certain hours)                    |
| B | 0310 | 600 | 195 | 2     |     | VAX                                         |
| B | 0310 | 600 | 197 | 6     |     | Outdial NY                                  |
| A | 0310 | 600 | 197 | 7     |     |                                             |
|   | 0310 | 600 | 209 | 5     |     | COMODEX Online System                       |
|   | 0310 | 600 | 209 | 8     |     | D & B                                       |
|   | 0310 | 600 | 209 | 9     |     | D & B                                       |
|   | 0310 | 600 | 210 | 0     |     | D & B                                       |
|   | 0310 | 600 | 210 | 9     |     | TYMNET/15B (inter-link)                     |
| B | 0310 | 600 | 220 | 7,OUT |     | Outdial                                     |
|   | 0310 | 600 | 228 | 6     |     | Primenet TFGI                               |
|   | 0310 | 600 | 229 | 9     |     | CONSILIUM                                   |
|   | 0310 | 600 | 232 | 901*D | MFE | Magnetic Fusion Energy Centre, Lawrence     |

|   |      |     |     |                  |                                                   |
|---|------|-----|-----|------------------|---------------------------------------------------|
|   |      |     |     |                  | Livermore                                         |
| B | 0310 | 600 | 236 | 1                | Denver Oil&Gas                                    |
|   | 0310 | 600 | 241 |                  | Bank Of America                                   |
|   | 0310 | 600 | 245 | 3                | Primenet                                          |
| B | 0310 | 600 | 254 | 5                | SEISMO Centre for Seismic Studies                 |
| B | 0310 | 600 | 255 |                  | Outdial NY                                        |
| A | 0310 | 600 | 262 | 3                | VAX/VMS (GUEST ???)                               |
| B | 0310 | 600 | 262 | 3003             | VTINET                                            |
| B | 0310 | 600 | 262 | 460              | SUMEX                                             |
| B | 0310 | 600 | 263 | 5                | QUOTRON Wall Street (Boerse n.y.)                 |
| B | 0310 | 600 | 266 | 400              | SLAC SLAC on Tymnet                               |
| B | 0310 | 600 | 267 | 7                | The New York Times                                |
|   | 0310 | 600 | 269 | 4                | PVM3101,SPDS/MTAM, MLCM,VM/SP,STRATUS-1,STRATUS-2 |
|   | 0310 | 600 | 279 | 0                | VM/370                                            |
|   | 0310 | 600 | 286 | 4                | RCA Semicustom                                    |
| B | 0310 | 600 | 302 | 70000            | VTI NETONE                                        |
|   | 0310 | 600 | 307 | 9                | VM/370                                            |
|   | 0310 | 600 | 309 | 2                | TYMNET/Protected Access Service Sys.              |
|   |      |     |     |                  | Inter-link                                        |
|   | 0310 | 600 | 316 | 8                | VM/370                                            |
|   | 0310 | 600 | 321 | 4                | VM/370                                            |
|   | 0310 | 600 | 322 | 0                | VM/370                                            |
|   | 0310 | 600 | 322 | 1                | VM/370                                            |
|   | 0310 | 600 | 357 | 2                | NORTH AMERICA DATA CENTRE                         |
|   | 0310 | 600 | 360 | 4                | VM/370                                            |
|   | 0310 | 600 | 404 | 1                | RCA GLOBCOM'S PACKET SWITCHING SERICE             |
| A | 0310 | 600 | 412 | 9                | ?                                                 |
| A | 0310 | 600 | 413 | 1                | ?                                                 |
|   | 0310 | 600 | 413 | 7                | TSO, VM/370                                       |
|   | 0310 | 600 | 416 | 300              | Oakridge, Tennessee                               |
|   | 0310 | 600 | 417 | 4                | VM/370                                            |
|   | 0310 | 600 | 420 | 6                | MAINSTREAMS                                       |
|   | 0310 | 600 | 423 | 500              | Oakridge, Tennessee                               |
| B | 0310 | 600 | 430 | 5                | BIOVAX                                            |
|   | 0310 | 600 | 434 | 1                | (Host) 2 - VM/370, T - VM/370,1,3,4,A,C,E,Z       |
| A | 0310 | 600 | 436 | 5                | Toxnet (NLM=National Lib. of Medicine's)          |
| B | 0310 | 600 | 455 | 5                | VAX                                               |
|   | 0310 | 600 | 459 | 97               |                                                   |
|   | 0310 | 600 | 474 | 3                | TYMNET Info Service                               |
| X | 0310 | 600 | 502 | 0                | Outdial Fairfax                                   |
|   | 0310 | 600 | 522 | 9                | Uni.of Pencilvania School of Arts and Science     |
|   | 0310 | 600 | 526 | 7                | CHANEL 01                                         |
| X | 0310 | 600 | 531 | 7                | Outdial St.Louis                                  |
| B | 0310 | 600 | 532 | 0                | DEC Soft. Serv.                                   |
|   | 0310 | 600 | 556 | 9                | STRATUS/32                                        |
|   | 0310 | 600 | 557 | 1                | STRATUS/32                                        |
|   | 0310 | 600 | 560 | 3                | (Host) systems 1,2,3,4,5,C (5=Outdial)            |
| B | 0310 | 600 | 562 | 200              | FNAL Fermilab                                     |
| B | 0310 | 600 | 562 | 226              | Fermilab 2                                        |
| B | 0310 | 600 | 578 | 78               | BIX                                               |
| B | 0310 | 600 | 584 | 401              | Washington Post                                   |
| B | 0310 | 600 | 61  |                  | DIALOG1 Lockheed Info Systems                     |
|   | 0310 | 600 | 61* | DSDDIPSSL ORBIT2 | SDC Search Service                                |
|   | 0310 | 600 | 628 | 1                | EDCS                                              |
|   | 0310 | 600 | 628 | 3                | EDCS                                              |
|   | 0310 | 600 | 643 | 2                | EASYLINK                                          |
|   | 0310 | 600 | 643 | 4                | EASYLINK                                          |
|   | 0310 | 600 | 672 | 2                | International Network                             |
|   | 0310 | 600 | 68  |                  | Stanford SUMEX-AIM. Tenex op syst.                |
|   | 0310 | 600 | 683 | 2                | A&A DATANET (Systems 1,8,0,14)                    |
| X | 0310 | 600 | 701 | 7                | Outdial NY                                        |

|   |      |     |     |       |           |                                                |
|---|------|-----|-----|-------|-----------|------------------------------------------------|
|   | 0310 | 600 | 759 | 6     |           | (Host) A - VM/370, B - VM/370                  |
| ? | 0310 | 600 | 787 |       |           | Dallas                                         |
|   | 0310 | 601 | 79  |       |           | Berkley Univ.                                  |
|   | 0310 | 602 | 88  |       |           | Stanford Research Institute                    |
| B | 0310 | 611 | 467 |       |           | Cas Online Sys.                                |
|   | 0310 | 614 | 67  |       |           | Ohio CAS (Chemical Abstracts Service)          |
|   | 0310 | 617 | 001 | 38    |           | Multics                                        |
|   | 0310 | 647 | 911 | 065   |           | BIX Lexington Data Service                     |
|   | 0310 | 690 | 006 | 1*D   | DIALOG4   | Lockheed DIALOG service                        |
| B | 0310 | 690 | 080 | 3*D   | DIALOG3   | Lockheed DIALOG service                        |
|   | 0310 | 690 | 762 | 6     |           | Emery ADO                                      |
|   | 0311 | 0   |     |       | TELENET   | USA - Telenet                                  |
| B | 0311 | 002 | 130 | 0039  |           | ECLD                                           |
|   | 0311 | 020 | 100 | 02000 |           | Insco Systems                                  |
|   | 0311 | 020 | 100 | 022   |           | New Jersey Outdial 2400 bps (Area 201)         |
|   | 0311 | 020 | 100 | 02300 |           | American Information Services                  |
|   | 0311 | 020 | 100 | 02400 |           | The Information Bank                           |
|   | 0311 | 020 | 100 | 02500 |           | New Jersey Institute of Technology             |
|   | 0311 | 020 | 100 | 02800 |           | Olcott International Company                   |
|   | 0311 | 020 | 100 | 03700 |           | Informatics Inc                                |
|   | 0311 | 020 | 100 | 169   | MOUTON    |                                                |
|   | 0311 | 020 | 100 | 301   |           | New Jersey Outdial 1200 bps (Area 201)         |
|   | 0311 | 020 | 101 | 59200 |           | Scientific Process & Research Inc              |
|   | 0311 | 020 | 200 | 02100 |           | Scientific Timesharing                         |
|   | 0311 | 020 | 200 | 02200 |           | Scientific Timesharing                         |
| X | 0311 | 020 | 200 | 066   |           | Air Force                                      |
| T | 0311 | 020 | 200 | 099   | ICIB      | Information Council Incorporated B system      |
|   | 0311 | 020 | 200 | 1     | TELEMAIL  | US Telemail facility                           |
| X | 0311 | 020 | 200 | 10900 | CIS       | Chemical Information Systems                   |
| A | 0311 | 020 | 200 | 115   |           | Outdial 300 bps (Area 202)                     |
| A | 0311 | 020 | 200 | 116   |           | Outdial 1200 bps (Area 202)                    |
|   | 0311 | 020 | 200 | 117   |           | Distr. of Columbia Outdial 2400 bps (Area 202) |
| B | 0311 | 020 | 200 | 141   | TELEMAIL  | US Telemail facility (GT-Net)                  |
|   | 0311 | 020 | 200 | 14175 | TELEENQ   | Telenet Enquiry Service                        |
|   | 0311 | 020 | 200 | 14175 | TELEMAIL1 | US Telemail facility                           |
|   | 0311 | 020 | 200 | 14275 | TELENET   | US Telenet                                     |
|   | 0311 | 020 | 201 | 19500 |           | Gallaude College Computer Centre               |
|   | 0311 | 020 | 300 | 06400 |           | NCSS Bureau                                    |
|   | 0311 | 020 | 300 | 130   |           | Connecticut Outdial 1200 bps (Area 203)        |
|   | 0311 | 020 | 301 | 78900 |           | Yale University Computer Centre                |
|   | 0311 | 020 | 400 | 02900 | WATERLOO  | University of Waterloo                         |
|   | 0311 | 020 | 600 | 019   |           | Washington Outdial 1200 bps (Area 206)         |
|   | 0311 | 021 | 200 | 02000 |           | Bowne Timesharing                              |
|   | 0311 | 021 | 200 | 02500 |           | Interactive Market Systems (Anistics)          |
|   | 0311 | 021 | 200 | 02800 |           | Burroughs Corp (NYC data centre)               |
|   | 0311 | 021 | 200 | 141   | JPLM1     | Jet Propulsion Laboratory mail 1, USA          |
|   | 0311 | 021 | 200 | 142   | JPLM2     | Jet Propulsion Laboratory mail 2, USA          |
|   | 0311 | 021 | 200 | 14200 |           | GT-Net Telemail                                |
| A | 0311 | 021 | 200 | 315   |           | Outdial 300 bps (Area 212)                     |
| A | 0311 | 021 | 200 | 316   |           | Outdial 1200 bps (Area 212)                    |
| D | 0311 | 021 | 200 | 412   |           | Outdial 2400 bps (Area 212)                    |
| D | 0311 | 021 | 200 | 41200 |           | New York City Outdial (Area 212)               |
|   | 0311 | 021 | 201 | 39200 |           | Memorial Dose Distribution Computation Service |
|   | 0311 | 021 | 201 | 40600 |           | MAV Systems (300 bps)                          |
|   | 0311 | 021 | 201 | 57800 |           | IP Sharp Associates                            |
|   | 0311 | 021 | 201 | 58000 |           | SDL International (1200 bps)                   |
|   | 0311 | 021 | 201 | 58500 |           | SDL International (300 bps)                    |
|   | 0311 | 021 | 201 | 58800 |           | DSL Systems Inc                                |
|   | 0311 | 021 | 201 | 59500 |           | SDL International (1200 bps)                   |
|   | 0311 | 021 | 201 | 62000 |           | Telestat System Inc                            |
|   | 0311 | 021 | 201 | 62700 |           | Telestat Systems Inc                           |

|   |      |     |     |         |          |                                          |
|---|------|-----|-----|---------|----------|------------------------------------------|
|   | 0311 | 021 | 300 | 02200   |          | Interactive Systems Corporation          |
|   | 0311 | 021 | 300 | 02700   |          | Mellonics Information Centre             |
|   | 0311 | 021 | 300 | 029     |          | TRW Defence & Space Systems Group        |
| B | 0311 | 021 | 300 | 03300   | ORBIT    | Orbit                                    |
|   | 0311 | 021 | 300 | 03300*D | ORBIT    | SDC Search Service (300 bps)             |
|   | 0311 | 021 | 300 | 04400   |          | SDC Search Service (1200 bps)            |
| B | 0311 | 021 | 300 | 039     | USCAL2   | Univ. of Southern California             |
|   | 0311 | 021 | 300 | 04114   | IHW      | IHW                                      |
|   | 0311 | 021 | 300 | 04700   |          | University of Southern California        |
| B | 0311 | 021 | 300 | 048     | USCAL1   | University of Southern California        |
| B | 0311 | 021 | 300 | 170     |          | LRS Dialog 2                             |
| T | 0311 | 021 | 300 | 17000   | DIALOG5  | Lockheed Info Systems                    |
|   | 0311 | 021 | 300 | 17000*D | DIALOG2  | Lockheed DIALOG service                  |
| B | 0311 | 021 | 300 | 219     | CALTECH  | Caltech VAX 11/780                       |
|   | 0311 | 021 | 300 | 21908   | CALTECH  | Caltech VAX 11/780                       |
|   | 0311 | 021 | 300 | 21909   | CALTECH2 | Caltech VAX 11/780                       |
|   | 0311 | 021 | 300 | 412     |          | California Outdial 1200 bps (Area 213)   |
| A | 0311 | 021 | 300 | 413     |          | Outdial CA                               |
|   | 0311 | 021 | 300 | 668     |          | Adainfo                                  |
|   | 0311 | 021 | 301 | 353     | UCLA     | UCLA, USA                                |
|   | 0311 | 021 | 301 | 40300   |          | Marshall & Swift Publication             |
|   | 0311 | 021 | 400 | 117     |          | Outdial 300 bps (Area 214)               |
| A | 0311 | 021 | 400 | 118     |          | Texas Outdial 1200 bps (Area 214)        |
|   | 0311 | 021 | 500 | 022     |          | Pennsylvania Outdial 2400 bps (Area 215) |
|   | 0311 | 021 | 500 | 112     |          | Pennsylvania Outdial 1200 bps (Area 215) |
| A | 0311 | 021 | 600 | 020     |          | Outdial 300 bps (Area 216)               |
| A | 0311 | 021 | 600 | 021     |          | Ohio Outdial 1200 bps (Area 216)         |
|   | 0311 | 021 | 700 | 021     |          | University of Illinois - Urbana          |
|   | 0311 | 030 | 100 | 02000   | NLM      | National Library of Medicine             |
| A | 0311 | 030 | 100 | 02400   |          | The Source                               |
| B | 0311 | 030 | 100 | 038     |          | The Source (ID BSC131 SR3811)            |
| B | 0311 | 030 | 100 | 243     |          | ITT Dialcom                              |
|   | 0311 | 030 | 100 | 364     |          | Primesoft                                |
| A | 0311 | 030 | 100 | 38      |          | The Source                               |
| B | 0311 | 030 | 100 | 633     |          | Toxnet (NLM)                             |
|   | 0311 | 030 | 101 | 26500   |          | Informatics Inc                          |
|   | 0311 | 030 | 300 | 02000   |          | Computer Sharing Services                |
|   | 0311 | 030 | 300 | 021     |          | Colorado Outdial 2400 bps (Area 303)     |
|   | 0311 | 030 | 300 | 02300   |          | Broker Services Inc                      |
|   | 0311 | 030 | 300 | 115     |          | Colorado Outdial 1200 bps (Area 303)     |
|   | 0311 | 030 | 301 | 13100   |          | EDI Computer Services                    |
|   | 0311 | 030 | 301 | 13200   |          | EDI Computer Services                    |
|   | 0311 | 030 | 301 | 13300   |          | Energy Enterprises                       |
|   | 0311 | 030 | 500 | 121     |          | Florida Outdial 1200 bps (Area 305)      |
|   | 0311 | 030 | 501 | 16300   |          | Florida Computer Inc                     |
| D | 0311 | 030 | 508 | 793     |          | Miami Outdial (Area 305) ?               |
|   | 0311 | 031 | 200 | 02200   |          | National Computer Network of Chicago     |
|   | 0311 | 031 | 200 | 024     |          | Illinois Outdial 2400 bps (Area 217 ?)   |
|   | 0311 | 031 | 200 | 03100   |          | Continental Bank                         |
|   | 0311 | 031 | 200 | 03200   |          | Continental Bank                         |
|   | 0311 | 031 | 200 | 04900   |          | American Hospital Supply Corporation     |
|   | 0311 | 031 | 200 | 411     |          | Illinois Outdial 1200 bps (Area 217 ?)   |
|   | 0311 | 031 | 201 | 07300   |          | Commodity Information Services           |
|   | 0311 | 031 | 268 | 801     | ADPUSA   | ADP Network Services Ltd.                |
|   | 0311 | 031 | 300 | 024     |          | Michigan Outdial 2400 bps (Area 313)     |
|   | 0311 | 031 | 300 | 04000   |          | ADP Network Services                     |
|   | 0311 | 031 | 300 | 06200   |          | Merit International (MIT)                |
|   | 0311 | 031 | 300 | 216     |          | Michigan Outdial 1200 bps (Area 313)     |
|   | 0311 | 031 | 301 | 39800   |          | Merit Computer                           |
|   | 0311 | 031 | 400 | 07200   |          | Environmental DataNetwork Inc.           |
|   | 0311 | 031 | 401 | 06500   |          | McDonnell Douglas Automation (300 bps)   |
|   | 0311 | 031 | 401 | 06600   |          | McDonnell Douglas Automation (110 bps)   |
|   | 0311 | 031 | 401 | 06700   |          | McDonnell Douglas Automation (1200 bps)  |

|   |      |     |     |         |         |                                            |
|---|------|-----|-----|---------|---------|--------------------------------------------|
|   | 0311 | 031 | 401 | 61000   |         | McDonnell Douglas Automation (300 bps)     |
|   | 0311 | 031 | 500 | 02000   |         | Bibliographic Retrieval Services           |
| A | 0311 | 040 | 100 | 612     |         | Modemcity                                  |
| A | 0311 | 040 | 400 | 114     |         | Georgia Outdial 1200 bps (Area 404)        |
| A | 0311 | 040 | 800 | 021     |         | California Outdial 1200 bps? (Area 408)    |
|   | 0311 | 040 | 800 | 245     |         | Bridge                                     |
| B | 0311 | 040 | 800 | 246     |         | SCF                                        |
|   | 0311 | 041 | 201 | 4600    |         | On-Line Systems Inc                        |
|   | 0311 | 041 | 400 | 02000   |         | A.O. Smith Data Systems Divisions          |
|   | 0311 | 041 | 400 | 021     |         | Wisconsin Outdial 1200 bps (Area 414)      |
| B | 0311 | 041 | 500 | 020     |         | LRS-Dialog 2                               |
| A | 0311 | 041 | 500 | 02000   | DIALOG  | Lockheed Information Systems               |
|   | 0311 | 041 | 500 | 02000*D | DIALOG  | Lockheed DIALOG service                    |
| B | 0311 | 041 | 500 | 048     |         | LRS Dialog 2                               |
|   | 0311 | 041 | 500 | 04800   | DIALOG2 | Lockheed Information Systems 2             |
|   | 0311 | 041 | 500 | 04800*D | DIALOG1 | Lockheed DIALOG service                    |
|   | 0311 | 041 | 500 | 117     |         | California Outdial 1200 bps (Area 415)     |
| I | 0311 | 041 | 500 | 210     |         | Outdial USA                                |
| A | 0311 | 041 | 500 | 215     |         | Outdial (Area 415)                         |
| A | 0311 | 041 | 500 | 217     |         | Outdial (Area 415)                         |
| A | 0311 | 041 | 500 | 220     |         | Outdial 1200 bps (Area 415)                |
|   | 0311 | 041 | 500 | 48000   |         | Lockheed Information Systems (?)           |
| B | 0311 | 041 | 500 | 607     |         | BIONET                                     |
| B | 0311 | 041 | 500 | 609     |         | INTELLIGENETICS                            |
|   | 0311 | 041 | 501 | 23600   |         | Hydrocomp Inc (300 bps)                    |
|   | 0311 | 041 | 501 | 23700   |         | Hydrocomp Inc (1200 bps)                   |
|   | 0311 | 041 | 501 | 26800   |         | ITEL Corp (300 bps)                        |
|   | 0311 | 041 | 501 | 26900   |         | ITEL Corp (1200 bps)                       |
|   | 0311 | 041 | 501 | 59700   |         | Stanford Library Centre for Inform         |
|   |      |     |     |         |         | Processing                                 |
|   | 0311 | 041 | 501 | 59700   |         | Standard Centre for Information Processing |
| O | 0311 | 050 | 006 | 1       |         | Nuclear Research                           |
| A | 0311 | 050 | 300 | 020     |         | Outdial 300 bps (Area 503)                 |
| A | 0311 | 050 | 300 | 021     |         | Oregon Outdial 1200 bps (Area 503)         |
| B | 0311 | 050 | 500 | 060     |         | ICN (=LASL)                                |
|   | 0310 | 600 | 021 | 0       |         | Procter and Gamble                         |
|   | 0310 | 600 | 022 | 6       |         | Anistics                                   |
|   | 0310 | 600 | 022 | 6       |         | Interactive Market Systems (Anistics)      |
|   | 0310 | 600 | 023 | 2       |         | Scientific Timesharing                     |
|   | 0310 | 600 | 024 | 2       |         | Timesharing Resources                      |
|   | 0310 | 600 | 025 | 2       |         | Computer Science Corporation               |
|   | 0310 | 600 | 025 | 5       |         | Timesharing Associates                     |
|   | 0310 | 600 | 027 | 6       |         | Management Decision Systems Inc            |
|   | 0310 | 600 | 028 | 8       |         | SRI                                        |
|   | 0310 | 600 | 028 | 8       |         | SRI San Francisco (UNIX)                   |
|   | 0310 | 600 | 028 | 8       |         | Stanford Research Institute (SRI)          |
|   | 0310 | 600 | 030 | 3       |         | Scientific Timesharing                     |
|   | 0310 | 600 | 030 | 7       |         | Infomedia Corporation                      |
|   | 0310 | 600 | 032 | 3       |         | TRW Defence & Space Systems Group          |
|   | 0310 | 600 | 040 | 1       |         | TMCS Public Network                        |
|   | 0310 | 600 | 043 | 2       |         | Interactive Market Systems                 |
|   | 0310 | 600 | 046 | 6       |         | Bibliographic Retrieval Services           |
| B | 0310 | 600 | 058 | 1       |         | BRS                                        |
|   | 0310 | 600 | 063 | 3       |         | Public TYMNET/TRWNET Interlink             |
|   | 0310 | 600 | 079 | 3       |         | J&J Host                                   |
| B | 0310 | 600 | 105 | 3       |         |                                            |
|   | 0310 | 600 | 133 | 0       |         | MULTICS, HVN 862-3642                      |
|   | 0310 | 600 | 140 | 0       |         | TMCS Public Network                        |
| B | 0310 | 600 | 150 | 9       |         | Orbit (SDC)                                |
| B | 0310 | 600 | 157 | 878     |         | BIX                                        |
| D | 0310 | 600 | 165 | 9       |         | BYTE Information Exchange (GUEST,GUEST)    |
| A | 0310 | 600 | 166 | 3       |         | People Link                                |
|   | 0310 | 600 | 181 | 9       |         | TMCS Public Network                        |

|   |      |     |     |       |        |                                                   |
|---|------|-----|-----|-------|--------|---------------------------------------------------|
|   | 0310 | 600 | 182 | 8     | FRX    | Faifax Outdial Host (Tymnet)                      |
|   | 0310 | 600 | 186 | 4     |        | SUNGARDS Central Computer Facility Networks       |
|   | 0310 | 600 | 189 | 2     |        | Primenet (certain hours)                          |
| B | 0310 | 600 | 195 | 2     |        | VAX                                               |
| B | 0310 | 600 | 197 | 6     |        | Outdial NY                                        |
| A | 0310 | 600 | 197 | 7     |        |                                                   |
|   | 0310 | 600 | 209 | 5     |        | COMODEX Online System                             |
|   | 0310 | 600 | 209 | 8     |        | D & B                                             |
|   | 0310 | 600 | 209 | 9     |        | D & B                                             |
|   | 0310 | 600 | 210 | 0     |        | D & B                                             |
|   | 0310 | 600 | 210 | 9     |        | TYMNET/15B (inter-link)                           |
| B | 0310 | 600 | 220 | 7,OUT |        | Outdial                                           |
|   | 0310 | 600 | 228 | 6     |        | Primenet TFGI                                     |
|   | 0310 | 600 | 229 | 9     |        | CONSILIUM                                         |
|   | 0310 | 600 | 232 | 901*D | MFE    | Magnetic Fusion Energy Centre, Lawrence Livermore |
| B | 0310 | 600 | 236 | 1     |        | Denver Oil&Gas                                    |
|   | 0310 | 600 | 241 |       |        | Bank Of America                                   |
|   | 0310 | 600 | 245 | 3     |        | Primenet                                          |
| B | 0310 | 600 | 254 | 5     | SEISMO | Centre for Seismic Studies                        |
| B | 0310 | 600 | 255 |       |        | Outdial NY                                        |
| A | 0310 | 600 | 262 | 3     |        | VAX/VMS (GUEST ???)                               |
| B | 0310 | 600 | 262 | 3003  |        | VTINET                                            |
| B | 0310 | 600 | 262 | 460   |        | SUMEX                                             |
| B | 0310 | 600 | 263 | 5     |        | QUOTRON Wall Street (Boerse n.y.)                 |
| B | 0310 | 600 | 266 | 400   | SLAC   | SLAC on Tymnet                                    |
| B | 0310 | 600 | 267 | 7     |        | The New York Times                                |
|   | 0310 | 600 | 269 | 4     |        | PVM3101,SPDS/MTAM, MLCM,VM/SP,STRATUS-1,STRATUS-2 |
|   | 0310 | 600 | 279 | 0     |        | VM/370                                            |
|   | 0310 | 600 | 286 | 4     |        | RCA Semicustom                                    |
| B | 0310 | 600 | 302 | 70000 |        | VTI NETONE                                        |
|   | 0310 | 600 | 307 | 9     |        | VM/370                                            |
|   | 0310 | 600 | 309 | 2     |        | TYMNET/Protected Access Service Sys. Inter-link   |
|   | 0310 | 600 | 316 | 8     |        | VM/370                                            |
|   | 0310 | 600 | 321 | 4     |        | VM/370                                            |
|   | 0310 | 600 | 322 | 0     |        | VM/370                                            |
|   | 0310 | 600 | 322 | 1     |        | VM/370                                            |
|   | 0310 | 600 | 357 | 2     |        | NORTH AMERICA DATA CENTRE                         |
|   | 0310 | 600 | 360 | 4     |        | VM/370                                            |
|   | 0310 | 600 | 404 | 1     |        | RCA GLOBCOM'S PACKET SWITCHING SERICE             |
| A | 0310 | 600 | 412 | 9     |        | ?                                                 |
| A | 0310 | 600 | 413 | 1     |        | ?                                                 |
|   | 0310 | 600 | 413 | 7     |        | TSO, VM/370                                       |
|   | 0310 | 600 | 416 | 300   |        | Oakridge, Tennessee                               |
|   | 0310 | 600 | 417 | 4     |        | VM/370                                            |
|   | 0310 | 600 | 420 | 6     |        | MAINSTREAMS                                       |
|   | 0310 | 600 | 423 | 500   |        | Oakridge, Tennessee                               |
| B | 0310 | 600 | 430 | 5     |        | BIOVAX                                            |
|   | 0310 | 600 | 434 | 1     |        | (Host) 2 - VM/370, T - VM/370,1,3,4,A,C,E,Z       |
| A | 0310 | 600 | 436 | 5     |        | Toxnet (NLM=National Lib. of Medicine's)          |
| B | 0310 | 600 | 455 | 5     |        | VAX                                               |
|   | 0310 | 600 | 459 | 97    |        |                                                   |
|   | 0310 | 600 | 474 | 3     |        | TYMNET Info Service                               |
| X | 0310 | 600 | 502 | 0     |        | Outdial Fairfax                                   |
|   | 0310 | 600 | 522 | 9     |        | Uni.of Pencilvania School of Arts and Science     |
|   | 0310 | 600 | 526 | 7     |        | CHANEL 01                                         |
| X | 0310 | 600 | 531 | 7     |        | Outdial St.Louis                                  |
| B | 0310 | 600 | 532 | 0     |        | DEC Soft. Serv.                                   |
|   | 0310 | 600 | 556 | 9     |        | STRATUS/32                                        |
|   | 0310 | 600 | 557 | 1     |        | STRATUS/32                                        |



|   |      |     |     |           |           |                                                |
|---|------|-----|-----|-----------|-----------|------------------------------------------------|
|   | 0310 | 600 | 560 | 3         |           | (Host) systems 1,2,3,4,5,C (5=Outdial)         |
| B | 0310 | 600 | 562 | 200       | FNAL      | Fermilab                                       |
| B | 0310 | 600 | 562 | 226       |           | Fermilab 2                                     |
| B | 0310 | 600 | 578 | 78        |           | BIX                                            |
| B | 0310 | 600 | 584 | 401       |           | Washington Post                                |
| B | 0310 | 600 | 61  |           | DIALOG1   | Lockheed Info Systems                          |
|   | 0310 | 600 | 61* | DSDDIPSSL | ORBIT2    | SDC Search Service                             |
|   | 0310 | 600 | 628 | 1         |           | EDCS                                           |
|   | 0310 | 600 | 628 | 3         |           | EDCS                                           |
|   | 0310 | 600 | 643 | 2         |           | EASYLINK                                       |
|   | 0310 | 600 | 643 | 4         |           | EASYLINK                                       |
|   | 0310 | 600 | 672 | 2         |           | International Network                          |
|   | 0310 | 600 | 68  |           |           | Stanford SUMEX-AIM. Tenex op syst.             |
|   | 0310 | 600 | 683 | 2         |           | A&A DATANET (Systems 1,8,0,14)                 |
| X | 0310 | 600 | 701 | 7         |           | Outdial NY                                     |
|   | 0310 | 600 | 759 | 6         |           | (Host) A - VM/370, B - VM/370                  |
| ? | 0310 | 600 | 787 |           |           | Dallas                                         |
|   | 0310 | 601 | 79  |           |           | Berkley Univ.                                  |
|   | 0310 | 602 | 88  |           |           | Stanford Research Institute                    |
| B | 0310 | 611 | 467 |           |           | Cas Online Sys.                                |
|   | 0310 | 614 | 67  |           |           | Ohio CAS (Chemical Abstracts Service)          |
|   | 0310 | 617 | 001 | 38        |           | Multics                                        |
|   | 0310 | 647 | 911 | 065       |           | BIX Lexington Data Service                     |
|   | 0310 | 690 | 006 | 1*D       | DIALOG4   | Lockheed DIALOG service                        |
| B | 0310 | 690 | 080 | 3*D       | DIALOG3   | Lockheed DIALOG service                        |
|   | 0310 | 690 | 762 | 6         |           | Emery ADO                                      |
|   | 0311 | 0   |     |           | TELENET   | USA - Telenet                                  |
| B | 0311 | 002 | 130 | 0039      |           | ECLD                                           |
|   | 0311 | 020 | 100 | 02000     |           | Insco Systems                                  |
|   | 0311 | 020 | 100 | 022       |           | New Jersey Outdial 2400 bps (Area 201)         |
|   | 0311 | 020 | 100 | 02300     |           | American Information Services                  |
|   | 0311 | 020 | 100 | 02400     |           | The Information Bank                           |
|   | 0311 | 020 | 100 | 02500     |           | New Jersey Institute of Technology             |
|   | 0311 | 020 | 100 | 02800     |           | Olcott International Company                   |
|   | 0311 | 020 | 100 | 03700     |           | Informatics Inc                                |
|   | 0311 | 020 | 100 | 169       | MOUTON    |                                                |
|   | 0311 | 020 | 100 | 301       |           | New Jersey Outdial 1200 bps (Area 201)         |
|   | 0311 | 020 | 101 | 59200     |           | Scientific Process & Research Inc              |
|   | 0311 | 020 | 200 | 02100     |           | Scientific Timesharing                         |
|   | 0311 | 020 | 200 | 02200     |           | Scientific Timesharing                         |
| X | 0311 | 020 | 200 | 066       |           | Air Force                                      |
| T | 0311 | 020 | 200 | 099       | ICIB      | Information Council Incorporated B system      |
|   | 0311 | 020 | 200 | 1         | TELEMAIL  | US Telemail facility                           |
| X | 0311 | 020 | 200 | 10900     | CIS       | Chemical Information Systems                   |
| A | 0311 | 020 | 200 | 115       |           | Outdial 300 bps (Area 202)                     |
| A | 0311 | 020 | 200 | 116       |           | Outdial 1200 bps (Area 202)                    |
|   | 0311 | 020 | 200 | 117       |           | Distr. of Columbia Outdial 2400 bps (Area 202) |
| B | 0311 | 020 | 200 | 141       | TELEMAIL  | US Telemail facility (GT-Net)                  |
|   | 0311 | 020 | 200 | 14175     | TELEENQ   | Telenet Enquiry Service                        |
|   | 0311 | 020 | 200 | 14175     | TELEMAIL1 | US Telemail facility                           |
|   | 0311 | 020 | 200 | 14275     | TELENET   | US Telenet                                     |
|   | 0311 | 020 | 201 | 19500     |           | Gallaude College Computer Centre               |
|   | 0311 | 020 | 300 | 06400     |           | NCSS Bureau                                    |
|   | 0311 | 020 | 300 | 130       |           | Connecticut Outdial 1200 bps (Area 203)        |
|   | 0311 | 020 | 301 | 78900     |           | Yale University Computer Centre                |
|   | 0311 | 020 | 400 | 02900     | WATERLO   | University of Waterloo                         |
|   | 0311 | 020 | 600 | 019       |           | Washington Outdial 1200 bps (Area 206)         |
|   | 0311 | 021 | 200 | 02000     |           | Bowne Timesharing                              |
|   | 0311 | 021 | 200 | 02500     |           | Interactive Market Systems (Anistics)          |
|   | 0311 | 021 | 200 | 02800     |           | Burroughs Corp (NYC data centre)               |
|   | 0311 | 021 | 200 | 141       | JPLM1     | Jet Propulsion Laboratory mail 1, USA          |
|   | 0311 | 021 | 200 | 142       | JPLM2     | Jet Propulsion Laboratory mail 2, USA          |

|   |      |     |     |         |          |                                                |
|---|------|-----|-----|---------|----------|------------------------------------------------|
|   | 0311 | 021 | 200 | 14200   |          | GT-Net Telemail                                |
| A | 0311 | 021 | 200 | 315     |          | Outdial 300 bps (Area 212)                     |
| A | 0311 | 021 | 200 | 316     |          | Outdial 1200 bps (Area 212)                    |
| D | 0311 | 021 | 200 | 412     |          | Outdial 2400 bps (Area 212)                    |
| D | 0311 | 021 | 200 | 41200   |          | New York City Outdial (Area 212)               |
|   | 0311 | 021 | 201 | 39200   |          | Memorial Dose Distribution Computation Service |
|   | 0311 | 021 | 201 | 40600   |          | MAV Systems (300 bps)                          |
|   | 0311 | 021 | 201 | 57800   |          | IP Sharp Associates                            |
|   | 0311 | 021 | 201 | 58000   |          | SDL International (1200 bps)                   |
|   | 0311 | 021 | 201 | 58500   |          | SDL International (300 bps)                    |
|   | 0311 | 021 | 201 | 58800   |          | DSL Systems Inc                                |
|   | 0311 | 021 | 201 | 59500   |          | SDL International (1200 bps)                   |
|   | 0311 | 021 | 201 | 62000   |          | Telestat System Inc                            |
|   | 0311 | 021 | 201 | 62700   |          | Telestat Systems Inc                           |
|   | 0311 | 021 | 300 | 02200   |          | Interactive Systems Corporation                |
|   | 0311 | 021 | 300 | 02700   |          | Mellonics Information Centre                   |
|   | 0311 | 021 | 300 | 029     |          | TRW Defence & Space Systems Group              |
| B | 0311 | 021 | 300 | 03300   | ORBIT    | Orbit                                          |
|   | 0311 | 021 | 300 | 03300*D | ORBIT    | SDC Search Service (300 bps)                   |
|   | 0311 | 021 | 300 | 04400   |          | SDC Search Service (1200 bps)                  |
| B | 0311 | 021 | 300 | 039     | USCAL2   | Univ. of Southern California                   |
|   | 0311 | 021 | 300 | 04114   | IHW      | IHW                                            |
|   | 0311 | 021 | 300 | 04700   |          | University of Southern California              |
| B | 0311 | 021 | 300 | 048     | USCAL1   | University of Southern California              |
| B | 0311 | 021 | 300 | 170     |          | LRS Dialog 2                                   |
| T | 0311 | 021 | 300 | 17000   | DIALOG5  | Lockheed Info Systems                          |
|   | 0311 | 021 | 300 | 17000*D | DIALOG2  | Lockheed DIALOG service                        |
| B | 0311 | 021 | 300 | 219     | CALTECH  | Caltech VAX 11/780                             |
|   | 0311 | 021 | 300 | 21908   | CALTECH  | Caltech VAX 11/780                             |
|   | 0311 | 021 | 300 | 21909   | CALTECH2 | Caltech VAX 11/780                             |
|   | 0311 | 021 | 300 | 412     |          | California Outdial 1200 bps (Area 213)         |
| A | 0311 | 021 | 300 | 413     |          | Outdial CA                                     |
|   | 0311 | 021 | 300 | 668     |          | Adainfo                                        |
|   | 0311 | 021 | 301 | 353     | UCLA     | UCLA, USA                                      |
|   | 0311 | 021 | 301 | 40300   |          | Marshall & Swift Publication                   |
|   | 0311 | 021 | 400 | 117     |          | Outdial 300 bps (Area 214)                     |
| A | 0311 | 021 | 400 | 118     |          | Texas Outdial 1200 bps (Area 214)              |
|   | 0311 | 021 | 500 | 022     |          | Pennsylvania Outdial 2400 bps (Area 215)       |
|   | 0311 | 021 | 500 | 112     |          | Pennsylvania Outdial 1200 bps (Area 215)       |
| A | 0311 | 021 | 600 | 020     |          | Outdial 300 bps (Area 216)                     |
| A | 0311 | 021 | 600 | 021     |          | Ohio Outdial 1200 bps (Area 216)               |
|   | 0311 | 021 | 700 | 021     |          | University of Illinois - Urbana                |
|   | 0311 | 030 | 100 | 02000   | NLM      | National Library of Medicine                   |
| A | 0311 | 030 | 100 | 02400   |          | The Source                                     |
| B | 0311 | 030 | 100 | 038     |          | The Source (ID BSC131 SR3811)                  |
| B | 0311 | 030 | 100 | 243     |          | ITT Dialcom                                    |
|   | 0311 | 030 | 100 | 364     |          | Primesoft                                      |
| A | 0311 | 030 | 100 | 38      |          | The Source                                     |
| B | 0311 | 030 | 100 | 633     |          | Toxnet (NLM)                                   |
|   | 0311 | 030 | 101 | 26500   |          | Informatics Inc                                |
|   | 0311 | 030 | 300 | 02000   |          | Computer Sharing Services                      |
|   | 0311 | 030 | 300 | 021     |          | Colorado Outdial 2400 bps (Area 303)           |
|   | 0311 | 030 | 300 | 02300   |          | Broker Services Inc                            |
|   | 0311 | 030 | 300 | 115     |          | Colorado Outdial 1200 bps (Area 303)           |
|   | 0311 | 030 | 301 | 13100   |          | EDI Computer Services                          |
|   | 0311 | 030 | 301 | 13200   |          | EDI Computer Services                          |
|   | 0311 | 030 | 301 | 13300   |          | Energy Enterprises                             |
|   | 0311 | 030 | 500 | 121     |          | Florida Outdial 1200 bps (Area 305)            |
|   | 0311 | 030 | 501 | 16300   |          | Florida Computer Inc                           |
| D | 0311 | 030 | 508 | 793     |          | Miami Outdial (Area 305) ?                     |
|   | 0311 | 031 | 200 | 02200   |          | National Computer Network of Chicago           |
|   | 0311 | 031 | 200 | 024     |          | Illinois Outdial 2400 bps (Area 217 ?)         |

|   |      |     |     |         |          |                                                  |
|---|------|-----|-----|---------|----------|--------------------------------------------------|
|   | 0311 | 031 | 200 | 03100   |          | Continental Bank                                 |
|   | 0311 | 031 | 200 | 03200   |          | Continental Bank                                 |
|   | 0311 | 031 | 200 | 04900   |          | American Hospital Supply Corporation             |
|   | 0311 | 031 | 200 | 411     |          | Illinois Outdial 1200 bps (Area 217 ?)           |
|   | 0311 | 031 | 201 | 07300   |          | Commodity Information Services                   |
|   | 0311 | 031 | 268 | 801     | ADPUSA   | ADP Network Services Ltd.                        |
|   | 0311 | 031 | 300 | 024     |          | Michigan Outdial 2400 bps (Area 313)             |
|   | 0311 | 031 | 300 | 04000   |          | ADP Network Services                             |
|   | 0311 | 031 | 300 | 06200   |          | Merit International (MIT)                        |
|   | 0311 | 031 | 300 | 216     |          | Michigan Outdial 1200 bps (Area 313)             |
|   | 0311 | 031 | 301 | 39800   |          | Merit Computer                                   |
|   | 0311 | 031 | 400 | 07200   |          | Environmental DataNetwork Inc.                   |
|   | 0311 | 031 | 401 | 06500   |          | McDonnell Douglas Automation (300 bps)           |
|   | 0311 | 031 | 401 | 06600   |          | McDonnell Douglas Automation (110 bps)           |
|   | 0311 | 031 | 401 | 06700   |          | McDonnell Douglas Automation (1200 bps)          |
|   | 0311 | 031 | 401 | 61000   |          | McDonnell Douglas Automation (300 bps)           |
|   | 0311 | 031 | 500 | 02000   |          | Bibliographic Retrieval Services                 |
| A | 0311 | 040 | 100 | 612     |          | Modemcity                                        |
| A | 0311 | 040 | 400 | 114     |          | Georgia Outdial 1200 bps (Area 404)              |
| A | 0311 | 040 | 800 | 021     |          | California Outdial 1200 bps? (Area 408)          |
|   | 0311 | 040 | 800 | 245     |          | Bridge                                           |
| B | 0311 | 040 | 800 | 246     |          | SCF                                              |
|   | 0311 | 041 | 201 | 4600    |          | On-Line Systems Inc                              |
|   | 0311 | 041 | 400 | 02000   |          | A.O. Smith Data Systems Divisions                |
|   | 0311 | 041 | 400 | 021     |          | Wisconsin Outdial 1200 bps (Area 414)            |
| B | 0311 | 041 | 500 | 020     |          | LRS-Dialog 2                                     |
| A | 0311 | 041 | 500 | 02000   | DIALOG   | Lockheed Information Systems                     |
|   | 0311 | 041 | 500 | 02000*D | DIALOG   | Lockheed DIALOG service                          |
| B | 0311 | 041 | 500 | 048     |          | LRS Dialog 2                                     |
|   | 0311 | 041 | 500 | 04800   | DIALOG2  | Lockheed Information Systems 2                   |
|   | 0311 | 041 | 500 | 04800*D | DIALOG1  | Lockheed DIALOG service                          |
|   | 0311 | 041 | 500 | 117     |          | California Outdial 1200 bps (Area 415)           |
| I | 0311 | 041 | 500 | 210     |          | Outdial USA                                      |
| A | 0311 | 041 | 500 | 215     |          | Outdial (Area 415)                               |
| A | 0311 | 041 | 500 | 217     |          | Outdial (Area 415)                               |
| A | 0311 | 041 | 500 | 220     |          | Outdial 1200 bps (Area 415)                      |
|   | 0311 | 041 | 500 | 48000   |          | Lockheed Information Systems (?)                 |
| B | 0311 | 041 | 500 | 607     |          | BIONET                                           |
| B | 0311 | 041 | 500 | 609     |          | INTELLIGENETICS                                  |
|   | 0311 | 041 | 501 | 23600   |          | Hydrocomp Inc (300 bps)                          |
|   | 0311 | 041 | 501 | 23700   |          | Hydrocomp Inc (1200 bps)                         |
|   | 0311 | 041 | 501 | 26800   |          | ITEL Corp (300 bps)                              |
|   | 0311 | 041 | 501 | 26900   |          | ITEL Corp (1200 bps)                             |
|   | 0311 | 041 | 501 | 59700   |          | Stanford Library Centre for Inform<br>Processing |
|   | 0311 | 041 | 501 | 59700   |          | Standard Centre for Information Processing       |
| O | 0311 | 050 | 006 | 1       |          | Nuclear Research                                 |
| A | 0311 | 050 | 300 | 020     |          | Outdial 300 bps (Area 503)                       |
| A | 0311 | 050 | 300 | 021     |          | Oregon Outdial 1200 bps (Area 503)               |
| B | 0311 | 050 | 500 | 060     |          | ICN (=LASL)                                      |
| B | 0311 | 051 | 300 | 03000   |          | Mead Data Central                                |
|   | 0311 | 051 | 501 | 39600   |          | State University of New York                     |
|   | 0311 | 051 | 600 | 02200   |          | Timesharing Resources                            |
| D | 0311 | 060 | 200 | 020     |          | Outdial 300 bps (Area 602)                       |
| D | 0311 | 060 | 200 | 021     |          | Outdial 1200 bps (Area 602)                      |
| B | 0311 | 060 | 200 | 150     |          | Phoenix                                          |
|   | 0311 | 060 | 201 | 60900   |          | Timesharing Associates                           |
| B | 0311 | 060 | 300 | 020     |          | Dartmouth College                                |
|   | 0311 | 060 | 300 | 02000   | DARTMTH  | Dartmouth College, USA                           |
|   | 0311 | 060 | 300 | 05000   |          | Corporate Timesharing                            |
|   | 0311 | 060 | 301 | 54700   |          | Raytheon Company Scientific Computer<br>Service  |
| X | 0311 | 060 | 700 | 02000   | CORNELL0 | Cornell University (134.5 bps)                   |

|   |      |     |     |       |          |                                                |
|---|------|-----|-----|-------|----------|------------------------------------------------|
| T | 0311 | 060 | 700 | 02100 | CORNELL1 | Cornell University (300 bps)                   |
| T | 0311 | 060 | 700 | 02200 | CORNELL2 | Cornell University (1200 bps)                  |
|   | 0311 | 060 | 700 | 02300 | CORNELL3 | Cornell University (1200 bps)                  |
|   | 0311 | 060 | 700 | 03600 |          | TIPO Computer                                  |
|   | 0311 | 060 | 702 | 00    | CORNELL2 | Cornell University                             |
|   | 0311 | 060 | 702 | 00    | CORNELL2 | Cornell University                             |
|   | 0311 | 060 | 800 | 02500 |          | University of Wisconsin                        |
|   | 0311 | 060 | 801 | 6630  |          | University of Wisconsin                        |
|   | 0311 | 060 | 900 | 4200  |          | Dow-Jones                                      |
|   | 0311 | 061 | 200 | 02500 |          | Honeywell Inform Services Datanetwork          |
|   | 0311 | 061 | 200 | 02700 |          | Honeywell Inform Services Datanetwork          |
|   | 0311 | 061 | 200 | 121   |          | Minnesota Outdial 1200 bps (Area 612)          |
|   | 0311 | 061 | 201 | 06500 |          | Honeywell Inform Services Datanetwork, 300 bps |
|   | 0311 | 061 | 201 | 06500 |          | Honeywell Inform Services Datanetwork          |
|   | 0311 | 061 | 201 | 06600 |          | Honeywell Inform Services Datanetwork, 110 bps |
|   | 0311 | 061 | 201 | 06700 |          | Honeywell Inform Services Datanetwork, 300 bps |
|   | 0311 | 061 | 201 | 06900 |          | Honeywell Inform Services Datanetwork, 134 bps |
| B | 0311 | 061 | 400 | 021   |          | CAS online                                     |
| D | 0311 | 061 | 400 | 02124 | CASUSA   | STN International                              |
|   | 0311 | 061 | 700 | 02000 |          | Bolt Beranek & Newman                          |
|   | 0311 | 061 | 700 | 02300 |          | Computer Corporation of America                |
|   | 0311 | 061 | 700 | 02400 |          | AVCO Computer Services                         |
|   | 0311 | 061 | 700 | 03600 |          | Data Resources Inc                             |
|   | 0311 | 061 | 700 | 03800 |          | BBN-RCC                                        |
|   | 0311 | 061 | 700 | 03800 |          | Bolt Beranek & Newman                          |
|   | 0311 | 061 | 700 | 06700 |          | Management Decision Systems Inc                |
|   | 0311 | 061 | 700 | 07000 |          | Interactive Science Corp                       |
|   | 0311 | 061 | 700 | 07600 |          | Interactive Science Corp                       |
|   | 0311 | 061 | 700 | 08000 |          | III Systems Inc                                |
| B | 0311 | 061 | 700 | 08401 |          | LCG                                            |
|   | 0311 | 061 | 700 | 12000 |          | Cullinane Corp                                 |
|   | 0311 | 061 | 700 | 13700 |          | Masachusetts Institute of Technology           |
|   | 0311 | 061 | 700 | 13800 |          | Masachusetts Institute of Technology           |
|   | 0311 | 061 | 700 | 13900 |          | Masachusetts Institute of Technology           |
|   | 0311 | 061 | 700 | 14000 |          | Masachusetts Institute of Technology           |
| B | 0311 | 061 | 700 | 270   |          | Waltham                                        |
| B | 0311 | 061 | 700 | 609   |          | Package                                        |
| B | 0311 | 061 | 700 | 613   |          | BBN10                                          |
| B | 0311 | 061 | 700 | 614   |          | BBNVAX                                         |
|   | 0311 | 061 | 701 | 01600 |          | Data Resources Inc (300 bps)                   |
|   | 0311 | 061 | 701 | 01900 |          | Data Resources Inc (300 bps)                   |
|   | 0311 | 061 | 701 | 16100 |          | First Data Division/ADP Inc                    |
|   | 0311 | 061 | 701 | 16200 |          | First Data Division/ADP Inc                    |
|   | 0311 | 061 | 701 | 25800 |          | Data Resources Inc (134.5 bps)                 |
|   | 0311 | 061 | 701 | 26900 |          | Interactive Management Systems                 |
|   | 0311 | 061 | 701 | 27500 |          | Masachusetts Institute of Technology           |
|   | 0311 | 061 | 701 | 39000 |          | Masachusetts Institute of Technology           |
|   | 0311 | 061 | 701 | 40300 |          | Masachusetts Institute of Technology           |
|   | 0311 | 061 | 703 | 088   |          | Delphi                                         |
|   | 0311 | 061 | 900 | 050   |          | California Outdial 1200 bps (Area 619)         |
|   | 0311 | 070 | 300 | 02000 |          | Litton Computer Services                       |
|   | 0311 | 070 | 300 | 02100 |          | American Management Systems                    |
|   | 0311 | 070 | 300 | 056   |          | PRC Computer Centre Inc                        |
|   | 0311 | 070 | 300 | 117   |          | Virginia Outdial 2400 bps (Area 703)           |
| B | 0311 | 070 | 300 | 50000 |          | NIH-EPA (CIS)                                  |
|   | 0311 | 070 | 305 | 05200 |          | Digital Broadcasting Corporation               |
|   | 0311 | 071 | 300 | 024   |          | Texas Outdial 2400 bps (Area 713)              |
|   | 0311 | 071 | 300 | 114   |          | Texas Outdial 1200 bps (Area 713)              |
|   | 0311 | 071 | 301 | 08300 |          | Corporate Services Inc                         |

|   |      |     |     |       |         |                                         |
|---|------|-----|-----|-------|---------|-----------------------------------------|
|   | 0311 | 071 | 301 | 56500 |         | Rice University                         |
|   | 0311 | 071 | 400 | 02000 | SCIAPP  | Science Applications Inc.               |
|   | 0311 | 071 | 401 | 13700 |         | Engineering Supervision Co              |
|   | 0311 | 071 | 700 | 02000 |         | Brodart Inc                             |
| A | 0311 | 080 | 100 | 020   |         | Outdial 300 bps (Area 801)              |
| A | 0311 | 080 | 100 | 021   |         | Utah Outdial 1200 bps (Area 801)        |
| B | 0311 | 080 | 100 | 054   |         | ES                                      |
|   | 0311 | 080 | 101 | 13700 |         | Environmentech Information Systems      |
|   | 0311 | 080 | 400 | 02000 |         | Multiple Access Computer Group          |
| X | 0311 | 080 | 800 | 01046 | UKIRTUK | Infra Red Telescope in Hawaii           |
| X | 0311 | 080 | 800 | 040   | UKIRT   | UK Infra Red Telescope in Hawaii        |
| A | 0311 | 081 | 300 | 020   |         | Outdial 300 bps (Area 813)              |
| A | 0311 | 081 | 300 | 021   |         | Florida Outdial 1200 bps (Area 813)     |
| D | 0311 | 081 | 305 | 518   |         | Tampa Outdial (Area 813) ?              |
|   | 0311 | 081 | 800 | 021   |         | California Outdial 1200 bps (Area 818)  |
| D | 0311 | 090 | 900 | 80000 | JPLM3   | Jet Propulsion Laboratory mail 2, USA   |
|   | 0311 | 090 | 900 | 8100  |         | Telemail                                |
|   | 0311 | 091 | 400 | 02200 |         | Electronic Tabulating Corporation       |
|   | 0311 | 091 | 600 | 050   |         | California Outdial 1200 bps (Area 916)  |
| A | 0311 | 091 | 900 | 020   |         | Outdial 300 bps (Area 919)              |
| A | 0311 | 091 | 900 | 021   |         | Outdial 1200 bps (Area 919)             |
|   | 0311 | 3   |     |       | RCA     | USA - RCA (RCAG)                        |
|   | 0311 | 9   |     |       |         | USA - TRT                               |
|   | 0312 | 4   |     |       |         | USA - FTCC                              |
|   | 0312 | 5   |     |       |         | USA - Uninet                            |
|   | 0312 | 521 | 210 | 1     | DIALOG6 | Lockheed Info Systems                   |
| D | 0312 | 561 | 703 | 080   |         | UNINET                                  |
| B | 0312 | 561 | 703 | 088   |         | Delphi                                  |
|   | 0312 | 6   |     |       | AUTONET | USA - Autonet                           |
|   | 0312 | 688 | 01  |       | AUTONET | AUTONET Information                     |
|   | 0312 | 7   |     |       |         | USA - Telenet                           |
|   | 0313 | 2   |     |       | COMPU   | USA - Compuserve                        |
|   | 0313 | 6   |     |       |         | USA - Geisco                            |
|   | 0334 |     |     |       |         | Mexico                                  |
|   | 0334 | 0   |     |       |         | Telepac                                 |
|   | 0340 |     |     |       | FA      | French Antilles (Martinique (Curacau?)) |
|   | 0340 | 0   |     |       |         | Dompac/NTI                              |
|   | 0342 |     |     |       | BDS     | Barbados                                |
|   | 0342 | 235 | 191 | 9169  |         |                                         |
|   | 0350 |     |     |       |         | Bermuda                                 |
|   | 0350 | 3   |     |       |         | PSDS                                    |
|   | 0425 |     |     |       | IL      | Israel                                  |
|   | 0425 | 1   |     |       |         | Isranet                                 |
| B | 0425 | 130 | 000 | 215   |         | Israelbox                               |
|   | 0426 |     |     |       | BRN     | Bahrain                                 |
|   | 0426 | 3   |     |       |         | BTC                                     |
|   | 0431 |     |     |       | DXB     | United Arab Emirates - Dubai            |
|   | 0440 |     |     |       | J       | Japan                                   |
|   | 0440 | 1   |     |       |         | DDX-P                                   |
| B | 0440 | 129 | 431 | 04    |         | KEK VAX                                 |
| B | 0440 | 129 | 431 | 21    |         | Tsukuba Uni                             |
|   | 0440 | 8   |     |       | VENUSP  | Venus-P (Japanese data network)         |
| I | 0440 | 820 | 023 |       |         | KDD ?                                   |
| B | 0440 | 820 | 060 | 01    | KDD     | KDD Test Host, TOKYO                    |
|   | 0442 |     |     |       |         |                                         |
| B | 0442 | 110 | 403 | 25    |         | OKI                                     |
| B | 0442 | 433 | 403 | 07    |         | CMES                                    |
|   | 0450 |     |     |       |         | South Korea                             |
|   | 0450 | 1   |     |       |         | Dacom/DNS                               |
|   | 0454 |     |     |       | HK      | Hong Kong                               |
|   | 0454 | 2   |     |       |         | Intelpak                                |
|   | 0454 | 5   |     |       |         | Datapak                                 |
| A | 0454 | 550 | 010 | 4     | HKDATA  | Hong Kong DATAPAK Info                  |

|   |      |     |     |      |         |                                         |
|---|------|-----|-----|------|---------|-----------------------------------------|
| A | 0454 | 550 | 043 | 1    |         | DATAFAX                                 |
|   | 0487 |     |     |      |         | Taiwan                                  |
|   | 0487 | 2   |     |      |         | Pacnet                                  |
|   | 0487 | 7   |     |      |         | Udas                                    |
|   | 0505 |     |     |      | AUS     | Australia                               |
|   | 0505 | 2   |     |      |         | Austpac                                 |
|   | 0505 | 228 | 621 | 000  |         | Anglo/Australian Observatory            |
|   | 0505 | 228 | 621 | 001  |         | CSIRO Radio-Physics                     |
|   | 0505 | 228 | 621 | 001  |         | FTP for Epping                          |
|   | 0505 | 233 | 422 | 000  | MELBUNI | Melbourne Univ. Australia               |
| A | 0505 | 273 | 720 | 000  | UQ      | Univ. of Queensland Australia           |
| A | 0505 | 273 | 720 | 000  | UQXA    | University of Queensland ANF-10 gateway |
| D | 0505 | 273 | 722 | 0000 |         | Uni Queensland                          |
|   | 0505 | 282 | 620 | 000  |         | FTP For Austek                          |
| A | 0505 | 282 | 620 | 000  |         | VAX in Sidney, Australia                |
|   | 0505 | 3   |     |      |         | Midas                                   |
|   | 0505 | 321 | 000 | 1    |         | Network test                            |
|   | 0505 | 321 | 000 | 3    |         | MIDAS FOX Test                          |
|   | 0510 |     |     |      |         | Indonesia                               |
|   | 0510 | 1   |     |      |         | PSDS (1986)                             |
|   | 0525 |     |     |      | SGP     | Singapore                               |
|   | 0525 | 2   |     |      |         | Telepac                                 |
| A | 0525 | 211 | 668 | 8    | TELEPAC | Telepac Info                            |
|   | 0530 |     |     |      | NZ      | New Zealand                             |
|   | 0530 | 1   |     |      |         | P.S.S. (Pacnet)                         |
|   | 0530 | 171 | 000 | 004  | WAIKATO | Univ of Waikato New Zealand             |
| B | 0530 | 197 | 000 | 016  |         | ASMAIL                                  |
|   | 0547 |     |     |      |         | Fr.Polyn.                               |
|   | 0547 | 0   |     |      |         | Tompac                                  |
|   | 0612 |     |     |      |         | Ivory Coast                             |
|   | 0612 | 2   |     |      |         | Sytranpac                               |
|   | 0647 |     |     |      |         | Reunion                                 |
|   | 0647 | 0   |     |      |         | Dompac/NIT                              |
|   | 0655 |     |     |      | ZA      | South Africe                            |
|   | 0655 | 0   |     |      |         | Saponet                                 |
| D | 0655 | 011 | 101 | 207  |         | UNI-NET                                 |
|   | 0714 |     |     |      |         | Panama                                  |
|   | 0714 | 1   |     |      |         | Intelpac                                |
|   | 0722 |     |     |      |         | Argentina                               |
|   | 0722 | 2   |     |      |         | Arpac                                   |
| I | 0722 | 221 | 110 | 0171 |         |                                         |
|   | 0724 |     |     |      | BR      | Brazil                                  |
|   | 0724 | 0   |     |      |         | Interdata                               |
|   | 0724 | 1   |     |      |         | Renpac                                  |
| D | 0724 | 782 | 450 | 8    |         | Nuclear Research Institute              |
|   | 0730 |     |     |      |         | Chile                                   |
|   | 0730 | 0   |     |      |         | Entel                                   |
|   | 0732 |     |     |      |         | Colombia                                |
|   | 0732 | 0   |     |      |         |                                         |
|   | 0742 |     |     |      |         | French Guiana                           |
|   | 0742 | 0   |     |      |         | Dompac/NTI                              |
|   | 0900 |     |     |      |         | USA ?                                   |
|   | 0900 | 0   |     |      |         | Dialnet                                 |

=====

|  
| Local addresses on KOMETH (0228 479 110 86):  
|

|  |     |                    |          |                      |                 |  |
|--|-----|--------------------|----------|----------------------|-----------------|--|
|  | 11  | KOMETH-Information |          |                      |                 |  |
|  | 120 | Modems             | 1200 bps | (predefined numbers, | some with a PW) |  |
|  | 124 | Modems             | 2400 bps | (                    | " " , " " a PW) |  |
|  | 130 | Modems             | 300 bps  | (                    | " " , " " a PW) |  |
|  | 1D0 | RZ-VAX (EZRZ1)     |          |                      |                 |  |

```
| 300 ETZ-VAX (CUMULI)
| 520 ETHICS, Library database
| D11 PSI-Information
| C000 Time
| C025 X25 Gateway (RZU, with password)
| C011 NUZ-Information
| C100 RZU, VM/SP, full-screen
```

| There are two information systems on the RZ-VAX:

```
| MAC-BBS BBS with Mac-specific informations. Access for validated users
| only (that means that you have to type in your name, address and
| whether you're a student at the ETH or not and then wait a few
| days).
| (Username=MAC)
| VisInfo Informations server of the VIS (Verein der InformatikStudenten)
| Contains some boards with mail from several networks and from
| local sources. Has a CHAT (closed during prime time hours). Free
| access.
| (Username=VISINFO)
```

=====

| Local addresses at CERN (0228 468 114 0510):

```
| 17 Lyon (own network)
| 23 PAD
| 31 VXOMEG
| 41 Wisconsin/Madison
| 42 CERNLINE 193
| 45 DECserver
| 51 ALEPH
| 56 MERLIN VAX
| 61 (Prompt)
| 72 Wylbur / VM
| 100 Wylbur / VM
| 101 VM/370 CERNVM
| 102 VM/370 CERNVMB
| 103 VM/370 CERNVM
| 110 VXLDB1 VAX 8650 VMS 4.6
| 111 Information
| 112 VXSB
| 115 VXLDB1
| 120 Service CAD_CAM (VAX 8650+VAX785)/SYSTEME=VMS 4.6
| 121 CAD_CAM
| 122 VXCERN
| 123 VXCERN
| 124 BSD
| 125 CERNVM
| 127 PAD
| 130 L3 test beam VXC3
| 137 ALEPH-TPC
| 140 VXEPEL
| 141 DECserver 200 ("user friendly")
| 142 CERNADD
| 146 VXEPEL
| 147 Uni Genf TEC VAXTEC
| 151 CCVAX / DECserver 200
| 152 Uni Genf WA70
| 154 ALEPH 750 Fastbus VAX
| 161 MCR
| 162 MCR
| 166 VXWA80
```

```

167 cernvax
170 VXINFN
175 ALEPH
176 MCR with HELP
X29 X25 Gateway

```

Addresses on Merit (0228 468 114 0583):

The principal host computers on Merit are:

| Name       | System/machine      | Organization          | Location     |
|------------|---------------------|-----------------------|--------------|
| MSUnet-IBM | VM/CMS IBM 3090-180 | Michigan State Univ   | East Lansing |
| OU         | Multics Honeywell   | Oakland Univ          | Rochester    |
| UB         | MTS IBM 3090-400    | Univ of Michigan      | Ann Arbor    |
| UM         | MTS IBM 3090-400    | Univ of Michigan      | Ann Arbor    |
| WM         | DECsystem-10        | Western Michigan Univ | Kalamazoo    |
| WU         | MTS Amdahl 470V/8   | Wayne State Univ      | Detroit      |

If you have a question about the use of the Merit Network, call (313) 764-9423 and ask for a user consultant.

Other host computers and services available on the Merit network:

|                |                 |             |                   |
|----------------|-----------------|-------------|-------------------|
| Autonet        | CMU-Cyber       | CMU-IBM     | Datapac           |
| DIALOUT-AA     | DIAL1200-AA     | DIAL2400-AA | DIAL300-AA        |
| EMU-VAX        | IGW             | ITI         | MAGNET            |
| MSU-CLSI       | MSU-CLVAX1      | MSU-EGRNET  | MSU-IBM           |
| MSU            | MTU             | MTUS5       | OU-SecsNet        |
| RPI            | RUAC            | Survey      | Telenet           |
| UM-Annex       | UM-CIC          | UM-CLINFO   | UM-dippy          |
| UM-DSC         | UM-EnginHarris  | UM-MMVAX    | UM-Public-Service |
| UM-QuickSlides | UM-RAVAX        | UM-zippy    | UMD-LIB           |
| UMLIB          | UMLIB-300       | WAYNEST1    | WAYNEST2          |
| WMU-CAE        | WMU-Kanga       | WMU-Pooh    | WMU-Puff          |
| WMU-Tigger     | WMU-Winnie      | WSU-CSVAX   | WSU-ET            |
| WSUNET         | ZOOnet-KCollege | ZOOnet-KVCC | ZOOnet-Nazareth   |

Some of the other computers and services which can be accessed via Telenet, Autonet, and Datapac:

|                 |                |                |                  |
|-----------------|----------------|----------------|------------------|
| ABA/NET         | ACP            | ADPNS-261      | ADPNS-3          |
| ADPNS-446       | ADPNS-9        | Alberta        | ARTFL            |
| Automail-23     | Automail-297   | Boeing         | British-Columbia |
| BRS             | Cal-Berkeley   | Calgary        | Caltech-HEP      |
| Carnegie-DEC-20 | Carnegie-MICOM | Carnegie-11/45 | CompuServe       |
| Comshare        | Cornell        | Dalhousie      | DatapacInfo      |
| Dialcom         | Dialog         | Dow-Jones      | Guelph           |
| Guelph-Cosy     | Illinois       | Illinois-Cyber | LEXIS            |
| Manitoba        | Maryland-Unix  | McGill         | MGH              |
| Minnesota-Cyber | Minnesota-VAX  | MIT-Multics    | MIT-VM           |
| Montreal        | Natl-Lib-Med   | NCAR-Telenet   | New-Brunswick    |
| Newsnet         | NJIT-EIES      | NLM            | NLM-MCS          |
| Notre-Dame      | NRC            | NYTimes        | OAG              |
| Queens          | Rice           | SDC            | SFU              |

==Phrack Inc.==



## COSMOS

### Computer System for Mainframe Operations

#### Part Two

by King Arthur

This article will present solutions to the computer security problems presented in my previous file. The following are simple but often neglected items which if properly treated can immensely increase your company's computer security. These points apply not merely in regards to COSMOS, but to all computers in all companies.

#### A) Dial-Up Security:

When securing a computer system, regardless of its type, it's important to remember this: the only way someone can remotely access your system is if there is a dial-up line leading to that system. If your system has a dial-up, make sure that you have taken every possible precaution to secure that line. "The one piece of advice I would give is: Be careful with dial-up lines," says Bellcore's Ed Pinnes.

Dave Imparato, Manager of Database Management at New York Telephone, says, "We have devices that sit in front of our computers that you have to gain access to. In order to even get to COSMOS, there are three or four levels of security you have to go through, and that's before you even get to the system."

#### Rules for protection of Dial-Up lines:

1. Have as few dial-up lines as possible. Private lines or direct connections are often a viable replacement for dial-up lines.
2. If you must have phone lines going to your computer, use external hardware, if possible. For instance, the Datakit Virtual Circuit Switch (VCS) will require a user to specify an "access password" and a system destination to specify which system you are calling. The VCS would then connect you to the requested system which would prompt you for a login and password. Using hardware similar to this serves a double purpose:

A) It is harder for someone to get into your computer, due to additional passwords;

B) Employees need only dial a single number to access a number of systems.

Another good type of hardware is a callback modem. A callback modem will prompt users for a login and password. If these are correct, the modem will automatically callback to a predetermined number. At that point you would login to the computer. The advantage of callback is that unless a call is placed from a certain phone, there is no way to connect. Unfortunately, this is not always efficient for systems with large numbers of users.

Lastly, and the most effective means of access, is to have a system which does not identify itself. A caller has to enter a secret password, which doesn't display on the screen. If a caller doesn't type the correct password, the system will hang up, without ever telling the caller what has happened.

3. If you ever detect "hackers" calling a certain number, it is advisable to change that number. Phone numbers should be unlisted. According to a hacker, he once got the number to an AT&T computer by asking directory assistance for the number of AT&T at 976 Main Street.
4. If dial-up lines aren't used on nights or weekends, they should be disabled. Computer hackers usually conduct their "business" on nights or weekends. The COSMOS system has the ability to restrict access by time of day.

#### B) Password Security:

Using the analogy between a computer and a file cabinet, you can compare a password to the lock on your file cabinet. By having accounts with no passwords you are, in effect, leaving your file cabinet wide open. A system's users will often want passwords that are easy to remember. This is not an advisable idea, especially for a database system with many users. The first passwords tried by hackers are the obvious. For instance if MF01 is known to be the user name for the frame room, a hacker might try MF01, FRAME, MDF, or MAINFRAME as passwords. If it's known to a hacker that the supervisor at the MDF is Peter Pinkerton, PETE or PINKERTON would not be very good passwords.

#### Rules for password selection:

1. Passwords should be chosen by system administrators or the like. Users will often choose passwords which provide no security. They should not be within the reach of everybody in the computer room, but instead should be sent via company mail to the proper departments.
2. Passwords should be changed frequently, but on an irregular basis -- every four to seven weeks is advisable. Department supervisors should be notified of password changes via mail, a week in advance. This would ensure that all employees are aware of the change at the proper time. One thing you don't want is mass confusion, where everybody is trying to figure out why they can't access their computers.
3. System administrators' passwords should be changed twice as often because they can allow access to all system resources. If possible, system administrator accounts should be restricted from logging in on a dial-up line.
4. A password should NEVER be the same as the account name. Make sure that ALL system defaults are changed.
5. Your best bet is to make passwords a random series of letters and numbers. For example 3CB06W1, Q9IF0L4, or F4W21D0. All passwords need not be the same length or format. Imperato says, "We built a program in a PC that generates different security passwords for different systems and makes sure there's no duplication."
6. It's important to change passwords whenever an employee leaves the company or even changes departments. Imperato says, "When managers leave our organization, we make sure we change those passwords which are necessary to operate the system."
7. The Unix operating system has a built-in "password aging" feature, which requires a mandatory change of passwords after a period of time. If you run any Unix-based systems, it's important to activate password aging.
8. When you feel you have experienced a problem, change ALL passwords, not just those passwords involved with the incident.

### C) Site security:

There have been a number of articles written by hackers and published in 2600 Magazine dealing with garbage picking or what hackers call "trashing". It's important to keep track of what you throw out. In many companies, proprietary operations manuals are thrown out. COSMOS itself is not a user-friendly system. In other words, without previous exposure to the system it would be very difficult to operate. Bellcore's Beverly Cruse says, "COSMOS is used in so many places around the country, I wouldn't be surprised if they found books... in the garbage, especially after divestiture. One interesting thing about a COSMOS article written by hackers, is that there was a lot of obsolete information, so it shows that wherever the information came from... it was old."

#### Rules for site security:

1. Although it may seem evident, employees should be required to show proper identification when entering terminal rooms or computer facilities. It's doubtful that a hacker would ever attempt to infiltrate any office, but hackers aren't the only people you have to worry about.
2. Urge employees to memorize login sequences. It's a bad idea for passwords to be scribbled on bits of paper taped to terminals. Eventually, one of those scraps may fall into the wrong hands.
3. Garbage should be protected as much as possible. If you use a private pick-up, keep garbage in loading docks, basements, or fenced-off areas. If you put your garbage out for public sanitation department pick-up, it's a good idea to shred sensitive materials.
4. Before throwing out old manuals or books, see if another department could make use of them. The more employees familiar with the system, the less of a chance that there will be a security problem.
5. Printing terminals should be inspected to make sure that passwords are not readable. If passwords are found to echo, check to see if the duplex is correct. Some operating systems allow you to configure dial-ups for printer use.

### D) Employee Security:

When a hacker impersonates an employee, unless he is not successful there is a great chance the incident will go unreported. Even if the hacker doesn't sound like he knows what he's talking about, employees will often excuse the call as an unintelligent or uninformed person. It's unpleasant to have to worry about every call with an unfamiliar voice on the other end of the phone, but it is necessary.

#### Rules for employee security:

1. When making an inter-departmental call, always identify yourself with:  
1) Your name; 2) Your title; and 3) Your department and location.
2. Be suspicious of callers who sound like children, or those who ask you questions that are out of the ordinary. Whenever someone seems suspicious, get their supervisor's name and a callback number. Don't discuss anything sensitive until you can verify their identity. Don't ever discuss passwords over the phone.
3. When there is a security problem with a system, send notices to all users

4. Remind all dial-up users of systems, before hanging up.
5. If security-minded posters are put up around the workplace, employees are bound to take more care in their work and in conversations on the phone.
6. If managers distribute this and other computer security articles to department supervisors employee security will be increased.

Bellcore recently sent a package to all system administrators of COSMOS systems. The package detailed security procedures which applied to COSMOS and Unix-based systems. If you are a recipient of this package, you should re-read it thoroughly to ensure that your systems are secure. Cruse says, "Last year... I had a call from someone within an operating company with a COSMOS security problem. All we really did was give them documentation which reminded them of existing security features... There is built-in security in the COSNIX operating system... We really didn't give them anything new at the time. The features were already there; we gave them the recommendation that they implement all of them."

Computer security is a very delicate subject. Many people try to pretend that there is no such thing as computer crime. Since the problem exists, the best thing to do is to study the problems and figure out the best possible solutions. If more people were to write or report about computer security, it would be easier for everyone else to protect themselves. I would like to see Bellcore publish security guidelines, available to the entire telecommunications industry. Keep in mind, a chain is only as strong as its weakest link.

Volume Three, Issue 27, File 6 of 12

Disclaimer: I take no responsibility for any use or abuse of the information contained in this article, nor for any damage caused by the use of methods described. DECNET, VAX, and VMS are possibly registered trademarks of Digital Equipment Corporation.

There comes a time when every somewhat intelligent programmer asks: Is hacking difficult? Now, being in a university network, why don't just give it a try? Since one is an official student and somewhat authorized to use the computing facilities, testing the modern means of communication should cause no trouble.

Well, you start searching on those nodes, you have official access for interesting programs and procedures. And you find: Netdcl, just one program of many, that obviously enables one to run commands on remote nodes without having an account on these nodes. A really interesting thing, as nearly everything is allowed that a normal user can do.

The dear reader may start to think: Wasn't there always the shouting about VMS being the MOST SECURE computer system, making it UNPENETRABLE to hackers? Ok, cool down, this feature can be disabled and so, you think, if someone has super secret data on his VAX, he will stop any use or abuse of this feature.

2nd Act -- Somewhere one has heard about some mystery things called system calls. Since one always wanted to know about how to react on keystrokes on a VAX (really being not trivial!) you start reading the manuals more precisely to find out how to do it in Pascal.

Randomly on browsing thru the pages you discover functions which deliver information about Userids. This comes in handy, as a friend engaged in university politics wants to distribute a leaflet by email to all registered users. In fact, it's completely unproblematic to gain a list of all users. An example program, although written in Assembler, is even contained in the manuals. Enjoy a list of 1000 Userids complete with information about network access rights. The Pascal program is contained in Appendix B (later in this file).

Sorry, passwords are not stored in this list. Even the Sysop can't access them, so that's no great loss. Guess what passwords many accounts have? Sure, just try the username. It's really amazing how ignorant users can be. Of course this is a problem of group-accounts, that many users have access to and must know the password. Nevertheless, the hole is there.

The real hacker, once he has logged in on such an account surely finds ways to gain system privilege. This requires in-depth knowledge of the Kernel of VMS and is another story I won't deal with.

What is DECNET?

~~~~~

DECNET is the means, by which computers from Digital Equipment Corporation (DEC) can be connected to each other. Each computer in this network has an address which is normally given by x.y where x is the area number (an integer) and y is the node number in this area which ranges from 1 to 1023. To access DECNET nodes, one specifies just one number, which can be computed from x and y by the following formula:

$$\text{nodenumber} = x * 1024 + y$$

Often nodes, especially local nodes (having the same area number as your current node) have names assigned to them so they can be memorized more easily.

Interesting DECNET Commands

~~~~~

To get a (first) list of available DECNET nodes, try the command

\$ SHOW NET

The \$ (as in the following examples) is the default prompt of VMS and should

not be entered. This Command will give you a list of (hopefully) reachable nodes. All lines of the output contain the network address in the form x.y and normally a name which this node is known by.

Your current node is mentioned in the first line in "VAX/VMS network status for local node X.Y Name". In most cases you will then just see local nodes listed and a line saying "The next hop to the nearest area router is node XX.YY". This node contains more information about the DECNET than the node you are currently on. If you have an account on the specified node, log on there and try again. If not, well, play with the local nodes listed and look at the command NCP shown later.

Now, what can you do with those nodes that were mentioned in the output? First command is

```
$ SET HOST <node>
```

Where <node> is either a nodename or a nodenumber (see above). Thus, if SDIVAX was listed in the SHOW NET list as 42.13, then you may try both SET HOST SDIVAX or SET HOST 43021 ( $42 \times 1024 + 13 = 43021$ ). Probably you'll get that ugly Username: prompt. You're on your own then.

Second thing you can do with DECNET is email. On VMS the MAIL program can send mail to other users. If you and your friend both have accounts on the same DECNET, you can send him mail if you know his nodename or nodenumber by specifying SDIVAX::FREDDY or 43021::FREDDY.

Then there is PHONE. This is a utility to talk to another (or several) user(s) on a DECNET. If you want to call Freddy, just type PHONE SDIVAX::FREDDY. If he is logged in, his terminal will ring and if he answers his phone (with PHONE ANSWER) you may chat with him. PHONE has another nice feature built in: You may ask for a list of active users on a remote name by %DIR SDIVAX. See the online help on PHONE for further details.

The next really mighty DECNET facility is remote file access. Valid filenames in VMS consist of the components node, disk, directory and filename. An example for a valid filename is SDIVAX::DISK\$2:[NASA.SECRET]SDI.DOC where some components may be omitted and default values are used instead.

File names including the node specification may be used in nearly all VMS commands examples being DIR, TYPE and COPY. Access to the specified file is granted, if the protection of the file allows access by world, or if the owner of the file is the user DECNET. This pseudo userid is available on every VAX and has the password DECNET. Access to that account is limited to network processing so you can't just log in with Username=DECNET, password=DECNET. By default a special directory owned by the User DECNET exists on each node. This directory can be accessed by just specifying the nodename without any disk or directory information, as in

```
$ DIR SDIVAX::
```

If users played too much with this feature, the directory may be protected or otherwise disabled.

The last feature described here is the remote command processing facility. If you try to open a file with the specification

```
$ SDIVAX::"task=foo.com"
```

Instead of opening the DCL procedure, foo.com will be executed. To make use of this feature easily, programs have been written to interactively communicate with a remote host. The command procedure NETDCL.COM does this task and is contained in the Appendix A (seen later in this file. Look at this

DCL-Procedure to learn more about DECNET features.

### The Key To Universal Knowledge

~~~~~

There is a pearl under the programs on a VAX. It's called NCP and will give readily information about the whole DECNET. You start this program either by MCR NCP or by doing a SET DEF SYS\$SYSTEM and RUN NCP. Use the on-line Help provided in NCP (which means Network Control Program) to learn more.

NCP> SHOW KNOWN NODES

Provides a list of all nodes known on your current node, including the names you may use as node specifications. But there is more: You may connect to another node's database and get a list of nodes which are known at the remote node with

NCP> SET EXEC SDIVAX

And then again the SHOW KNOWN NODES command. This feature should provide you with a nearly infinite list of node names and node numbers.

### Conclusion

~~~~~

There are many nice features available under DECNET. Probably I don't know all, but I hope this article showed you the mighty tools available on VMS to make network life easier.

WARNING: The author has had bad experiences with some node administrators, who didn't like their machines being contacted over DECNET. Yes, that's the drawback, each DECNET activity is written to a protocol file that is printed and deleted every month. So you should be careful in using DECNET.

- - - - -

### APPENDIX A:

The Procedure NETDCL.COM, sometimes called TELL.COM, NET.COM

-----

```
$ IF f$mode() .EQS. "NETWORK" THEN GOTO network
$ IF p1 .EQS. "" THEN READ/PROMPT="_Node: " sys$command p1
$ nodespec = p1 - "::"
$ nodename = f$extract(0,f$locate("","",nodespec),nodespec)
$! include the following line for "hard cases"
$! nodespec = nodespec+"decnet decnet"
$ ON WARNING THEN CONTINUE
$ CLOSE/ERR=open_server dcl_server
$open_server:
$ OPEN/READ/WRITE dcl_server 'nodespec'::"TASK=NETDCL"/ERROR=open_failure
$ ON WARNING THEN GOTO exit
$flush_output:
$ READ dcl_server record
$ IF record .EQS. "SEND_ME_A_COMMAND" -
 THEN GOTO send_command
$ WRITE sys$output record
$ GOTO flush_output
$send_command:
$ IF p2 .NES. "" THEN GOTO single_command
$ READ sys$command record /PROMPT="'"nodename'> " /END=exit
$ record := 'record
$ IF record .EQS. "EXIT" THEN GOTO exit
```

```

$ WRITE dcl_server record
$ GOTO flush_output
$single_command:
$ command := 'p2' 'p3' 'p4' 'p5' 'p6' 'p7' 'p8'
$ WRITE dcl_server command
$single_flush:
$ READ dcl_server record
$ IF record .EQS. "SEND_ME_A_COMMAND"-
$ THEN GOTO exit
$ WRITE sys$output record
$ GOTO single_flush
$open_failure:
$ ON WARNING THEN EXIT
$ COPY/LOG Netdcl.Com 'nodespec'::
$ WAIT 0:0:1
$ OPEN/READ/WRITE dcl_server 'nodespec'::"TASK=NETDCL"
$ ON WARNING THEN GOTO exit
$ GOTO flush_output
$exit:
$ CLOSE dcl_server
$ EXIT
$network:
$ OPEN/READ/WRITE dcl_link sys$net
$ SET NOON
$ dcl_verify = 'f$verify(0)'
$ DEFINE sys$output dcl_link:
$server_loop:
$ WRITE dcl_link "SEND_ME_A_COMMAND"
$ READ dcl_link dcl_string /END_OF_FILE=server_exit /ERROR=server_exit
$ 'dcl_string'
$ GOTO server_loop
$server_exit:
$ IF dcl_verify THEN set verify
$ CLOSE dcl_link
$ DEASSIGN sys$output
$ EXIT

```

## APPENDIX B

ALLUSER.PAS - Show all registered users

```

{
* alluser.pas - get names of all users
* by Deep, 1989
* This program is freely redistributable as long no modifications are made
* DISCLAIMER: I take no responsibility for any use or abuse of this
* program. It is given for informational purpose only.
*
* program history:
* 04-May-89 started
* 02-Jun-89 clean up of code
*
}
[inherit ('sys$library:starlet.pen')]
program alluser(input,output);

 type $word = [word] 0..65535;
 $byte = [byte] 0..255;
 $quadword = record
 lo,hi : unsigned;
 end;
 $uquad = record
 lo,hi : unsigned;

```



```

 end;
var
 id: unsigned;
 status, status2: integer;
 length: $WORD;
 attrib, context, context2, context3: unsigned;
 ident, ident2: unsigned;
 name: varying [512] of char;
 holder: $uquad;

begin

writeln('Alluser - use at your own risk!');
status := SS$_NORMAL;
{ id = -1 selects next identifier }
id := -1;
context := 0;
while (status <> SS$_NOSUCHID) do
 begin
 { find next identifier }
 status := $idtoasc(id, name.length, name.body, ident, attrib, context);
 if (status <> SS$_NOSUCHID) then begin
 write(pad(name, ' ', 16));
 if (ident div (65536*32768) > 0) then
 { it's a rights-list, so print the hex-value of the identifier }
 begin
 writeln(oct(ident, 12));
 context2 := 0;
 context3 := 0;
 { find all holders of this right }
 repeat
 holder := zero;
 status2 := $find_holder(ident, holder, attrib, context2);
 if (holder.lo <> 0) then begin
 ident2 := ident;
 { get UIC and username }
 status := $idtoasc(holder.lo, name.length, name.body, ident2
 , attrib, context3);
 write(' ', pad(name, ' ', 16));
 writeln([' ', oct(holder.lo div 65536, 3), ', ',
 , oct(holder.lo mod 65536, 3), ']');
 end;
 until (holder.lo = 0);
 end
 else
 { it's a UIC, so translate to [grp, user] }
 begin
 writeln([' ', oct(ident div 65536, 3), ', ',
 , oct(ident mod 65536, 3), ']');
 end;
 end;
 end;
 end;
 end.

```

This article has been brought to you by Deep Thought of West Germany. If you liked this article, grant me access if I once drop in your BBS!

---

Received: (from C483307@UMCVMB for TK0JUT1@UCLAMAIL via NJE)  
 (C483307-9202; 114 LINES); Tue, 27 Jun 89 15:54:16 CDT  
 Date: Tue, 27 Jun 89 15:54 CDT  
 To: TK0JUT1



have locked the DECNET-Account for NETDCL.COM. Their system managers are probably afraid of unauthorized access, but I cannot imagine how there could be such an unauthorized access, because you cannot log on this account -- no chance for trojan horses, etc.

Some system managers called me back after I visited their VAX to chat with me about the network and asked me if they could help me in any way. One sysop from Stuttgart even sent me a version of NETDCL.COM for the ULTRIX operation system.

Then, after a month, the H O R R O R came over me in shape of a the following mail:

```

From: TUEBINGEN::SYSTEM 31-MAY-1989 15:31:11.38
To: FRAMSTAG
CC:
Subj: don't make any crap, or you'll be kicked out!
```

```
From: ITTGPX::SYSTEM 29-MAY-1989 16:46
To: TUEBINGEN::SYSTEM
Subj: System-breaking-in 01-May-1989
```

To the system manager of the Computer TUEBINGEN,

On May 1st 1989 we had a System-breaking-in in our DECNET-account, which started from your machine. By help of our accounting we ascertained your user FRAMSTAG to have emulated an interactive log-on on our backbone-node and on every machine of our VAX-cluster with the "trojan horse" NETDCL.COM. Give us this user's name and address and dear up the occurrence completely. We point out that the user is punishable. In case of repetition we would be forced to take corresponding measures. We will check whether our system got injured. If not, this time we will disregard any measure. Inform us via DECnet about your investigation results -- we are attainable by the nodenumber 1084::system

Dipl.-Ing. Michael Hager

```

My system manager threatened me with the deleting of my account, if I
would not immediately enlighten the affair. *Gulp*!
```

I was conscious about my innocence, but how to tell it to the others? I explained, step by step, everything to my system manager. He then understood after a while, but the criminal procedure still hovered over me... so, I took quickly to my keyboard, to compose file of explanations and to send it to that angry system manager in Stuttgart (node 1084 is an institute there). But no way out: He had run out of disk quota and my explanation-mail sailed into the nirwana:

```

$ mail explanation
To: 1084::system
%MAIL-E, error sending to user SYSTEM at 1084
%MAIL-E-OPENOUT, error opening SYS$SYSROOT:[SYSMGR]MAIL$00040092594FD194.MAI;
as output
-RMS-E-CRE, ACP file create failed
-SYSTEM-F-EXDISKQUOTA, disk quota exceeded

```

Also the attempt of a connection with the PHONE-facilty failed: In his borderless hacker-paranoia, he cut off his PHONE... and nowhere is a list with the REAL-addresses of the virtual DECnet-addresses available (to prevent hacking). Now I stood there with the brand "DANGEROUS HACKER!" and I had no chance to vindicate myself. I poured out my troubles to an acquaintance of



[illegible]

Here is a shell script that can be use to send fakemail from any Unix system.  
Have fun and stay out of trouble.

-Dark Overlord

----- Cut here -----

```

! /bin/sh
#Mfakemail - A shell script to send fakemail.
#M##M#M^Set up the path.
PATH=/usr/ucb:/bin:$HOME/Bin
#M^Parse the command line
case $ in
0)echo "USAGE: user@host [from@somewhere] [mailer_host]" >& 2
exit 1
;;
1)mailto=$1
from="person@campus"
mailerhost=localhost
;;
2)mailto=$1
from=$2
mailerhost=localhost
;;
3)mailto=$1
from=$2
mailerhost=$3
;;
*)echo "USAGE: user@host [from@somewhere] [mailer_host" >& 2
exit 1
;;
esac
#M^Create a header for sendmail
cat <<E!O!F!> /tmp/cli$$
helo $mailerhost
mail from:$from<$from>
rcpt to: $mailto <$mailto>
data
From: $from
To: $mailto
Subject:
Status: RO

E!O!F!
#M^Edit the mailer
vi /tmp/cli$$
#M^Add a ending for the mailer
cat <<E!O!F!>> /tmp/cli$$
.
quit
E!O!F!
#M^Connect to the remote host's sendmail daemon
telnet $mailerhost smtp < /tmp/cli$$
#M^Clean up time
/bin/rm -f /tmp/cli$$

```

==Phrack Inc.==

Volume Three, Issue 27, File 9 of 12

+=====+

The Postal Inspection Service

(C) UNITED STATES POSTAL SERVICE (U.S. MAIL)

Brought to you by

Vendetta

May 10, 1989

+=====+

#### Protecting The U.S. Mails

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The protection of the U.S. Mail and the mail system is the responsibility of the Postal Inspection Service. As the law enforcement and audit arm of the U.S. Postal Service, the Inspection Service is a highly specialized, professional organization performing investigative, law enforcement, and audit functions essential to a stable and sound postal system.

As our country's oldest federal law enforcement agency, the Inspection Service has jurisdiction in all criminal matters infringing on the integrity and security of the mail, and the safety of all postal valuables, property, and personnel.

Since the beginning of a postal system in this country, criminal and administrative problems of the Postal Service have been interwoven. By detecting and investigating crimes against the mail and postal revenue, establishing safe and efficient postal systems, protecting all postal properties, assuring that the postal system is not criminally misused to the detriment of the public, the Inspection Service plays an integral part in maintaining effective operations in the Postal Service.

The agency's activities make a vital contribution to the protection of the nation's economy. Security and enforcement functions of the Inspection Service provide assurance to American business for the safe exchange of funds and securities through the U.S. Mail, and to postal customers of the sanctity of the seal in transmitting correspondence and messages to all parts of the world. Audits ensure stability to financial operations, help control costs, and promote increased efficiency in our Postal Service.

#### Postal Inspectors

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Postal Inspectors are the fact finding and investigative agents of the U.S. Postal Service. Today nearly two-thirds of their time is spent in investigating and solving postal related crimes. Possessing statutory power of arrest, they apprehend violators of the law and work closely with U.S. Attorneys in prosecuting cases in court. Their work also includes crime prevention, the audit of postal operations, investigation of accidents and a wide variety of other service and audit matters.

The work of a Postal Inspector requires total dedication and a willingness to

work long hours. Investigations of postal crimes which often entail interstate or international coordination, and the responsibility to restore mail service following catastrophes such as floods, fire, and airplane wrecks, are time-consuming and can be hazardous.

There are approximately 1,900 Postal Inspectors stationed in the United States and Puerto Rico. All trainees undergo an eleven-week basic training course involving use of firearms, defensive tactics, legal matters, search and seizure, arrest techniques, court procedures, postal operations, audit functions, and a detailed study of the federal laws in which the Inspection Service has jurisdiction. Classes are conducted at the Inspection Service training center in Potomac, Maryland.

Refresher courses keep Inspectors informed of current court decisions, laws, and legal procedures. Additional specialized courses are continually held to equip the Service with expertly trained personnel.

All applicants for the position of Postal Inspector must successfully complete the following steps; entry examination; a comprehensive background investigation including a medical examination; the candidate assessment center review; and all phases of the basic training course.

#### Inspection Service Activity

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Criminal investigations and postal crime prevention represent the greatest portion of Inspection Service activity.

Postal Inspectors investigate violations of all postal laws and other related criminal violations. Crimes within the purview of postal investigations include mail fraud, the illegal transmission of controlled substances through the U.S. Mail, the mailing of child pornography, thefts of mails or postal valuables, assaults on postal employees, bombs sent through the mails or directed against postal properties, and the mailing of matter containing poison, unauthorized concealable firearms, and harmful or prohibited articles.

Five crime laboratories located throughout the country assist Inspectors in analyzing evidentiary material needed for identifying and tracing criminal suspects and in providing expert testimony for cases brought to trial.

The objectives of postal crime prevention are to anticipate, identify, and analyze those areas of greatest crime risk potentially affecting employees, funds, property, and postal customers. Postal Inspectors then take action to remove or reduce that risk and maintain the integrity of the Postal Service.

"The Postal Inspection Service is responsible for the internal audit of the Postal Service."

Postal Inspectors provide management with independent audits and investigations of all postal activities as a part of the Postal Service's internal control system.

Audits of installations and systems protect the assets of the Service, improve its financial management system, assist in the resolution of customer complaints, investigate matters of Congressional interests, and identify specific improvements for better customer service and more economical operations.

Financial audits provide an independent check on the adequacy and effectiveness of control systems; verify the existence of assets and ensure the proper safeguards are maintained. Operations audits are conducted to assist postal management in the operation of an efficient, and reliable Postal Service.

## Security Force

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Postal Police Officers provide protection to mail, postal valuables, postal employees, facilities, and vehicles of the Postal Service. As part of the law enforcement team, they assist Postal Inspectors in the enforcement of certain postal laws and regulations on postal premises and provide mobile response units in emergency situations involving the Postal Service.

Equipped with portable radios and alerted by closed circuit television they provide perimeter security to major postal facilities and other buildings operated by the Postal Service. Their presence in postal installations throughout the country is a deterrent to postal crimes and an aid to employee morale.

Postal Police Officers also are used to escort high value mail while in transit between postal units and at airports.

Experience in military or civil law enforcement, industrial security, or similar occupations is an asset for positions in the Security Force. All appointees undergo a four-week training course conducted at the Inspection Service's training center.

## Coordination With Other Agencies

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The Inspection Service extends full cooperation to all local and federal investigative and prosecutive authorities in law enforcement matters to ensure greater protection to the public. Postal Inspectors participate in the Department of Justice national strike force teams aimed at curtailing widespread criminal acts of an organized nature. Postal Inspectors also work closely with the External Auditors in providing support to the certification of the Postal Service's financial statements.

## Conviction Rate

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The Inspection Service maintains a consistently high conviction rate each year of approximately 98% of cases brought to trial, a rate not exceeded by any other federal law enforcement agency.

## Jurisdiction, Postal Laws, and Protection

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The Inspection Service exercises investigative jurisdiction over approximately 85 postal-related statutes. These can be grouped in two categories: Criminal acts against the mails, postal facilities, or postal personnel; and criminal misuse of the postal system.

## MAIL FRAUD

All criminal activity involving use of the U.S. Mail with intent to defraud comes under the jurisdiction of the Postal Inspection Service. The Mail Fraud Law is the oldest consumer protection law in the United States and is one of the most effective prosecutive tool in fighting white collar and organized crime. Millions of dollars are lost each year through mail fraud which cheats not only the poor and the elderly, but businessmen and the consumer as well. Prevalent schemes include insurance, banking, false billings; land and advance-fee selling swindles; franchise schemes; work-at-home and fraudulent diploma schemes; charity schemes; promotions of fake health cures, beauty devices, fast-working diets, and sex stimulants; chain letters, lotteries, and solicitations for the sale of advertising specialty items.



While Postal Inspectors have no statutory authority to act as intermediaries in the settlement of unsatisfactory financial or property transactions conducted through the mails, their investigations frequently result in the discontinuance of fraudulent or borderline operations. Administrative mail-stop orders may be issued to prevent continuing public loss while sufficient evidence is being developed for criminal prosecutive action in the courts, or in cases where false representations, but not necessarily fraudulent intent, can be proven. The Inspection Service has a leading role in consumer protection through the implementation of educational programs designed to prevent mail fraud schemes from developing, and through its efforts to resolve complaints relating to consumer/vendor misunderstandings or poor business practices.

#### ORGANIZED CRIME

Investigations by Postal Inspectors in organized crime matters most frequently relate to cases involving theft and fencing of large amounts of stamp stock and securities by organized post office burglary rings; insurance and investment frauds; and planned bankruptcies and schemes aimed at looting company assets. The Organized Crime Control Act of 1970 specifically includes violation of the Mail Fraud Statute as "racketeering activity." Postal Inspectors are assigned to the Justice Department Organized Crime Strike Forces which operate at various points throughout the country.

#### MAIL THEFT/BURGLARY/ROBBERY

Investigation of mail theft offenses are a large part of the Inspection Service's responsibilities and most commonly involve stolen checks, food coupons, or other negotiable securities. Primary attention is directed at major gangs, sophisticated fencing operations, large scale thefts, and the implementation of preventive programs.

Burglaries of post offices range from vandalism to high level burglary rings and fencing operations involving organized crime activity.

Armed robberies endanger the lives of postal employees and the public and, therefore, are priority investigations. The targets of these crimes usually are postal facilities, vehicles transporting mail, and individual employees, primarily letter carriers.

#### DRUGS

Illegal trafficking in drugs, narcotics, and other controlled substances through the mail is investigated in conjunction with other federal and state law enforcement agencies.

#### PORNOGRAPHY

The Inspection Service investigates violations of the Postal Obscenity Statute enacted in 1865 which prohibits the sending of obscene materials through the U.S. Mail. This includes the investigation of child pornography offenses involving the sexual abuse or exploitation of children based on laws passed in 1977 and 1984.

#### BOMBS

Investigations of incidents of threats involving bombs and incendiary devices sent through the mails or directed at postal properties or functions are within

the jurisdiction of the Inspection Service.

## EXTORTION

The Inspection Service has investigative responsibility in incidents involving use of the mails to extort money or property by threat of injury to person's reputation or by accusing a person of a crime.

## OTHER PROHIBITED MAILINGS

The mailing of poisons or other harmful matter prohibited by law is investigated by Postal Inspectors.

## Assistance From The Public

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In most cases, the Inspection Service must rely on the watchfulness and alertness of mail recipients to inform them of possible criminal or harmful activity involving the use of the mails. Any suspected violations of postal laws or misuse of the mails should be reported to the local Postmaster for referral to a Postal Inspector. Prompt action on the part of postal customers and Postal Inspectors is essential in the interest of crime prevention and detection.

==Phrack Inc.==

Volume Three, Issue 27, File 10 of 12

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Welcome to Issue XXVII of Phrack World News!

This issue features articles on SouthernNet's hacker scam, the Florida probation sex incident, bulletin boards in Argentina, fax attacks, computer security, other hacking occurrences, as well as more articles and new information about Kevin David Mitnick (aka Condor), Robert Tappan Morris, Karl Koch (Hagbard Celine, one of Clifford Stoll's "Wily Hackers"), TRW and Social Security Administration, the National Crime Information (NCIC) "Super Database," and many other fun stories.

Because of our temporary exile from Bitnet, this will be the last regular issue of Phrack World News until next Fall. Next issue expect to see the full write-up on the details and fun events of SummerCon '89. It is only two days away as of this writing (it kinda begins on Thursday evening for some of us) and it looks to be the best SummerCon ever!

A very special thanks goes to Delta Master, Hatchet Molly, and The Mad Hacker

who all assisted with this issue's PWN by submitting articles. Hatchet Molly will be serving as a collection agent for Phrack Inc. during the summer. Be sure to forward any news articles to him that seem relevant to PWN and he will get them to me (eventually). He can be reached on the wide area networks at;

(Hatchet Molly)

TK0GRM2@NIU.BITNET  
TK0GRM2%NIU.BITNET@CUNYVM.CUNY.EDU

One other thing to mention here is a special hello to one of our government readers... Peter Edmond Yee of NASA's Ames Research Center. He had recently remarked that he "had access to Phrack!" I wonder if he thought that Phrack Inc. was top secret or hard to get? Still if he wanted it that badly, Taran King and I thought, "Why not make it easier on him and just send it to his network address?" We did :-)))

:Knight Lightning

"The Real Future Is Behind You... And It's Only The Beginning!"

Mitnick Plea Bargain Rejected By Judge As Too Lenient

April 25, 1989

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Excerpts from Kim Murphy (Los Angeles Times)

"Mr. Mitnick, you have been engaging in this conduct for too long, and no one has actually punished you. This is the last time you are going to do this."

Reportedly U.S. District Judge Mariana Pfaelzer unexpectedly rejected the plea bargain of Kevin Mitnick, the hacker once called "as dangerous with a keyboard as a bank robber with a gun." Pfaelzer declared that Mitnick deserves more time behind bars.

As reported in recent issues of Phrack World News, "Mitnick pleaded guilty to one count of computer fraud and one count of possessing unauthorized long-distance telephone codes... Mitnick faces one year in prison. Under a plea agreement with the government, he must also submit to three years' supervision by probation officers after his release from prison."

On April 24, 1989 Judge Pfaelzer said, "Mr. Mitnick, you have been engaging in this conduct for too long, and no one has actually punished you. This is the last time you are going to do this." She said a confidential pre-sentence report recommended that she exceed even the 18-month maximum prison term called for under mandatory new federal sentencing guidelines. The judge's action voids Mitnick's guilty plea.

Both prosecuting and defense attorneys were surprised. Mitnick's attorney said he did not know whether his client would agree to a guilty plea carrying a longer prison term. This could make it harder to bring charges against Mitnick's alleged associates. If Mitnick is brought to trial, testimony from at least one of his associates would be required to convict him, and they would not appear as witnesses without receiving immunity from prosecution.

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Computer Hacker Working On Another Plea Bargain

May 6, 1989

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Excerpts from the Los Angeles Herald Examiner

Attorneys said yesterday they are negotiating a second plea bargain for computer hacker Kevin Mitnick, whose first offer to plead guilty was scuttled

by a judge because it called for too little time in prison.

Mitnick, 25, of Panorama City, California offered in March to serve one year in prison and to plead guilty to computer fraud and possessing unauthorized long-distance telephone codes.

Mitnick Update

May 10, 1989

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Excerpts taken from the Los Angeles Times

When last we heard about Kevin Mitnick, the hacker once called "as dangerous with a keyboard as a bank robber with a gun," the judge, Judge Mariana Pfaelzer, had rejected a plea bargain as too lenient, saying Mitnick deserved more than the agreed one year of jail time [see above articles].

According to more recent information, Mitnick has now reached a new agreement, with no agreed-upon prison sentence. He pleaded guilty to stealing a DEC security program and illegal possession of 16 long-distance telephone codes belonging to MCI Telecommunications Corp. The two charges carry a maximum of 15 years and a \$500,000 fine. The government agreed to lift telephone restrictions placed on Mitnick since he was jailed in December, 1988.

At DEC's request, Mitnick will help the firm identify and fix holes in its security software to protect itself from other hackers. He will also cooperate in the government's probe of Leonard DiCicco, a fellow hacker. (DiCicco is the "friend" who turned Mitnick in.)

Kenneth Siani Speaks Out About Kevin Mitnick

May 23, 1989

~~~~~

Kevin Mitnick, the hacker "so dangerous that he can't even be allowed to use a phone." "He could ruin your life with his keyboard." "Armed with a keyboard and considered dangerous."

These are some of the things that have been said about this person. All of this media hype would be fine if it just sold newspapers. But it has done much more than just sell a few papers. It has influenced those that will ultimately decide his fate. I myself do not know the man, but I have talked to others that do. Including one of the persons that investigated Mitnick. From all I have heard about him, I think he is a slime ball! But even a slime ball should not be railroaded into a prison sentence that others of equal or greater guilt have avoided.

I personally feel the man is just a criminal, like the guy that robs a 7/11, no better but certainly not any worse. Unfortunately he is thought of as some kind of a "SUPER HACKER." The head of Los Angeles Police Dept's Computer Crime Unit is quoted as saying, "Mitnick is several levels above what you would characterize as a computer hacker."

No disrespect intended, but a statement like this from the head of a computer crime unit indicates his ignorance on the ability of hackers and phone phreaks. Sure he did things like access and perhaps even altered Police Department criminal records, credit records at TRW Corp, and Pacific Telephone, disconnecting phones of people he didn't like etc. But what is not understood by most people outside of the hack/phreak world is that these things are VERY EASY TO DO AND ARE DONE ALL THE TIME. In the hack/phreak community such manipulation of computer and phone systems is all too easy. I see nothing special about his ability to do this. The only thing special about Kevin Mitnick is that he is not a "novice" hacker like most of the thirteen year old kids that get busted for hacking/phreaking. It has been a number of years since an "advanced" hacker has been arrested. Not since the days of the Inner Circle gang have law enforcement authorities had to deal with a hacker working

at this level of ability. As a general rule, advanced hackers do not get caught because of there activity but rather it is almost always others that turn them in. It is therefore easy to understand why his abilities are perceived as being extraordinary when in fact they are not.

Because of all the media hype this case has received I'm afraid that:

- 1.) He will not be treated fairly. He will be judged as a much greater threat to society then others that have committed similar crimes.
- 2.) He will become some kind of folk hero. A Jesse James with a keyboard. This will only cause other to follow in his footsteps.

I'm not defending him or the things he has done in any sense. All I'm saying is let's be fair. Judge the man by the facts, not the headlines.

Disclaimer: The views expressed here are my own.

Kenneth Siani, Sr. Security Specialist, Information Systems Div., NYMA Inc.

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If you are looking for other articles about Kevin David Mitnick aka Condor please refer to;

|                                                  |            |                    |
|--------------------------------------------------|------------|--------------------|
| "Pacific Bell Means Business"                    | (10/06/88) | PWN XXI. . .Part 1 |
| "Dangerous Hacker Is Captured"                   | (No Date ) | PWN XXII . .Part 1 |
| "Ex-Computer Whiz Kid Held On New Fraud Counts"  | (12/16/88) | PWN XXII . .Part 1 |
| "Dangerous Keyboard Artist"                      | (12/20/88) | PWN XXII . .Part 1 |
| "Armed With A Keyboard And Considered Dangerous" | (12/28/88) | PWN XXIII. .Part 1 |
| "Dark Side Hacker Seen As Electronic Terrorist"  | (01/08/89) | PWN XXIII. .Part 1 |
| "Mitnick Plea Bargains"                          | (03/16/89) | PWN XXV. . .Part 1 |

Computer Intrusion Network in Detroit

May 25, 1989

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Taken from the San Jose Mercury News (Knight-Ridder News Service)

DETROIT -- Secret Service agents smashed what they described as a costly, sophisticated computer intrusion network on Wednesday, May 24, and were surprised to discover it made up largely of teen-agers.

The computer systems of more than 20 companies including the Michigan Department of Treasury, Home Box Office cable television services, [and RCA] were infiltrated, according to agents serving search warrants across the country.

Federal officials said the infiltrations by the network represented fraud of \$200,000 to \$1.5 million in appropriated goods, telephone and computer time.

Agents expected to arrest some adults when they swept down on eight people who allegedly ran the network in several states. Instead, they found only one adult, in Chicago. The rest were teen-agers as young as 14: Two in Columbus, Ohio; two in Boston, Massachusetts; two in Sterling Heights, Michigan [The Outsider and The Untouchable]; and one in Atlanta, Georgia. Agents expected to make another arrest in Los Angeles.

Officials said at least 55 other people nationwide made use of the network's information.

In Sterling Heights, Secret Service agents pulled two eighth-grader boys, both 14, out of school and questioned them in the presence of their parents, who apparently were unaware of their activities. James Huse, special agent in charge of the U.S. Secret Service office in Detroit, said the youths admitted involvement in the scheme.

He said the eight-graders, because they are juveniles, cannot be charged under federal law and will be dealt with by local juvenile authorities.

Authorities believe the mastermind is Lynn Doucett, 35, of Chicago. She was arrested Wednesday, May 24, and is cooperating with authorities, Huse said.

Doucett, who was convicted in Canada of telecommunications fraud, supports herself and two children through her computer intrusion activities, which include using stolen or counterfeit credit cards for cash advances or money orders, according to an affidavit filed in U.S. District Court.

If convicted, she faces up to 10 years in prison and a \$250,000 fine.

Special Thanks to Jedi For Additional Information

HR 1504 -- Beeper Abuse Prevention Act

May 22, 1989

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"Pagers Don't Commit Crimes, Congressmen Do."

The fools in congress assembled are at it again. Three years in jail for selling a pager to a minor? If you didn't believe when Abbie Hoffman said that the drug hysteria was just an excuse for more control of the citizens, think again.

In USA Today was a "face-off" on the issues. According to this article, Representative Kweisi Mfume (D-Md) says the following:

"The drug business is using the latest technology to promote its deadly trade. One such advance, the paging device, or beeper, is now appearing in classrooms and schoolyards. I have introduced the Beeper Abuse Prevention Act to curtail the use of beepers by young people who deal drugs. It would require the Federal Communications Commission to prescribe regulations that would restrict the possession and use of paging devices by persons under age 21.

Law officers say dealers and suppliers send coded messages via beeper to youths in school. The codes translate into messages like "meet me at our regular place after class to pick up the drugs." Drug traffickers are even using 800 numbers now available with regional paging services. A supplier could actually conduct a transaction in Baltimore from Miami, for example.

My bill, H.R. 1504, would require any person selling or renting paging devices to verify the identification and age of every customer; encourage parents and businesses to take more responsibility in their children's or employees' activities; make it unlawful for a person to knowingly and willfully rent, sell or use paging devices in violation of rules prescribed by the FCC (there are provisions for stiff fines and up to three-year prison terms for adults who illegally provide beepers to youths); and require parents or businesses who allow the use of beepers to state that intention with and affidavit at the time of purchase."

He goes on to say that he recognizes that there are legitimate uses of beepers, but we can no longer stand by and watch drugs flow into our neighborhoods. The opposite side is taken by Lynn Scarlett, from Santa Monica, CA. She asks what beepers have to do with the drug trade, and regulating their use will not put a dent in it. She also says that there is little evidence that gun control keeps guns out of the hands of gangsters, and it will take a good dose of wizardry to keep beepers away from bad guys. She finishes with:

"The logic of the Beeper Abuse Prevention Act opens the door for laws to make us sign promises that we won't, we swear, use these things for illicit acts when we buy them. De Tocqueville, that eminent observer of our nation, warned that our loss of freedom would sneak in through passage of quiet, seemingly innocuous and well-intended laws -- laws like H.R. 1504.

Computer Threat Research Association (UK)

March 31, 1989

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For those of you interested an umbrella organization has been established in the United Kingdom to coordinate information on, and research into, all aspects of computer security. In the first instance one of the organization's primary concerns will be combatting the threat posed by computer viruses by acting as a clearing house for virus information and control software.

Below is a copy of an initial letter mailed to prospective members:

The Computer Threat Research Association

The computer threat research association, CoTra is a non-profit making organization that exists to research, analyze, publicize and find solutions for threats to the integrity and reliability of computer systems.

The issue that caused the formation of CoTra was the rise of the computer virus. This problem has since become surrounded by fear, uncertainty and doubt. To the average user, the computer virus and its implications are a worry of an unknown scale. To a few unfortunates whose systems have become victims, it is a critical issue.

The key advantage of CoTra membership will be access to advice and information. Advice will be provided through publications, an electronic conference (a closed conference for CoTra's members has been created on the Compulink CIX system) as well as other channels such as general postings direct to members when a new virus is discovered.

CoTra membership will be available on a student, full or corporate member basis. All software that is held by CoTra that enhances system reliability, such as virus detection and removal software, will be available to all members. It is intended to establish discounts with suppliers of reliability tools and services. A library of virus sources and executables and other dangerous research material will be made available to members who have a demonstrable need.

A register of consultants who have specific skills in the systems reliability field will be published by CoTra and reviews of reliability enhancing software will be produced.

Your support of CoTra will ensure that you have the earliest and most accurate information about potential threats to your computer systems.

CoTra, The Computer Threat Research Association,  
c/o 144 Sheerstock, Haddenham, Bucks. HP17 8EX

Strange Customs Service Clock Department

May 1, 1989

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Written by Vanessa Jo Grimm (Government Computer News) (Page 6)

The U.S. attorney for Washington is reviewing an allegation that a Customs Service official violated the Computer Security Act [PL 100-235 presumably] by altering a computer's internal clock.





Robert T. Morris Suspended From Cornell

May 25, 1989

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Taken from the New York Times

Cornell University has suspended the graduate student identified by school officials as the author of "the Internet worm."

In a May 16th letter to Robert Tappan Morris, age 23, the dean of the Cornell University Graduate School said a university panel had found him guilty of violating the school's Code of Academic Integrity.

He will be suspended until the beginning of the fall semester of 1990, and then could reapply.

No criminal charges have been filed against Morris. A federal grand jury this year forwarded its recommendations to the Justice Department, which has not taken any action.

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Justice Department Wary in Computer Case

May 28, 1989

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by Matthew Spina (Syracuse Herald-American)

### "Is Washington Fearful Of Losing A Landmark Trial?"

Some computer experts theorize that the Justice Department, afraid of bungling what could become a landmark computer case, still doesn't know how to treat the Cornell student whose computer worm slithered nationwide in November, 1988.

A further concern in Washington: A trial in the case might embarrass the Department of Defense if its scientists are asked to detail how their computers were among the thousands crippled by the worm.

For several months, the decision on how to charge 23-year-old Robert T. Morris, Jr. had been before Mark Richard, a deputy assistant attorney general. Within the last few weeks, Richard made a decision that now is being reviewed by an assistant attorney general, according to a computer professional who has been talking with the Justice Department.

"I thought we would have heard something from Washington by now," said Andrew Baxtoer, the assistant U.S. attorney who in November and December presented the case to a grand jury in Syracuse.

The grand jury's report was sent on the the Justice Department, which refuses to comment publicly on the matter because Morris has not been indicted.

"Within the next two weeks I assume that a decision will be made," said one official.

"If they decide to begin an expensive trial, they have to make sure they win so as not to damage future attempts to prosecute under that law," said Eugene H. Spafford, an assistant professor at Purdue University whose analysis of the worm has helped federal investigators. "If they decide not to prosecute, and the total thing that happens is he gets suspended (from Cornell), I will be outraged."

So far, Cornell has taken the only disciplinary measure against Morris, suspending him for the 1989-90 academic year. But the graduate student left the computer science department early in November, the day after the worm spread out of a computer in Upson Hall.

Morris, a computer science graduate student, has been called the author of a rogue computer program, called a worm, that was spread from a Cornell University computer. The program was designed to reproduce and infect any computer linked to the Internet, a network shared by colleges, research centers and military institutions.

However, experts say an error caused the program to replicate out of control, sending thousands of copies into thousands of computers.

If Morris is to be charged with a felony, prosecutors would then have to show he intended to destroy or extract information.

Proving that would be difficult since the program neither destroyed nor removed information from any computer.

To convict Morris on most lesser charges, prosecutors would have to show he intended to harm computers.

Prosecutors also could use a misdemeanor charge requiring them to prove only that Morris gained access to a federal government computer. The worm did reach computers at the Army Ballistics Research Laboratory and NASA's Langley Research Center, among others.

Some computer experts wonder, though, if Defense Department officials will be reluctant to testify publicly about how their computers were penetrated -- even those computers holding non-classified information. In February, at a computer convention in San Diego, Defense Department computer experts detailed some security improvements made to the network since November, but then refused to release copies of their presentation to people at the seminar.

The FBI -- which enforces the Computer Fraud and Abuse Act of 1986 -- and some people in the computer industry are pushing for a vigorous prosecution to display a strong case against computer hacking. Others in the industry, including some of Morris' friends from Harvard University and Cornell, urge leniency because he was trying to demonstrate security flaws with computers.

Other articles about Robert Tappan Morris, Jr. and the Internet Worm are;

|                                                  |            |                   |
|--------------------------------------------------|------------|-------------------|
| "Computer Network Disrupted By 'Virus'"          | (11/03/88) | PWN XXII/Part 2   |
| "Virus Attack"                                   | (11/06/88) | PWN XXII/Part 2   |
| "The Computer Jam: How It Came About"            | (11/08/88) | PWN XXII/Part 2   |
| "US Is Moving To Restrict {...} Virus"           | (11/11/88) | PWN XXII/Part 2 * |
| "FBI Studies Possible Charges In Virus"          | (11/12/88) | PWN XXII/Part 2   |
| "Big Guns Take Aim At Virus"                     | (11/21/88) | PWN XXII/Part 3   |
| "Congressman Plan Hearings On Virus"             | (11/27/88) | PWN XXII/Part 3   |
| "Pentagon Severs Military {...} Virus"           | (11/30/88) | PWN XXII/Part 3 * |
| "Networks Of Computers At Risk From Invaders"    | (12/03/88) | PWN XXII/Part 4 * |
| "Computer Virus Eradication Act of 1988"         | (12/05/88) | PWN XXII/Part 4 * |
| "Breaking Into Computers {...}, Pure and Simple" | (12/04/88) | PWN XXIV/Part 1 * |
| "Cornell Panel Concludes Morris {...} Virus"     | (04/06/89) | PWN XXVI/Part 1   |

\* - Indicates that the article was not directly related to Robert Morris, but did discuss him as well as the Internet Worm incident.

SouthernNet's Anti-Hacker Psychological Con Game

April 1989

~~~~~  
WARNING! Your call is being intercepted!

Error: Setting may not be changed by callers.

Welcome to: S o u t h e r n N e t I n c.

You have reached the SouthernNet Fraud Department, the authorization code you are attempting to use is not valid. Hacking and illegal use of codes are violations of state and federal laws.

We are currently conducting an investigaion for code abuse in your area and we are coordinating the investigation with law enforcement authorities. Persons identified hacking or abusing codes will be prosecuted to the full extent of the law.

I'll see you soon,

Hacker Tracker

-----  
Hold for additional information:

Hacker Tracker is unavailable right now; however, you may avoid possible arrest and/or prosecution by calling Hacker Tracker in person.

You may contact Mr. Tracker between the hours of 9:00 AM and 5:00 PM Eastern Standard Time, Monday - Friday, simply by dialing the access number you have just used and code number 101010 or 011010 if the access you have used requires a seven digit code. Just hold the line for 10 seconds and your call will automatically be routed to Mr. Tracker at no charge to you.

This is \*NOT\* a trick and it will be the intention of SouthernNet Inc. to settle this matter without involving law enforcement authorities if you cooperate with our fraud department 100%.

It will certainly be to your advantage to contact Mr. Tracker as this will reflect your own decision to assist and avoid prosecution by our company!!!

I'll be expecting your call.

Hacker Tracker

Hold a sec... Engaging Auto Page for Hacker Tracker...

50 seconds till disconnect  
40 seconds till disconnect  
30 seconds till disconnect  
20 seconds till disconnect  
10 seconds till disconnect  
5 seconds till disconnect

NO CARRIER

[Do you think anyone believed this and actually called "Hacker Tracker?" -KL]

What's Happening: Computer Security Up

June 4, 1989

~~~~~

Taken from Gannett Westchester Newspapers

[Comments in brackets from Delta-Master]

High-tech companies are spending 64% more [than they previously spent] on computer security, according to a recent survey conducted by the National Center for Computer Crime Data in Los Angeles. The group surveyed 3,500 law

enforcement agencies and computer security experts about computer crime. The prosecution rate is also up -- 6.4% in 1988 from only 2.4% during 1987.

Contrary to popular image, computer hackers aren't always young boys. The study found that 32% of those arrested for computer crimes were female, while only 14% were under 21. The study said 45% of hackers were 25 to 30 years old.

Comments from Delta-Master

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I do not know about you people, but the public's confusion about hackers starts to bother me when they make errors. Seriously, I know of only a few hackers over the age of 21. The fact that the newspapers also equate the thug-like computer criminals with the mastermind-criminal type hacker (you guys) is also pretty annoying, wouldn't you agree? One key phrase you must note: "32% OF THOSE ARRESTED." Oh well, such are the mistakes of newspapers.

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Public Service Commission Bans Operator Companies

April 24, 1989

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By Jerri Stroud (St. Louis Post-Dispatch)

The Missouri Public Service Commission voted 4-1 last week to ban providers of so-called alternative operator services in Missouri because allowing the companies to operate is "not in the public interest."

Alternative operator services companies contract with hotels, motels colleges, hospitals, airports, restaurants and other facilities to provide operator assistance to customers using pay telephones or house phones. Consumer groups have complained about price-gouging by the companies nationwide.

Mark Wheatley, a lawyer for the Office of Public Council, praised the commission's decision.

The Office of Public Council has received numerous complaints about excessive rates and surcharges by alternative operator services companies, said Wheatley. Some alternative operator services companies also have accepted other companies' credit cards without authorization from the companies issuing the cards, he said.

"We feel that it's an extremely important decision by the commission." said Wheatley. But he said he expects the companies affected by the ruling to appeal.

Lawyers for the alternative operator services companies could not be reached for comment.

In it's ruling, the commission said many consumers aren't aware of the rates charged by the alternative operator services companies until they receive "a bill for operator services at prices higher than those to which he is accustomed." Consumer groups say the rates often are twice or three times the rates charged by better-known long-distance companies.

Even if an operator service company identifies itself when a consumer makes a call, the commission said many consumers don't understand the significance of the identification.

"If the end user is not educated as to the intricacies of using an alternative operator services provider, he does not truly have a meaningful choice..." the commission said.

The ruling only affects intrastate calls handled by alternative operator services companies, but it may effectively prevent the companies from providing

interstate service as well.

The commission specifically denied tariff requests from International Telecharge Inc. and American Operator Services Inc. The commission also directed three other companies -- Teleconnect Inc., Dial US, and Dial USA -- to file new tariffs consistent with the ruling.

The ruling allows companies to operate who provide operator services in connection with their business -- long-distance carriers and local telephone companies, for example. But the commission also placed limits on these companies.

Under the ruling, operator services companies must:

- \* Identify themselves to the caller as well as to the party being billed by the call (in the case of a collect or third-party call).
- \* Quote rates to the caller or billed party on request, without charge.
- \* Use calling card verification procedures acceptable to the companies issuing the cards.
- \* Post in a prominent position the company's name, detailed complaint procedures and instruction on how to reach the local telephone company operator and other long-distance carriers.
- \* Transfer emergency traffic to the local telephone company or American Telephone & Telegraph Co. until the alternative services provider can show that it can handle emergency calls adequately.

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Fax Attack

May 13, 1989

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Taken from The Ann Arbor News

"Governor's Attempt To Ban Unsolicited Advertisements Backfires!"

HARTFORD, Conn - The great fax attack of 1989 -- an all-out lobbying campaign against a bill banning unsolicited facsimile advertising -- may have backfired when the governor's fax machine was jammed for hours with unwanted messages.

Starting Thursday, May 11, and continuing Friday, May 12, Governor William A. O'Neill's fax machine has been beeping constantly, spitting out unwanted messages from angry businesses that advertise by fax.

The businesses oppose a bill now awaiting O'Neill's signature that would prohibit them from marketing their products by fax without first obtaining the permission of the recipient. Violators would face a \$200 fine.

Starting Thursday morning, dozens of Connecticut businesses faxed to O'Neill's office a form letter arguing against the fax ban. The stream of fax messages was so constant (40 came in before 10 AM) that the governor's office turned off the fax machine Thursday (May 11).

O'Neill's press secretary, Jon. L. Sandberg, said the governor still hasn't decided whether he will sign the bill. But aides to the governor said the persistent lobbying campaign proved how annoying unwanted messages can be. The inconvenience was compounded because the governor's office was unable to use its fax machine to receive information about spring flooding around the state.

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NYNEX Announces Info-Look Gateway

April 28, 1989

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Introducing a new service for accessing information and more... all through your personal computer!

Starting in May 1989, New York Telephone's INFO-LOOK (tm) Gateway Service can be your link to accessing a variety of information, products and services.

The INFO-LOOK Gateway simplifies on-line computer access to a variety of information providers. When you call the Gateway phone number through your modem, you'll be able to scan a menu of information services.

The types of information services you may choose from include: Entertainment, business, health, food, news, weather, sports, travel, government, educational and reference information. The services, some interactive, are provided by independent companies.

The INFO-LOOK Gateway is easy to use -- even if you're relatively new to using a PC.

What you'll need to use the INFO-LOOK Gateway

1. Virtually any type of personal computer.
2. A modem (300, 1200, or 2400 Baud), and communications software. This enables your computer to communicate with other computers via the telephone system.
3. A New York Telephone Calling Card. If you need a New York Telephone Calling Card, (it's FREE), call your service representative whose number appears on page one of your New York Telephone bill.

Charges for using the INFO-LOOK Gateway

There are \*\* no \*\* Gateway enrollment fees and \*\* no \*\* monthly subscription charges. In most cases, you will be charged (New York people only):

- o A local call to reach the INFO-LOOK Gateway.
- o While you're browsing the Gateway directory of services, or moving between services, you pay \$.05 a minute.
- o Once you connect to a service, the charge is determined by the Service Provider. Some services have a per-minute usage charge. Some services are free. The charges for each service are listed in the Gateway menu.

You'll find most charges itemized on your monthly New York Telephone bill. Some Service Providers may decide to bill you separately and directly for use of their services.

Call for more information:

To get your free INFO-LOOK Gateway information booklet call (toll-free) 1-800-338-2720, Ext. 20, any day from 9 a.m. to 11 p.m.

Note: New York Telephone does not provide or control the services offered through the INFO-LOOK Gateway Service. They are provided by independent companies, which are responsible for the content, character, and quality of their services.

The predictions run \$5 billion now and another \$5-10 billion by 1991.

[INFO-LOOK is already operating in Bell South and Bell Atlantic.]

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## Pacific Bell Plans Access To Computers

June 9, 1989

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Taken from Santa Cruz Sentinel (Section B)

SAN FRANCISCO (AP) -- Pacific Bell said Thursday it hopes to compete with the popularity of television by offering people easy access to computerized libraries, bulletin boards and the use of electronic mail.

PacBell's California On-line -- which will be available to anybody with a personal computer, telephone and calling card -- will be among the first in the nation to use a graphic-based system that simplifies procedures so only a rudimentary familiarity with computers is needed.

"It's going to offer our customers a supplement to their current leisure activities... and among other things we've seen (in trials) a lot of people who got away from the TV," said Roger P. Conrad, director of Videotex Gateway Services.

"We feel this is a more productive way for people to spend their lives and we think a lot of users are going to agree," he added. Users will pay "info-entrepreneurs" fees based on the time they use various services and will be billed on their monthly telephone statements. Unlike some on-line information services, users do not have to subscribe ahead of time.

Conrad said the types of services are limited only by vendors' imaginations. PacBell will make money by selling telecommunication line use to the companies.

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## Bulletin Boards Of Argentina

June 5, 1989

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Country Code = 54 (Argentina)

City Code = 1 (Buenos Aires)

This list might be slightly incorrect due to the passage of time. The last update was on December 23, 1986.

| Name                  | Hours Of Operation | ===== Number= |
|-----------------------|--------------------|---------------|
| ----                  |                    |               |
| Beta                  | 23:00 - 6:30       | 802-0288      |
| C-Mania               | 21:00 - 7:00       | 362-8843      |
| CBM                   | 16:00 - 12:00      | 90-4988       |
| Century 21            | 24 hours           | 632-7070      |
| Cerebruss             | 24 hours           | 47-2717       |
| Cerebruss Information | ?                  | 48-8300       |
|                       |                    | 48-9886       |
| Databank              | ?                  | 44-9760       |
| Drean Conection       | ?                  | 953-2523      |
| Los Pinos             | 13:00 - 19:00      | 21-0375       |
| Magenta               | ?                  | 392-0124      |
| Magenta               | ?                  | 392-0016      |
| Maxes                 | 23:00 - 7:00       | 542-2695      |
| Mendieta              | 22:00 - 8:00       | 654-6999      |
| Pirates Cove          | 24:00 - 6:00       | 783-5023      |
| Sanctuary             | 24:00 - 3:00       | 641-4608      |
| Soft-work             | 22:30 - 9:00       | 88-2065       |
| TCConection           | 19:00 - 12:00      | 22-4197       |
| The Connection        | 24 Hours           | 82-5780       |
| The Hacker            | 23:00 - 7:00       | 748-2005      |
| Tiger                 | ?                  | 784-2226      |
| XCASA                 | ?                  | 611-8136      |
| BBS-IOM               | 24 Hours           | 804-3602      |

Note: The settings for all systems listed above are Even, 7, 1.

Contributed by Noli

==Phrack Inc.==

Volume Three, Issue 27, File 12 of 12

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PWN PWN PWN PWN PWN PWN PWN PWN PWN PWN PWN PWN PWN PWN PWN
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PWN Issue XXVII/Part 3 PWN
PWN June 20, 1989 PWN
PWN Created, Written, and Edited PWN
PWN by Knight Lightning PWN
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One of Cliff Stoll's "Wily Hackers" Is Dead (Suicide?) June 5, 1989

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According to West German publications, the "Wily Hacker" Karl Koch, of Hannover, West Germany, died Friday, June 3, probably by suicide. His body was found burnt (with gasoline) to death, in a forest near Celle (a West German town near Hannover where he committed his hacks, as had been observed by German Post).

Koch was one of the 2 hackers who confessed their role in the KGB hack to the public prosecutors, therewith bringing the case to public attention. As German newspapers report, he probably suffered from a psychic disease: He thought he was permanently observed by alien beings named Illimunates' which tried to kill him. Probably, he had internalized the role of "Captain Hagbard" (his pseudonym in the hacking scene), taken from a U.S. book, who (like him) suffered from supervision by the Illuminates. Police officials evidently think that Koch committed suicide (though it is believed, that there are "some circumstances" which may also support other theories; no precise information about such moments are reported).

According to German police experts, Karl Koch's role in the KGB case as in daily life can properly be understood when reading this unknown book.

Information Provided by Klaus Brunnstein  
(University of Hamburg)

[Illuminates... KGB... whatever... -KL]

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Illuminatus! June 14, 1989

~~~~~  
The book in question is believed to be "Illuminatus!" by Harold Shea and Robert Anton Wilson. The book is a spoof on conspiracy theories, and suggests that many and probably all human institutions are just fronts for a small group of "enlightened ones," who are themselves a front for the Time dwarves from Reticuli Zeta, or perhaps Atlantean Adepts, remnants of Crowley's Golden Dawn, or even more likely the Lloigor of H.P. Lovecraft's Cthulhu Mythos. A leading character in this book is named Hagbard Celine.

"Illuminatus!" is a fun read if you like psychedelia and paranoia. It also seems to have influenced a lot of subsequent work, most notably Adams'



"Hitchhiker's Guide to the Galaxy." It is easy to see how an unbalanced mind, taking it literally, could be completely absorbed. In fact "Illuminatus!" seems as if it was written with the intent of just this sort of programming, referring to it as "Operation Mindfuck."

This is probably not a real danger for the vast majority of sane adults, but it may, tragically, have been the case here. Or perhaps, no disrespect intended, Koch may in the course of various hacks really have discovered too much about the Illuminati. After all, they are supposed to be the secret power behind the KGB :-)

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For more information on Clifford Stoll and the Wily Hackers of West Germany, please see:

"Who Is Clifford Stoll?" (No Date) Phrack World News issue XXII/Part 1  
"A Message From Clifford Stoll" (1/10/89) Phrack World News issue XXIII/Part 2

And the following articles all found in Phrack World News issue XXV/Part 2:

|                                                     |          |
|-----------------------------------------------------|----------|
| "German Hackers Break Into Los Alamos and NASA"     | (3/2/89) |
| "Computer Espionage: Three 'Wily Hackers' Arrested" | (3/2/89) |
| "Computer Spy Ring Sold Top Secrets To Russia"      | (3/3/89) |
| "KGB Computer Break-Ins Alleged In West Germany"    | (3/3/89) |
| "News From The KGB/Wily Hackers"                    | (3/7/89) |

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Sex Put On Probation By Mystery Hacker

June 13, 1989

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Ft. Lauderdale News and Sun-Sentinel

"Yes, you sound very sexy, but I really need a probation officer."

DELRAY BEACH, Fla. -- Callers trying to dial a probation office in Delray Beach, Fla on Monday, June 12, heard a smorgasbord of sex talk from a panting woman named Tina instead.

Southern Bell telephone officials said a computer hacker reprogrammed their equipment over the weekend, routing overflow calls intended for the local probation office to a New York-based phone sex line.

"People are calling the Department of Corrections and getting some kind of sex palace," said Thomas Salgluff, a spokesman for the Palm Beach County probation office.

Southern Bell officials said it was the first time their switching equipment has been reprogrammed by an outside computer intruder. Southern Bell provides local telephone service in Florida, Georgia, North Carolina, and South Carolina.

"We're very alarmed," said Southern Bell spokesman Buck Passmore. He said such a feat would require someone with considerable computer knowledge.

The implications of such a computer breach are considerable. Intercepting corporate communications, uncovering unlisted phone numbers, and tampering with billing information are all plausible consequences of computer security breaches at the the phone company.

Hackers have invaded Southern Bell in the past, but they have never reprogrammed a telephone link, Passmore said.

Security technicians from Southern Bell and AT&T are trying to trace the source of the computer breach, Passmore said.

## Hacking For A Competitive Edge

May 12, 1989

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Taken from the Los Angeles Times

Two former Tampa, FLA TV news managers have been charged with illegally tapping into phone lines and computers at another station to gain a news edge over their competitors. Former new director Terry Cole and assistant news director Michael Shapiro at WTSP-TV have been charged with 17 counts of computer hacking and conspiracy in the theft of information from WTVT-TV through computer phone lines, authorities said. Their arraignment was set for May 19.

If convicted, each could face a maximum prison sentence of 85 years. The two were fired from WTSP when the station learned of the alleged thefts. The break-ins began in November, 1988, but were not noticed until January 12, 1989, when WTVT's morning news producer noticed that files were missing, authorities said.

Computer experts determined that an intruder had rifled the files. Authorities said Shapiro knew WTVT's security system thoroughly because he had helped set it up while working there as an assignment manager before being hired away from WTVT in October.

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## TV News Executives Fired After Hacking Charges From Rival

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Tampa, Fla. -- A Florida television station fired two news executives in the wake of reports that one of them allegedly penetrated a rival station's computer system and stole sensitive information.

WTSP-TV (Channel 10), an ABC affiliate in St. Petersburg, announced that it had fired Assistant News Director Michael Shapiro and News Director Terry Cole.

Shapiro was arrested on February 7th on felony charges for allegedly breaking into a computer system at WTVT-TV (Channel 13) on at least six occasions in January. He was once employed by WTVT as an assistant manager and was responsible for administering the station's computer systems.

Law enforcement officials seized from Shapiro's home a personal computer, 200 floppy disks and an operating manual and user guide for software used at the rival station.

He has been charged with 14 felony counts under Florida Statute 815, which covers computer-related crimes. Each count carries a maximum sentence sentence of 15 years and a \$10,000 fine.

Vince Barresi, WSTP's vice-president and general manager, refused to comment on the two firings. However, in a prepared statement, he said that he told viewers during an 11 PM newscast last Tuesday that the station acted to "avoid any questions about the objective way we do our business in keeping the public informed."

Cole, who hired Shapiro last September, has not been charged by Florida law enforcement officials. He was fired, according to one source, because as director of the news room operations, he is held ultimately for the actions of news staffers. Shapiro and Cole were unavailable for comment.

[Another story that discussed this case was "Television Editor Charged In Raid On Rival's Files" (February 8, 1989). It appeared in Phrack World News Issue XXIV/Part 2. -KL]

National Crime Information Center Leads To Repeat False Arrest May 14, 1989

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by James Rainey (Los Angeles Times)

Mix ups with the databases at the NCIC have caused Roberto Perales Hernandez to be jailed twice in the last three years as a suspect in a 1985 Chicago residential burglary. The authorities confused him with another Roberto Hernandez due to a single entry in the FBI's National Crime Information Center computer.

The two Roberto Hernandezes are the same height, about the same weight, have brown hair, brown eyes, tattoos on their left arms, share the same birthday, and report Social Security numbers which differ by only one digit!

The falsely imprisoned man has filed suit charging the Hawthorne, California Police Department, Los Angeles County, and the state of California with false imprisonment, infliction of emotional distress, and civil rights violations stemming from the most recent arrest last year.

He had previously received a \$7,000 settlement from the county for holding him 12 days in 1986 before realizing he was the wrong man. In the latest incident, he was held for seven days then freed with no explanation.

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Another False Incarceration May 18, 1989

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In his testimony on May 18, 1989 to the Subcommittee on Civil and Constitutional Rights of the Committee on the Judiciary of the U.S. House of Representatives, relating to the National Crime Information Center, David D. Redell cited another case of false incarceration concerning Roberto Perales Hernandez as well as various cases noted earlier -- such as that of Terry Dean Rogan [see below]:

"Only last week, a case in California demonstrated the potential benefit of easy access to stored images. Joseph O. Robertson had been arrested, extradited, charged, and sent to a state mental facility for 17 months. During that entire time, mug shots and fingerprints were already on file showing clearly that he was the wrong man, but no one had taken the trouble to check them."

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These articles show clear examples of the damage and problems caused by this "super" database. People like William Bayse (Federal Bureau of Investigation's Director For Technical Services) and William Sessions (Director of the FBI) either fail to realize this or perhaps they just do not care (as long as something similar does not happen to them).

For those of you who are interested in looking into this further, the first article about this NCIC database was; "'Big Brotherish' Data Base Assailed," (November 21, 1988). It appeared in Phrack World News Issue XXII/Part 3.

Another incident similar to the cases mentioned above concerned Richard Lawrence Sklar, a political science professor at the University of California at Los Angeles. He was mistaken by the computer for a fugitive wanted in a real estate scam in Arizona. Before the FBI figured out that they had the incorrect person, Sklar, age 58, spent two days being strip searched, herded from one holding pen to another, and handcuffed to gang members and other violent offenders. For more details on this case and the case concerning Terry Dean Rogan, please refer to "FBI National Crime Information Center Data Bank," (February 13, 1989) which appeared in Phrack World News Issue XXIV/Part 2 (as well as the Washington Post).

~~~~~

The credit bureau of TRW has been working with the Social Security Administration to verify its database of 140 million names and Social Security numbers. In order to cover the cost, TRW is paying the Social Security Administration \$1 million, while Social Security Administration will provide a matching \$1 million.

Since the Social Security Administration is asking for a budget increase for their computer and telecommunications systems, several legislators are outraged by the fact they they are spending \$1 million for this non-government project. Claiming that the project is "as far away from the mission of the Social Security Administration as anything I have ever come across," Senator David Pryor (D-Ark) questioned the competence and credibility of Social Security Administration Commissioner Dorcas R. Hardy and asked for an investigation by the HHS inspector general.

In addition, several lawmakers such as Dale Bumpers (D-Ark) believe the project to be a violation of civil liberties. Said Bumpers, "I don't like any public institution releasing an individual's private information." The American Law Division of the Congressional Research Service has already concluded that the project is a violation of the Privacy Act of 1974.

[A related article, "Verifying Social Security Numbers," (April 11, 1989) appeared in Phrack World News Issue XXVI/Part 3 (as well as the New York Times on the same date). -KL]

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#### Phrack World News XXVII Quicknotes

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1. The current name assigned to the new network being created by the merger of BITNET and CSNET is ONENET.

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2. NPA 903 Assigned to NE Texas (May 10, 1989) -- It was just announced that those portions of 214 outside Dallas will be changed to 903 in the Fall of 1990.

With 708 assigned to Chicago, 903 assigned to Texas, and 908 assigned to New Jersey, only 909 and 917 remain to be assigned before the format changes.

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3. Details On New Area Code 510 (June 6, 1989) -- The press release from Pacific Bell, quoted in the San Francisco Chronicle, gives the phase-in dates for the new NPA 510.

Inception is scheduled for October 7, 1991, with a four-month grace period when NPA 415 will still work for the affected numbers. Final cutover is scheduled for January 27, 1992.

NPA 510 will encompass Alameda and Contra Costa counties, which currently have 842,388 customers out of the current 2,005,687 customers in NPA 415.

- 
4. New Jersey Area Code To Be Split (April 27, 1989) -- The split is not supposed to occur until 1991. The new NPA will be 908 and it will basically cover the southern "half" of the current 201 area. The affected counties will be Warren, Hunterdon, Middlesex, Union, Monmouth and Ocean, and the southwest corner of Morris). Counties remaining in 201 will be Sussex, Passaic, Bergen, Essex, Hudson, and the majority of Morris.

New Jersey Bell will also start requiring area codes on calls into New York and Pennsylvania that have been considered part of New Jersey local calling areas. This will apparently take effect October 2 and free up about 25 exchanges. Information from the Asbury Park Press.

[This last line somewhat contradicts the first line as far as the dates are concerned. More information as we get it. -- KL.]

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5. New Area Codes For London (April 27, 1989) -- British Telecom has announced that the area code for London is to be changed on May 6th, 1990, due to the increased number of lines needed in the capital.

The existing code is 01-, and the new codes to be introduced are 071- for the centre of the city and 081- for the suburbs. A list was published in the Evening Standard, showing which exchanges will fall in which area.

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6. Member Learns The Hard Way: American Express Is Watching (May 4, 1989) -- This article taken from the San Jose Mercury News describes how American Express called a member to voice their concern that he might not be able to pay his recent bill. American Express was able to access his checking account and find that he had less than what was owed to them. His card was temporarily "deactivated" after the member refused to give any financial information except that he would pay up the bill with cash when it came in.

Apparently, the card application, in finer print, declares that "[American Express reserves] the right to access accounts to ascertain whether you are able to pay the balance." After some arguments with the company, the member comments that "I learned a lesson: My life is not as private as I thought."

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7. Southwestern Bell's QuickSource (April 24, 1989) -- Southwestern Bell Telephone Company is running a one year trial (March 1989 89 - March 1990) of two information services: QuickSource (audiotex) and Sourceline (videotext). The latter requires a terminal of some type, but the former only requires a touch-tone phone for access. The QuickSource number is 323-2000, but cannot be accessed via 1+713+; SWBtCo has blocked access to "the Houston metro area served by SWBtCo," according to the script the woman reads to you when ask for help (713-865-5777; not blocked). The help desk will send you a free QuickSource directory though.
- 

8. Telemail, MCI, AT&T Mail Interconnection (May 16, 1989) -- U.S. Sprint's subsidiary, Telenet has announced an interconnection agreement between Telemail, Telenet's electronic mail product, MCI Mail, and AT&T Mail.

The new arrangement, scheduled to be in effect later this summer, will allow the 300,000 worldwide users of Telemail, the 100,000 users of MCI Mail and the 50,000 users of AT&T Mail to conveniently send email messages to each other.

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9. Illinois Bell Knocked Out For Four Hours! (May 18, 1989) -- Service to over 40,000 Illinois Bell subscribers in the northwest suburbs of Chicago was disrupted for about four hours because of problems with the computer in the switching center.

Phones were either dead or inoperative for incoming and outgoing calls between 9:30 a.m. and 1:40 p.m. because of a software glitch at the central office in Hoffman Estates, IL. Most of the disruption occurred in Hoffman Estates, Schaumburg, Arlington Heights, Hanover Park, and Streamwood, IL.

The exact nature of the problem was not discussed by the Bell spokesman who reported that the outage had been corrected. Apparently the backup system which is supposed to kick in also failed.

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10. SRI Attacked By Kamikaze Squirrels (May 29, 1989) -- It seems that the Data Defense Network SRI's "no-single-point-of-failure" power system failed at the hands, or rather the paws, of a squirrel. The power was off for approximately 9 hours and they experienced no hardware problems. This was

at least the third time that a squirrel has done SRI in.

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11. New York Telephone Freebies (June 10, 1989) (San Francisco Chronicle, p. 2.)  
-- 24 pay phones along the Long Island Expressway were in fact free phones  
because of a programming/database screw-up. They were being heavily used  
for long distance calls by those who had discovered the oversight,  
including many to Pakistan (Police found 15 Pakistani men using the phones  
when they went to investigate after a shooting). There were no estimates  
on the unrecovered cost of the phone calls.
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