THE THEORY OF 'BLUE BOXING'
their history, how they're used, their future

After most neophyte phreaks overcome their fascination with Metrocodes and WATS extenders, they will usually seek to explore other avenues in the vast phone network. Often, they will come across references such as 'simply dial KP + 2130801050 + ST for the Alliance teleconferencing system in L.A.' Numbers such as the one above were intended to be used with a blue box; this article will explain the fundamental principles of the fine art of blue boxing.

Genesis

In the begining, all long distance calls were connected manually by operators who passed on the called number verbally to other operators in series. This is because pulse (aka rotary) digits are created by causing breaks in the DC current. Since long distance calls require routing through various switching equipment and AC voice amplifiers, pulse dialing cannot be used to send the destination number to the end local office (CO).

Eventually, the demand for faster and more efficient long distance (LD) service caused Bell to make a multi-billion dollar decision. They had to create a signaling system that could be used on the LD network. Basically, they had two options: (1) to send all the signaling and supervisory information (ie, ON and OFF HOOK) over separate data links. This type of signaling is referred to as out-of-band signaling, or (2) to send all the signaling information along with the conversation using tones to represent digits. This type of signaling is referred to as in-band signaling. Being the cheap bastards that they naturally are, Bell chose the latter (and cheaper) method— in-band signaling. They eventually regretted this, though (heh, heh)...

In-Band Signaling Principles

When a subscriber dials a telephone number, whether in rotary or touchtone (aka DTFM), the equipment in the CO interprets the digits and looks for a convenient trunk line to send the call on its way. In the case of a local call, it will probably be sent via an inter-office trunk; otherwise, it will be sent to a toll office (class 4 or higher) to be processed.

When trunks are not being used there is a 2600 Hz tone on the line; thus to find a free trunk, the CO equipment simply checks for the presence of 2600 Hz. If it doesn't find a free trunk the customer will receive a re-order signal (120 IPM busy signal) or the 'all circuits are busy...' message. If it does find a free trunk, it 'seizes' it—removing the 2600 Hz. It then sends the called number or a special routing code to the other end or toll office

The tones it uses to send this information are called multi-frequency (MF) tones. An MF tone consists of two tones from a set of six master tones which are combined to produce 12 separate tones. You can sometimes hear these tones in the background when you make a call, but they are usually filtered out so your delicate ears cannot hear them. These are *not* the same as touchtones. To notify the equipment at the far end of the trunk that it is about to receive routing information, the originating end first sends a Key Pulse (KP) tone. At the end of sending the digits, the originating end then sends a STart (ST) tone. Thus to call 914-359-1517, the equipment would send KP + 9143591517 + ST in MF tones. When the customer hangs up, 2600 Hz is once again sent to signify a disconnect to the distant end.

History

In the November 1960 issue of the Bell System Technical Journal, an article entitled 'Signaling Systems for Control of Telephone Switching' was published. This journal, which was sent to most university libraries, happened to contain the actual MF tones used in signaling. They appeared as follows:

DIGIT	TONES
1	700 + 900 HZ
2	700 + 1100 HZ
3	900 + 1100 HZ
4	700 + 1300 HZ
5	900 + 1300 HZ
6	1100 + 1300 HZ
7	700 + 1500 HZ
8	900 + 1500 HZ
9	1100 + 1500 HZ
0	1300 + 1500 HZ
KP	1100 + 1700 HZ
ST	1500 + 1700 HZ
11 (*)	700 + 1700 HZ
12 (*)	900 + 1700 HZ
KP2 (*)	1300 + 1700 HZ

(*) Used only on CCITT SYSTEM 5 for special international calling.

Bell caught wind of blue boxing in 1961, when it caught a Washington State College student using one. They originally found out about blue boxes through police raids and informants. In 1964, Bell Labs came up with scanning equipment, which recorded all suspicious calls, to detect blue box usage. These units were installed in CO's where major toll fraud existed. AT&T security would then listen to the tapes to see if any toll fraud was actually committed. Over 200 convictions resulted from the project. Surprisingly enough, blue boxing is not solely limited to the electronics enthusiast; AT&T has caught businessmen, film stars, college students, doctors, lawyers, high school students, and even a millionaire financier (Bernard Cornfield) using the device. AT&T also said that nearly half of those that they catch are businessmen.

To use a blue box, one would usually make a free call to any 800 number or distant directory assistance (NPA-555-1212). This, of course, is legitimate. When the call is answered, one would then swiftly press the button that would send 2600 Hz down the line. This has the effect of making the distant CO equipment think that the call was terminated, and it leaves the trunk hanging. Now, the user has about 10 seconds to enter in the telephone number he wished to dial—in MF, that is. The CO equipment merely assumes that this came from another office and it will happily process the call. Since there are no records (except on toll fraud detection devices!) of these MF tones, the user is not billed for the call. When the user hangs up, the CO equipment simply records that he hung up on a free call.

Detection

Bell has had 20 years to work on detection devices; therefore, in this day and age, they are rather well refined. Basically, the detection device will look for the presence of 2600 Hz where it does not belong. It then records the calling number and all activity after the 2600 Hz. If you happen to be at a fortress fone, though, and you make the call short, your chances of getting caught are significantly reduced. Incidentally, there have been rumors of certain test numbers that hook into trunks thus avoiding the need for 2600 Hz and detection!

Another way that Bell catches boxers is to examine the CAMA (Centralized Automatic Message Accounting) tapes. When you make a call, your number, the called number, and time of day are all recorded. The same thing happens when you hang up. This tape is then processed for billing purposes. Normally, all tree calls are ignored. But Bell can program the billing equipment to make note of lengthy calls to directory assistance. They can then put a pen register (aka DNR) on the line or an actual full-blown tap. This detection can be avoided by making short-haul (aka local) calls to box off of.

It is interesting to note that NPA + 555-1212 originally did not return answer supervision. Thus the calls were not recorded on the AMA CAMA tapes. AT&T changed this though for 'traffic studies!'

CCIS

Besides detection devices, Bell has begun to gradually redesign the network using out-of-band signaling. This is known as Common Channel Inter-office Signaling (CCIS). Since this signaling method sends all the signaling information over separate data lines, blue boxing is impossible under it.

While being implemented gradually, this multi-billion dollar project is still strangling the fine art of blue boxing. Of course until the project is totally complete, boxing will still be possible. It will become progressively harder to find places to box off of, though. In areas with CCIS, one must find a directory assistance offfice that doesn't have CCIS yet. Area codes in Canada and predominantly rural states are the best bets. WATS numbers terminating in non-CCIS cities are also good prospects.

Pink Noise

Another way that may help to avoid detection is to add some 'pink noise' to the 2600 Hz tone.

Since 2600 Hz tones can be simulated in speech, the detection equipment must be careful not to misinterpret speech as a disconnect signal. Thus a virtually pure 2600 Hz tone is required for disconnect.

Keeping this in mind, the 2600 Hz detection equipment is also probably looking for pure 2600 Hz or else it would be triggered every time someone hit that note (highest E on a piano =2637 Hz). This is also the reason that the 2600 Hz tone must be sent rapidly; sometimes, it won't work when the operator is saying 'Hello, hello.' It is feasible to send some 'pink noise' along with the 2600 Hz. Most of this energy should be above 3000 Hz. The pink noise won't make it into the toll network (where we want our pure 2600 Hz to hit), but it should make it past the local CO and thus the fraud detectors.

(The above was taken from Basic Telecommunications Part VII, written by BIOC Agent 003.)

trashing alaska style

by The GCI Guy

We left that Friday night with no idea that we would end up at our local CO. A group of computer enthusiasts and I usually go cruise and look for trouble in our car properly named The Lead Sled. It is named this because it is an extremely old Monte Carlo that is painted five different shades of gray.

There was nothing happening on the local drag and that is when I remembered something I had seen on a BBS the night before.

"Let's go trashing," I said with hopes of an answer. But all I got was a grumble from the back seat and a question thrown at me from the driver. I explained to them what trashing was and the whole car seemed to like the idea of looking through someone else's garbage, especially our local CO's.

Now the thing that I really hate about our CO is that they have a 'mascot' color, baby blue. They paint their repair trucks, representatives, and main building all this same color.

We carefully turned the engine off when we approached the baby blue monster and coasted behind a group of trees. We had to run about a mile to the dumpsters and I think that this was our biggest mistake. But what can you expect from first time trashers?

The CO has a 'protective' fence around their lot. So we picked a small, thin phreaker to slide under the gate. He then dived into the dumpster with a look of triumph in his eyes.

We waited for him to emerge with a bag when suddenly a man in baby blue overalls appeared. I yelled for everyone to blow and that's what we did. The skinny phreaker slid under the fence and we were history.

I ran fast, the fastest I think I ever ran. But with the CO's security guards after you, you had to. We ran back to the Sled but found that it was surrounded by men in baby blue overalls. This is where we made another mistake—we split up, hoping that maybe we wouldn't be caught if we weren't a large group.

"They've been caught!" was the only thing that ran through my mind as I ran for an abandoned shopping mall. Me and about two other phreakers hid out there for about two hours until we thought the coast was clear. But we were wrong.

As we were making our way back to the Sled, we were stopped by a security guard who asked us *alot* of questions. Luckily we were able to B.S. him. But when we got back to the Sled, it was gone.

I panicked. No Sled, no ride, and no trash. Then suddenly I heard a honk and it was the Sled.

Since that unfortunate experience we have made countless trips to the CO and have retrieved bags and bags of trash. Learn by your mistakes.

SURVEYING THE COSMOS

by Firemonger

COSMOS is Bell's computer for handling infomation on customer lines, special services on lines, and orders to change line equipment, disconnect lines, etc. COSMOS stands for Computerized System for Mainframe Operations. It is based on the UNIX operating system and, depending upon the COSMOS and upon your access, has some, many, or no UNIX standard commands. COSMOS is powerful, but there is no reason to be afraid of it. This article will give some of the basic, pertinent info on how users get in, account format, and a few other goodies.

Password Identification

To get onto COSMOS you need a dialup, account, password, and wire center (WC). Wire centers are two letter codes that tell what section of the COSMOS you are in. There are different WC's for different areas and groups of exchanges. Examples are PB, SR, LK, etc. Sometimes there are accounts that have no password; obviously such accounts are the easiest to hack.

Checking It Out

Let's suppose you have a COSMOS number which you obtained one way or another. The first thing to do would be to make sure it is really a COSMOS system, not some other Bell or AT&T computer. To do this, you would call it and connect your modem, then hit some returns until you got a response. It should say: ';LOGIN:' or 'NAME:'. If you enter some garbage here it should say: 'PASSWORD:'. If you hit a return and it says 'WC?', it is a COSMOS system. If it says something like 'TA%' then you're in business. If it doesn't do any of the above, then it is either some other kind of system, or, if you're not getting anything at all, the dialup has probably gone bad.

Getting In

COSMOS has certain accounts that are usually on the system, one of which might not have a password. They consist of ROOT (most powerful and almost always on the system), SYS (second most powerful, still many privileges), BIN (a little less power), PREOP (a little less), and COSMOS (hardly any privileges, like a normal user). The way to tell if they have passwords is by entering the accounts at the ';LOGIN:' or 'NAME:' prompt, and if it jumps staight to 'WC?', all you need is a WC to get in. But suppose all of the accounts have passwords? You have two choices. You can try to hack the password and WC to one of the above accounts. I won't deal with this method, as it is self explanatory. Or you can do something I find much easier—call the COSMOS during business hours and hope that someone forgot to log off. Keep calling until when you connect and hit return until you get a 'WC%' prompt. 'WC' is the WC that the account you found is currently in. You are now in!

What to Do While Online

The first thing you want to do is write down the WC you are in. The command 'WCFLDS' (!) should list all WC's. On your first login it is a good idea to print everything or dump everything to a buffer. 'WHO' should print everyone currently logged on the system, giving some accounts. 'TTY' tells what terminal port you are on. 'WHERE' should tell the location of the COSMOS installation. 'WHAT' tells what version of COSNIX, COSMOS' operating system, it is. 'LS *' prints all the files you have access to. 'CD / dir' connects you to directory 'dir'. 'Cat / filename' prints file 'filename'. Typing the name of a file runs it. 'ED filename' edits file 'filename'. 'Q' quits the editor. If you've got privileges, you can try to print the password file. To do this, type 'CAT / ETC/ PASSWD'. If you have access, it will print the password file out. The passwords are almost always encrypted, but you get a list of all the accounts. If you are lucky, one of the lines will have two colons after the account name. This means there is no prompt from the ';LOGIN:' or 'NAME:' prompts when you enter that account. If you can't print out the password file, you're going to have to hack a password for an account or call again until you get in the way described above. To logoff, type CTRL-Y. 'TAT' sometimes print a little help file. To do a check on some telephone line, type 'ISH' at the COSMOS 'WC%' prompt. Then type 'H TN XXX—XXXX' (Hunt Telephone Number) to tell you about the local number you are interested in. When the system gives you a '—', you type a '.', and it will type all kinds of info on the phone number you entered (in Bell abbreviations, of course). If it is not a good exchange, it will say something to that effect. You type a period to end the ISH.

If you wish to learn more information about COSMOS, find yourself a COSMOS manual or look at future issues of *2600*. A UNIX manual would also be helpful for standard UNIX commands.
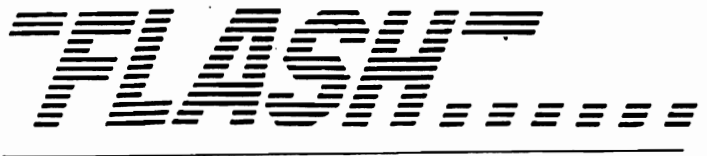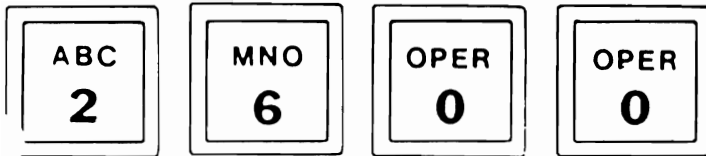
Phreak Roundups

United Press International

Three teen-age computer experts face charges that they used their home computers to cheat telephone companies out of hundreds of thousands of dollars of service.

Officials of Illinois Bell Telephone Company, who have not finished adding up their losses, speculate the youths began by tapping into long-distance lines of local businesses. From there, they started using computers to bypass telephone billing systems.

The youths also raided the American Telephone and Telegraph Company's teleconferencing network [watch future issues for stories on this], permitting up to 59 parties to communicate, as well as other long distance carriers.

The young computer experts, all 15 years old, face juvenile theft charges. Court hearings are scheduled to begin next month.

Toronto Globe and Mail

Seven St. Thomas teenagers have been arrested in Bell Canada's crackdown on the hundreds of Ontario computer buffs who use an illegal softwear [sic] program to place long-distance phone calls for free.

The teenagers, two of whom are juveniles, were charged last week with theft of telecommunications services, and possession of illegal equipment. Police raided their homes and seized computers and softwear valued at $7,000. Unpaid phone calls were placed to points as far away as Florida, police said. In Windsor, Ontario, police charged four youths with telecommunications theft early in January. In December, five University of Waterloo students received absolute discharges after a judge found them guilty of the offense.

All of the charges were laid after complaints from Bell Canada, which is able to detect and identify telephone pirates with its own computer equipment. "We want people to know that there are ways and means of finding out who's circumventing the tolls," said Superintendent William Lawson of the St. Thomas police.

The illegal softwear is a low-cost, high-technology version of the "blue boxes" built by electronic hobbyists in the sixties [and described in full on page 2-7]. "It's a relatively new phenomenon," said James McPeak, a Bell Canada spokesman. "These kids don't know what they're doing. They think it is fun to beat the phone company."

TRW Breached By Non-Hackers

Long Island Newsday

The records of TRW Information Services, which says it holds credit data on 120 million Americans, have been invaded and compromised on a far-reaching scale by adult criminals—not just a handful of teenage hackers—according to law enforcement officials.

On Long Island alone, nearly 30,000 TRW reports were allegedly pilfered by phone in 1982, a figure based on discrepancies in billings between TRW and two banks, a consumer loan firm and two department stores. While three credit collection agencies were separately suspected in the thefts, only one—said to be responsible for the theft of 3,000 reports—will be prosecuted, law enforcement sources said.

The FBI is continuing the investigation, it has been learned, and indictments are said to be imminent.

The collection agency is reported to have used its pilfered data to locate assets of debtors it had been hired to investigate. "They [the collection agency] had a right to subscribe; they just chose to steal the service," said TRW spokeswoman Delia Fernandez. A spokesman for one of the New York-based department stores said his firm had received refunds of about $10,000 from TRW because its password had been used by unauthorized individuals.

This Month's Mischief and Mayhem

Los Angeles Times

A series of phony University of Southern California degrees may have been sold for up to $25,000 each and backed by transcripts illegally placed in the school's computer system.

Thirty USC students are already under investigation for allegedly paying to have unauthorized grade changes made on their transcripts. "Our investigation has widened beyond grade changes," USC Vice Provost Sylvia Manning said. "We are now investigating the possibility that someone may have created entire transcripts as well."

Combined News Sources

Fans trying to call television star Tom Selleck to wish him a happy birthday reached a Honolulu morgue instead after a Boston radio station announced the wrong phone number.

The snafu started when disc jockeys of WROR-FM came up with the idea of having their listeners call Selleck in Hawaii and congratulate him on his 40th birthday. The DJ's called directory assistance for Selleck's home phone number but were apparently given the number for the Honolulu medical examiner's office. By Wednesday afternoon, the medical examiner's office reported receiving more than 1,000 calls.

"The office was out of control," said Joyce Fujimoto, morgue attendant. "When people found out it was the medical examiner's office, they thought Tom Selleck had expired. All these hysterical girls kept calling...there were males, too."

On Friday, Lorna Ozmon, WROR program director, read a statement on the air apologizing for the confusion and saying listeners would be reimbursed for any calls made to the Honolulu number on January 29.

Associated Press

Because of a computer mix-up, the Middle Atlantic district office of the Internal Revenue Service has lost the records of more than $300 million in payroll withholding tax payments made by about 10,000 companies last fall.

The businesses have been told by computer-generated notices from the I.R.S. that their property and bank accounts will be seized if they do not make the payments within 10 days. The companies are gathering official records of bank transfers to the government so they can convince the I.R.S. that they have already paid.

An I.R.S. spokesman said the agency was trying to reconcile its records manually.

The New York Times

Plain brown envelopes full of $100 bills are turning up in residents' mailboxes in central Florida, according to Federal agents, who say the money is counterfeit.

"The bills are all being mailed out of Inglewood, California," said Donald A. Stebbins, of the Orlando office of the United States Secret Service. "They contain no advertising literature, no note, no return address, nothing!"

2600 Bulletin Board Online

2600 News Service

2600 Enterprises, Inc. now has an official computer bulletin board system (BBS) operating 24 hours a day, 7 days a week. Operating out of New Jersey, the board is called The Private Sector. Hobbyists from all over the country use the system to converse on telecommunications topics. Now, subscribers and non-subscribers will be able to send articles, letters, or questions to 2600 instantly.

The system supports 300 and 1200 baud. At present, the maximum length per article sent to 2600 is 100 lines. At command level, users can type "2600" to enter this section. The access number is 2013664431.

According to 2600 co-founder Richard Petrovich, the bulletin board is part of a steady expansion. "We recently acquired 5167512600 as the 2600 Hotline. Now with the board, we'll improve and add to our communications even more. And that's not the end. We're looking into all kinds of networking possibilities—overseas bureaus, that kind of thing. What's closest on the horizon right now though is our plan for a publishing center for lengthy articles and tutorials on phones and computers, phreaking and hacking. We've found quite a few talented writers and this would be a way for them to have their words read in full."

Full details on the publishing/distribution center will be anounced in the future. Interested writers are urged to call us. Donations will, of course, make things happen faster.

"We have every intention of becoming as big as Exxon," Petrovich said. "And think what that could mean to the hackers of the world."

AT&T Keeps "800" Data To Itself

Associated Press

The judge who ordered the breakup of American Telephone and Telegraph Co. has ruled that AT&T does not have to share its sophisticated 800 database with the competition.

U.S. District Judge Harold H. Greene has turned down a request from the Justice Department asking that portions of AT&T's "Common Channel Interoffice Signalling" data be made available to other phone companies, new and old, until they can develop their own systems.

All telephone companies are entitled to use the 800 prefix on phone numbers designated for calls paid for by the receiver.

In 1981 AT&T developed a more sophisticated system so that numbers in the second "field"—the three after the 800 prefix—could be any three numbers and the computer would still be able to find the right phone in the right city to ring. This allows for numbers with verbal significance, like 800-CAR-RENT.

The non-AT&T companies are using a less sophisticated database which doesn't have all of the extras of the AT&T system.

LETTERS FROM YOU

Dear *2600*:

I recently got a notice in the mail from Mountain Bell. Me and 4 other guys roomed together in this apartment and one skipped town after he disconnected his phone. He didn't pay his final bill, so Ma Bell is threatening to have *our phones* cut off because of what *he* did.

The lady at Ma Bell says it's cause this guy left his final billing address as ours, so as far as Ma Bell's concerned, he still lives here and gets phone service by using our phones. Can you believe it?!!

Mad as Hell

P.S. We are now having to pay $20 a month extra to keep our phones connected. People! If you're living with someone and are going to disconnect your fone, give Bell a fake *final billing* address so this doesn't happen to you!

Dear Mad:

It would be amusing if someone were to give a large corporation's address as their final billing address. Theoretically, everybody there would get a threat similar to yours. Realistically, it probably isn't quite that easy. But this is nothing new for telephone companies. We've heard many similar stories and a good deal of them have to do with college students. The telephone company gets away with murder when it comes to dealing with students in dormitories.

Dear *2600*:

My alias is The Crazy Man. I run the board called The Phreak Show. It can be reached at 3039797992. Your magazine is a kick in the ass. Keep up the good work!

Dear *2600*:

Please help me settle something I've long wondered about. Do telephone employees get free phone service or discounts on their phone bill?

SJ

Dear SJ:

From what we've been able to find out, free telephone service is given to management employees and also to those employees that have been around for thirty years or longer. Usually there's a usage allowance of around $35 which includes service charges and local calls. Any charges above that allowance get billed to the employee. Anyone who works for the phone company for more than six months is entitled to a 50 percent discount. These rules, though, probably vary greatly throughout the country.

Dear *2600*:

I recently purchased a TI-99/4A console. I am having trouble producing multi-frequency hertz tones in BASIC. Could you help me?

Another Hacker
Binghamton, NY

Dear *2600*:

As a novice hacker I have a great deal to learn. I have recently purchased an Apple Cat and am currently using "Joshua" for carrier detection and retrieval.

My question is: "What do I do now?"

Is there software or hardware available to hack the passwords and ID numbers or does one just connect and play musical fingers on the keyboard until you get lucky?

Any assistance would be greatly appreciated!

KC
Scottsdale, AZ

Dear Folks:

There are many many programs out there to do just what you want to do. Unfortunately, we don't have programs for these specific computers. But we know many of our readers do. We hope to receive programs in the future so that we can print listings. In the meantime, musical fingers is a method that has proven effective in the past and is still known to work more than a few times.

Dear *2600*:

To start out I would like to say thank you. I have been getting *2600* for a year almost. I stopped phreaking about 8 months ago. At one point in my life phreaking was very important. So if you guys need any info let me know. I will try and get it for you.

Anyways here is a real short story. I was talking with my dad about a year ago when I got into all this stuff. He told me to be careful and watch what I was doing. Then he told me about this new way in which it would make it impossible for someone like you or me to use another person's Sprint code. This would be to make a device that would change the code each and every time you called the number. Your device would make up half and the rest would give you the other half of the code.

Do you know about any books or other good sources for phreaking information? If so, please let me know. I am doing a report for my history class.

Do you have any info on the NSA? Also could you somehow let me know about boxes? Do you know or have any good phreaking board numbers? I feel like a fool asking you for all this stuff. But for now, you are the only ones who can help me out.

Also, if you want info on companies like AT&T, ITT, etc., just let me know. I would just send it all but that would be one hell of a pile.

DB
San Jose, CA

Dear DB:

Almost all of what you're looking for can be found right here in *2600*. We have an article on blue boxes this month and in the past we've focused on other kinds. We're also constantly printing titles of reference materials. There's no reason to feel like a clown for asking questions. Just think of all the others who don't. You've actually heard of the NSA! And you don't seem to think it's another soccer league, as many do. (We'll have lots of info about them soon.)

The device you mentioned sounds interesting. But how would your little device know which numbers to spit out to the main computer? Also, how would it stop hackers from guessing a one-time code *anyway*?

As far as info on other companies, please send it. We get a lot of mail and we read all of it. All of the information we get is eventually conveyed to our readership, so everybody benefits.

Dear *2600*:

How can I make calls to ships at sea? Do they each have their own phone number? Is there a directory?

James

Dear James:

We went right to the folks at AT&T on this one. Here is their reply: "The procedure for placing long distance calls to ships on the high seas are handled in the following manner. [sic] You first must dial the operator and ask to be connected to the high seas operator. The only information you have to provide is the name of the ship and a call letter. The high seas operator then signals the ship. It sometimes takes hours for the ship to return the call. When the ship operator reaches the high seas operator, the call is then connected to the original caller. All calls going to ships on the high seas must be placed this way—calls cannot be directly dialed. There is at this time no printed list indicating ship ID numbers or ocean codes."

As always, *2600* will be more than happy to compile such a list. Keep in mind, also, that failed attempts at reaching a ship (real or imagined) don't cost anything but time.

The 2600 Information Bureau

ACRONYM LIST

-------- A --------

ABHC - Average Busy Hour Calls
ABV - Attendant Busy Verification
ACD - Automatic Call Distributing system
ACS - Advanced Communications System
ACTS - Automatic Coin Telephone Service
ACU - Alarm Control Unit
ADCI - Automatic Display Call Indicator
ADP - Advanced Data Processing
ADS - Automatic Voice System
ADX - Asymmetric Data eXchange
AFADS - Automatic Force Adjustment Data System
AIC - Automatic Intercept Center
AIOD - Automatic Identification Outward Dialing
AIS - Automatic Intercept System
AMA - Automatic Message Accounting
AMARC - Automatic Message Accounting Recording Center
AMPS - Advanced Mobile Telephone Service
ANC - All Number Calling
ANF - Automatic Number Forwarding
ANI - Automatic Number Identification
AP - All Points
ARPANET- Advanced Research Projects Agency Network
ARQ - Automatic Repeat reQuest
ATA - Automatic Trouble Analysis
ATM - Automatic Teller Machine
ATR - Alternate Trunk Routing
ATT - American Telephone and Telegraph
ATTIS - American Telephone and Telegraph Information Systems
AUTOVON- AUTOmatic VOice Network
AUTODIN- AUTOmatic DIgital Network

-------- B --------

BCP - Byte Controlled Protocals
BDT - Billing Data Transmitter
BELCORE- BELL COMmunications REsearch
BHC - peak Busy Hour Calls
BICS - Building Industry Consulting Services
BIOC - Break Into Other Computers
BIS - Business Information System
BLF - Busy Line Field
BO - Busy Override
BOC - Bell Operating Company
BORSCHT- Battery, Overvoltage, Ringing, Supervision, Coding,
         Hybrid, and Testing (no, I didn't make this one up)
BOS - Business Office Supervisor
BPOC - Bell Point Of Contact
BSC - Binary Sychronous Communication
BSI - Business Service Instructor
BSP - Bell System Practices
BTL - Bell Telephone Laboratories

-------- C --------

CAMA - Centralized Automatic Message Accounting
CBS - CrossBar Switching
CC - Country Code (or Calling Card)
CCCF - Central Cross Connect Field
CCI - Computer Carrier Interupt
CCIS - Common Channel Interoffice Signaling
CCITT - International Telephone and Telegraph Consultive
        Committee (in French)
CCS - Cents (100) Call Seconds per hour
CCSA - Common Control Switching Arrangement
CDA - Call Data Accumulator
CDO - Community Dial Office
CEVI - Common Equipment Voltage Indicator
CF - Coin First payphone
CICS - Customer Information Control System
CLR - Combined Line and Recording
CLRC - Circuit Layout Record Card
CMD - Centralized Message Distribution
CMS - Circuit Maintenance System
CN/A - Customer Name / Address
CO - Central Office
COAM - Company Operated and Maintained network
CER - Central Office Equipment Report
COMAS - Central Office Maintenance and Administration System
COS - Class Of Service
COSMIC - COmmon System Main InterConnecting frame
COSMOS - COmputer System for Mainframe OperationS
CPE - Customer Premises Equipment
CREG - Concentrated Range Extention with Gain
CSACS - Centralized Status, Alarm and Control System
CSDC - Circuit Switched Digital Capability
CSL - Coin Supervising Link
CSMA - Carrier Sense Multiple Access
CSO - Central Services Organization
CSP - Control Switching Point
CSS - Customer Switching System
CUG - Closed User Group
CUVI - Common Unit Voltage Indicator

-------- D --------

DA - Directory Assistance (/C - computerized, /M - Microfilm)
DACS - Digital Access Cross Connect System
DAV - Digital Over Voice
DAVID - Digital Over VIDeo
DCE - Data Communications Equipment
DCTS - Dimension Custom Telephone Service
DDD - Direct Distance Dialing
DDS - Dataphone Digital Service
DDX - Distributed Data eXchange
DIAD - (magnetic) Drum Information Assembler / Dispatcher
DIAS - Defense Automatic Integrated System
DID - Direct Inward Dialing
DIS - Distributed Information System
DIV - Data In Voice
DLL - Dial Long Line equipment
DNHR - Dynamic Non-Hierarchical Routing
DNR - Dialed Number Recorder
DNIC - Data Network Identification Code
DOC - Dynamic Overload Control
DP - Dial Pulse
DRE - Directional Reservation Equipment
DSA - Dial System Assistance
DSS - Direct Station Selection(or Digital Switching System)
DTE - Data Terminating Equipment
DTF - Dial Tone First payphone
DTG - Direct Trunk Group
DTMF - Dual Tone Multi Frequency
DTS - Domestic Transmission System
DUV - Data Undr Voice
DV - Destination Vocoder
DVX - Digital Voice eXchange

-------- E --------

EADASS - Engineering and Administrative Data AcquiSition System
EAS - Extended Area Service(or Engineering Admin. System)
EBCDIC - Extended Binary Coded Decimal Interchange Code
ECASS - Electronically Controlled Automatic Switching System
ECDO - Electronic Community Dial Office
ECO - Electronic Central Office
ECS - Electronic Communications Systems
EDTCC - Electronic Data Transmission Central Communications
EFT - Electronic Funds Transfer
EMN - End Marked Network
EMS - Electronic Message System
EO - End Office
EOTT - End Office Toll Trunking
ESAC - Electronic Systems Assistance Center
ESAD - Equal Access Access Service Date
ESB - Emergency Service Bureau (911 exchange)
ESS - Electronic Switching System
ESSEX - Experimental Solid State EXchange
ETFD - Electronic Toll Fraud Device
ETS - Electronic Translation System
EVX - Electronic Voice eXchange

-------- F --------

FACD - Foriegn Area Customer Dialing
FAN - Full Access Network
FAT - Foriegn Area Translation
FDM - Frequency Division Multiplexing
FFS - Freeze Frame Systems
FRU - Field Replacable Units
FSP - Frequency Shift Pulsing
FTG - Final Trunk Group
FTS - Federal Telephone System
FX - Foriegn eXchange

-------- G --------

GTE - General Telephone Electronics

-------- H --------

HACD - Home Area Customer Dialing
HDLC - High level Data Link Control
HNPA - Home Numbering Plan Area
HOBIS - HOtel Billing Information System
HUTG - High Usage Trunk Group

-------- I --------

IDDD - International Direct Distance Dialing
IDF - Intermediate Distributing Frame
IIS - Integrated Information System
INWATS - Inward Wide Area Telephone Service
INADS - INitialization and ADministration System
IOCC - International Overseas Completion Center
IOD - Identified Outward Dialing
IP - Intermediate Point
ISC - International Switching Center
ISIS - International Switched Interface System
ITU - International Telecommunications Union

-------- J --------

JIM - Job Information Memorandum

-------- K --------

KDCI - Key Display Call Indicator
KP - Key Pulse
KSU - Key Service Unit
KTS - Key Telephone System
KTU - Key Telephone Unit

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------- L -------
LAMA   - Local Automatic Message Accounting(C - Computerized)
LAN    - Local Area Network
LCC    - Lost Calls Cleared
LCD    - Lost Calls Delayed
LCH    - Lost Calls Held
LDD    - Local Digital Distribution
LDM    - Limited Distance Modem
LDS    - Long Distance Service
LDX    - Long Distance eXtender
LIU    - Line Interface Unit
LL     - Long Lines
LLN    - Line Link Network
LLP    - Line Link Pulsing
LMOS   - Line Maintenance Operations System
LSS    - Loop Switching System
------- M -------
MAAP   - Maintenance And Admistration Panel
MCC    - Master Control Console
MCI    - Microwave Communications Incorperated
MDAS   - Magnetic Drum Auxiliary Sender
MDF    - Main Distrbuting Frame
MF     - Multi-Frequency
MFT    - Metallic Facility Frame
MILNET - MILitary NETwork
MTBF   - Mean Time Between Failure
MTR    - Magnetic Tape Recording
MTSO   - MoBile Telephone Switching Office
------- N -------
NBO    - Network Build Out
NCA    - Network Control Analysis
NOTIS  - Network Operator Trouble Information System
NPA    - Number Plan Area
NPDA   - Network Problem Determination Application
NPDN   - Nordic Public Data Network
NSN    - No Such Number
------- O -------
OCI    - Out of City Indicator
ODD    - Operator Distance Dialing
OIS    - Office Information System
OIU    - Office Interface Unit
ONI    - Operator Number Identification
OR     - Originating Register
OSI    - Open System Interconnection
OSS    - Operation Support System
OUTWATS- OUTward Wide Area Telephone Service
OW     - Order Wire
------- P -------
PABX   - Private Automatic Branch eXchange
PAM    - Pulse Amplification Modulation
PATROL - Program for Admistrative Traffic Reports On Line
PBX    - Private Branch Exchange
PC     - Primary Center
PCI    - Panel Call Indicator
PCM    - Pulse Code Modulation
PLTV   - Phone Line TeleVision
POS    - Point Of Sale
POTS   - Plain Old Telephone Service
PP     - Primary Point (or dial Post Pay payphone)
PPCS   - Person to Person, Collect, Special
PPM    - Pulse Postition Modulation
PPN    - Project Programmer Number
PSDS   - Public Switched Digital Service
PSW    - Public Switching netWork
PTT    - european Postal, Telephone, and Telegraph authorities
PVPR   - Packet Voice between Packet Radio
PWM    - Pulse Width Modulation
------- Q -------
QRSS   - Quasi-Random Signal Source
------- R -------
RACEP  - Random Access and Correlation for Extended Performance
RASC   - Residence Account Service Center
RC     - Regional Center
RCC    - Radio Common Carrier
RET    - Real Enough Time
RJE    - Remote Job Entry
RMATS  - Remote Maintenance Admistration and Traffic System
ROTL   - Remote Office Test Line
ROTS   - Rotary Out Trunks Selectors
RP     - Revertive Pulse
RQS    - Rate Quote System
RR     - Route Relay
RRO    - Rate and Route Operator
RSS    - Remote Switching System
RSU    - Remote Switching Unit
RT     - Real Time
RTA    - Remote Trunk Arrangement
RTAC   - Regional Technical Assistance Center
RU     - Receive Unit

------- S -------
SA     - Service Assistant
SAC    - Special Area Code
SAMA   - Step-by-step Automatic Message Accounting
SARTS  - Switched Access Remote Test System
SBS    - Skyline Business Systems
SC     - Sectional Center
SCAN   - Switched Circuit Automatic Network
SCC    - Switching Control Center (or Specialized Common Carriers
          or Satellite Communications Controller)
SCOTS  - Surveilance and Control Of Transmission Systems
SCPC   - Single Channel Per Carrier
SDCU   - Satellite Delay Compensation Unit
SDDS   - Switched Digital Data Service
SDLC   - Sychronous Data Link Control
SDM    - Space Division Multiplexing
SDX    - Satellite Data eXchange
SF     - Single Frequency
SLN    - Service Link Network
SNA    - Systems Network Architecture
SOTUS  - Sequentially Operated Teletypewriter Universal Selector
SPADE  - Simple channel Per Carrier Assignment by Demand Equipment
SPC    - Stored Program Control
SRCC   - Simplex Remote Communications Central
SSB    - Single Side Band
SSTDMA - Spacecraft Switched Time Div. Multiple Access(theoretical)
STP    - Signal Transfer Point
STS    - Space-Time-Space switching architecture
SV     - Source Vocoder
SXS    - Step-by-Step switching equipment
------- T -------
TAC    - Technical Assistance Center
TACACS - TAC Access Control System
TAP    - Technological American Party(or Tech. Assist. Program)
TASC   - Telecomaunications Alarm Surveillance and Control system
TASI   - Time Assignment Speech Interpolation
TC     - Toll Center (or TeleConferencing)
TCE    - Telephone Company Engineered
TCT    - Test and Code Treatment frame
TDD    - Telecommunications Device for the Deaf
TDM    - TanDeM (or Time Division Multiplexing)
TDMA/DA- Time Division Multiple Access / Demand Assignment
TDRS   - Traffic Recording System
TEARS  - Traffic Engineering for Automatic Route Selection
TELCO  - TELephone COmpany
TELSAM - TELephone Service Attitude Measurement
TG     - Trunk Guard
TGUE   - Trunk Group Usage Equipment
TLN    - Trunk Link Network
TLP    - Test Level Point
TM     - Terminal Management
TMS    - Time Multiplexed Switch
TN     - TeleNorm
TNDS   - Total Network Data System
TNOP   - Total Network Operations Plan
TOC    - Trunk Operating Center
TORC   - Traffic Overload Reroute Control
TP     - Toll Point
TPU    - Trunk Processing Unit
TS     - Time Sharing
TSI    - Time Slot Interchange
TSPS   - Traffic Service Position System
TTY    - TeleTYpewriter
TU     - Transmit Unit
TUR    - Traffic Usage Recorder
TWX    - TeletypeWriter network
------- U -------
UNICOM - UNiversal Integrated COMmunications system
USOC   - Uniform Service Order Code
USP    - Usage Sensitive Pricing
UT     - Universal Trunk
------- V -------
VAC    - Value Added Carrier
VAN    - Value Added Network
VF BSY - VeriFy BuSY
VMS    - Voice Message System
VMX    - Voice Message eXchange
VSS    - Voice Storage Service
------- W -------
WATS   - Wide Area Telephone Service
WC     - Wire Center
WO     - Work Order
WORD   - Work Order Record ard Details
------- X -------
XBAR   - crossBAR switching equipment
------- Y -------
YIPL   - Youth International Party Line
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