



Exploding The Phone

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Playing

A Tune

For A Number



Photos by Peter Paige

by Bill Jacques

When University of South Florida undergraduate students Mike Goodwin and Ken Cramer walked into the vacant phone booth just outside their dormitory they had only a dime. Mike, majoring in journalism, slid the shiny piece of currency through the provided slot, got a dial tone, and called the toll free 800 number of a major insurance company in New York.

As Mike was patiently dialing off the necessary digits, Ken pulled a small metallic box, no larger than an eight transistor portable AM radio out of the knapsack he carries with him constantly.

The compact piece of electronic equipment which Ken now holds in his hand is called a Blue Box. It is a multi-tone oscillator, which can produce all of the 13 once secret tone combinations needed to turn the world-wide telephone company into the hands of its possessor. On the face of the device are 12 buttons marked 1,2,3,4,5,6,7,8,9,0,KP, and ST. Each of these emits two tones at one time, much like the touch tone phones being used today, which, when manipulated

correctly, makes its possessor a cross country, trans-continental, overseas operator. On the top of the easy to build device is another button which emits a pure tone of 2600 cycles per second (cps).

As soon as Mike completes the call, Ken who is already holding the box close to the mouthpiece of the ordinary pay phone, pushes the 2600 cps button.

After a second the ringing stops and a slight clicking noise precedes a sharp momentary buzz. All of a sudden there is clean, white silence.

"It's cool," says Ken. "We've hit a trunk. Where would you like to go?"

Mike says he'd like to go to Switzerland. He has a girl friend in Geneva.

Ken slowly moves his finger down to the KP button on the lower left side of the cold metal face. The frequency combination of 1100 cps and 1700cps gets fed into the mouthpiece. He follows it with four other buttons: One, eight, two, and ST. All the tones are digested by the pay phone with an anti-climatic click-clunk.

"Right now we're hooked up to the international sender in White Plains," explains Ken. "There are seven of these senders which exist in the U.S. The others are in New York, Pittsburg, Jacksonville, Oakland, Denver, and Montreal. Each usually serves a different continent. White Plains services Europe."

"Do you want to go by satellite or cable?" asks Ken flauntingly.

"I'm scared of heights," Mike answers. "Let's go by cable."

"Now," Ken explains, "all we have to do to complete the call is punch out the country code, city code, and your chick's number."

"The country code is 41," Ken continues as he scans down a mimeographed sheet with a long list of countries with an individual number listed beside each. "So all I do is punch out KP 141, the area code 1 and dial up your chick. The KP stands for Key Punch. This tells our sender we are ready to feed it. The 1 before the country code of 41 tells it we want to go by cable. If we had



decided on air travel we'd punch the 0 before the country code to reserve a satellite. The last 1 before your chick's number tells Switzerland we want to land in Geneva. Once there we dial her number and . . ."

There is now a smooth constant ring emerging from the pay phone's receiver. Ken pockets his Blue Box and hands the call to Mike. Someone picks up the phone.

"Hello," comes a girl's voice.

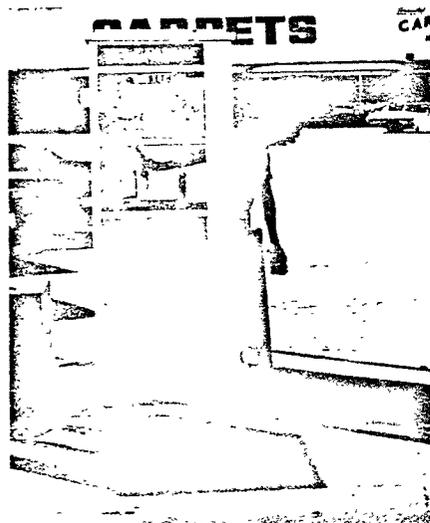
"Hello. Cathy?" asks Mike in a disbelieving manner.

"Mike!! How are you?"

The two talk for a little more than ten minutes. Mike tells her that he loves her but really must be getting off the phone. She understands and both hang up. A metal noise slides through the phone and hits the bottom with a mild cling. Mike pushes in the small shiny coin return compartment and gets his dime back.

"I'll buy your box," he says.

The whole thing started about 20 years ago when AT&T made a firm



commitment to operate it's long distance switching system on 12 different combinations of six master tones. When blended together, two of these electronically generated master tones produce a certain beat frequency.

For instance, to get the long distance switching tone for the number 8 you combine 900 cycles per second with 1500 cycles per second. If you wanted the beat frequency for 7 you would couple 700 cycles per second with 1500 cycles per second. These and the other ten combinations were supposed to be kept in the strictest secrecy. But a few years ago a Bell Telephone Laboratories engineer was careless enough to list them in an article he had written for *The Bell Systems Technical Journal*. That article, entitled "Multifrequency Signaling Systems", was soon red tagged and pulled off the shelves. But not before a few innovative phone phreaks acquired this valuable frequency data.

Once this information leaked, the ability to build a tone machine capable of mimicking Ma Bell's own equipment was within the range of any teenage kid in America. Even if the



experimenting person didn't have the talent or schematics to construct an accurate tone generator, he could simply tape the required tones on a cassette tape player from an electron organ. Example: playing F5 and F#6 will give you the multitone frequency for the number 3, (roughly 900 cycles per second and 1100 cycles per second).

A stable instrument like the Hammond B3 or C3 is preferred by most phone phreaks since, when it's highest drawbar is pulled out, it will easily reproduce the frequencies well within one per cent accuracy. Ma Bell's variation allotment on some equipment occasionally will be as high as 30 cycles per second.

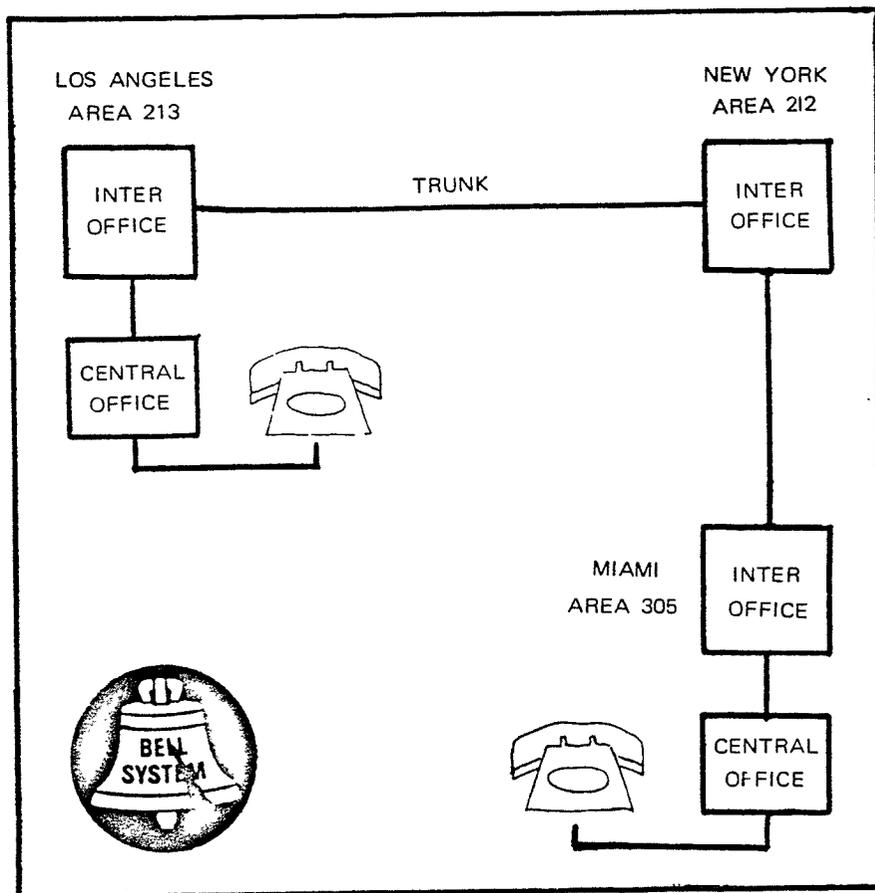
Soon phone phreaks, equipped with their homemade multi-frequency generators, the world over were ringing each other up and fanatically trading technical information. Blue box arrest rates around the country began to rise confirming the expanding underground telephone network's existence. Thousands of electronic parasites were flauntingly swimming through Ma Bell's bloodstream.

Ma Bell switches all her calls through two types of offices. All local calls go to the neighborhood Central Office where it is switched to the nearby local line you are dialing. But if you dial 1 before the number to indicate long distance, your Central Office pushes your call up to the area's Inter Office. This Inter Office connects different Central Offices together and routes your call to another Inter Office in the area you are attempting to reach. Once there, your call is translated and advanced to the dialed area's Central Office. Finally, the Central Office dialed rings up the number you want.

The way the Inter Office finds an unused inter toll line, or "Trunk", to shoot its signal the long distance with another one of Ma's tones. If a Trunk is idle, it will whistle a pure 2600 cycles per second to the searching Inter Office. This tells the Inter Office that it is neither sending nor receiving any signal and is free to be used. So when your Inter Office goes looking for an un-occupied Trunk it simply picks one that is whistling. Once a Trunk is "seized", the whistle stops at both ends of the multifrequencies are beeped through to the Inter Office in the area you are calling. So if a Trunk is not whistling, the Inter Office is either preparing to receive instructions or sending them. It all depends which end you're on.

Let's say you want to make a free call from Miami to Los Angeles. First, you dial an 800 number of a major credit card company which might happen to have its headquarters in New York. Your Miami Inter Office finds a whistling Trunk line to New York and seizes it. New York notices the tell-tale silence and awaits the multifrequency tones which are expected to be shot up from Miami. When the multifrequency tones reach New York they are converted and ring the 800 number.

All this time an accounting tape in your Central Office is recording the



number you dialed and the time you dialed the call.

But just as the New York 800 number starts ringing you hold your box up to the mouthpiece and pump 2600 cycles per second into it. The tone shoots all the way to New York where the big city's Inter Office notices it and, because the Trunk is whistling again, assumes that you have hung up and the Trunk is idle again. The New York Inter Office thus stops ringing the 800 number. But that tone only lasts for a brief second and after the Blue Box operator lifts his finger off the 2600 cycles per second button the Trunk falls silent once again. Now the Inter Office in New York awaits new routing instructions from the silent Trunk line, only this time you are its master.

So you beep off the area code for Los Angeles (213) followed by the number you want to reach. All this time your Central Office accounting system still believes you are ringing the toll free

800 number in New York. At last your party in Los Angeles answers and the Central Office in your area makes a mark on its automatic accounting tape that you have reached a toll free number in New York. After you finish talking that same automatic accounting system records the time you hung up, but the rate is zero ¢ per minute since, as far as the automatic accounting system is concerned, you have been talking on an 800 line.

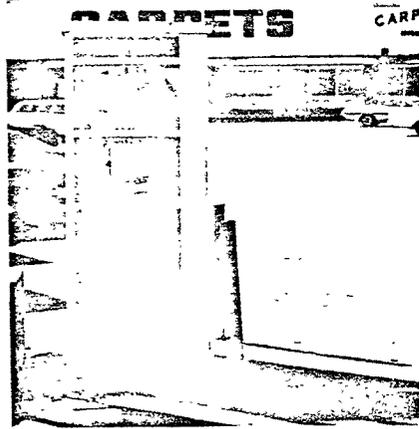
To put the situation lightly, Ma Bell is very concerned. Before this point, the advancing progress of the people's technology was always outrun by the Bell Company. An excellent example concerns the history of the pay phone.

Being the most victimized of all of Ma's equipment, the once susceptible piece of equipment has now been refined to the point of near immunity to vandalism by resembling an armored fortress. A metal cable is now



wrapped around the receiver wire to eliminate the illegal registering of quarters by sticking a pin through the wire, stripping bare the insulation so that the current rubs against the pin, and touching the top of the once shiny coin slot each time the operator would request twenty-five cents. AT&T foiled yet another classic art when the monopolistic giant replaced the "push-in" coin return button with a pull-down lever. Before the evolutionary step was implemented, one could drop a nickle in the slot, smash the coin return button as the coin fell, and get a dial tone for half price.

Even though most professional phone phreaks do occasionally manipulate the mechanics of the modern pay phone, almost all of them find it easier and more rewarding to jump around the world and bounce off satellites. And once the concept is mastered, a phone phreak only has to produce the necessary tones. In other words, the phreaks are digging it much more to walk into a phone booth with a dime store slide whistle, blow themselves across the sea, and get their dime back than to enter with a screwdriver and dial a local number for free after devoting precious time to some mechanical revisionment of the



instrument. A cop can easily arrest you for unscrewing a phone wire, but few will ever expect anything with a slide whistle. for unscrewing a phone wire, but few will ever expect anything with a slide whistle.

The way the tones leaked out through Ma Bell's own publication was only the beginning of a nightmarish mistake that will probably haunt her for many years to come.

Ma Bell further catalized the underground information distribution exposing a blind college student by the name of Joe Engressia. Back in 1968, the University of South Florida nineteen-year-old was mass mediaized because of his extracurricular activity of whistling off free long distance calls for fellow students. After the student who was born with perfect pitch was warned and disciplined by the college, he made headlines in magazines and newspapers nationwide. Soon, Engressia began to receive calls from phreaks around the country and united the once scattered community of public utility experimenters into a mutual comradery.

Since then, phone phreaking has been enjoying the fruits of national publicity. A well-researched feature



outlining the history of the movement was published in Esquire's October, 1971 issue and underground publications have been relaying progress of the group's constant battle with AT&T to their readers.

One battle from which Ma Bell emerged ultimate victor involved a recently convicted phone phreak named John Thomas Draper. Known to his technical accomplices as Captain Crunch, Draper, (who acquired his alias when he discovered that the toy whistles once provided in the children's breakfast cereal emitted a true 2600 cycles per second tone), was charged to have beeped his way to an Australian top-40 radio station illegally. For a call that would have normally cost him - around \$9.95 Draper was fined \$1,000 and put on 5 years probation by a federal court in California.

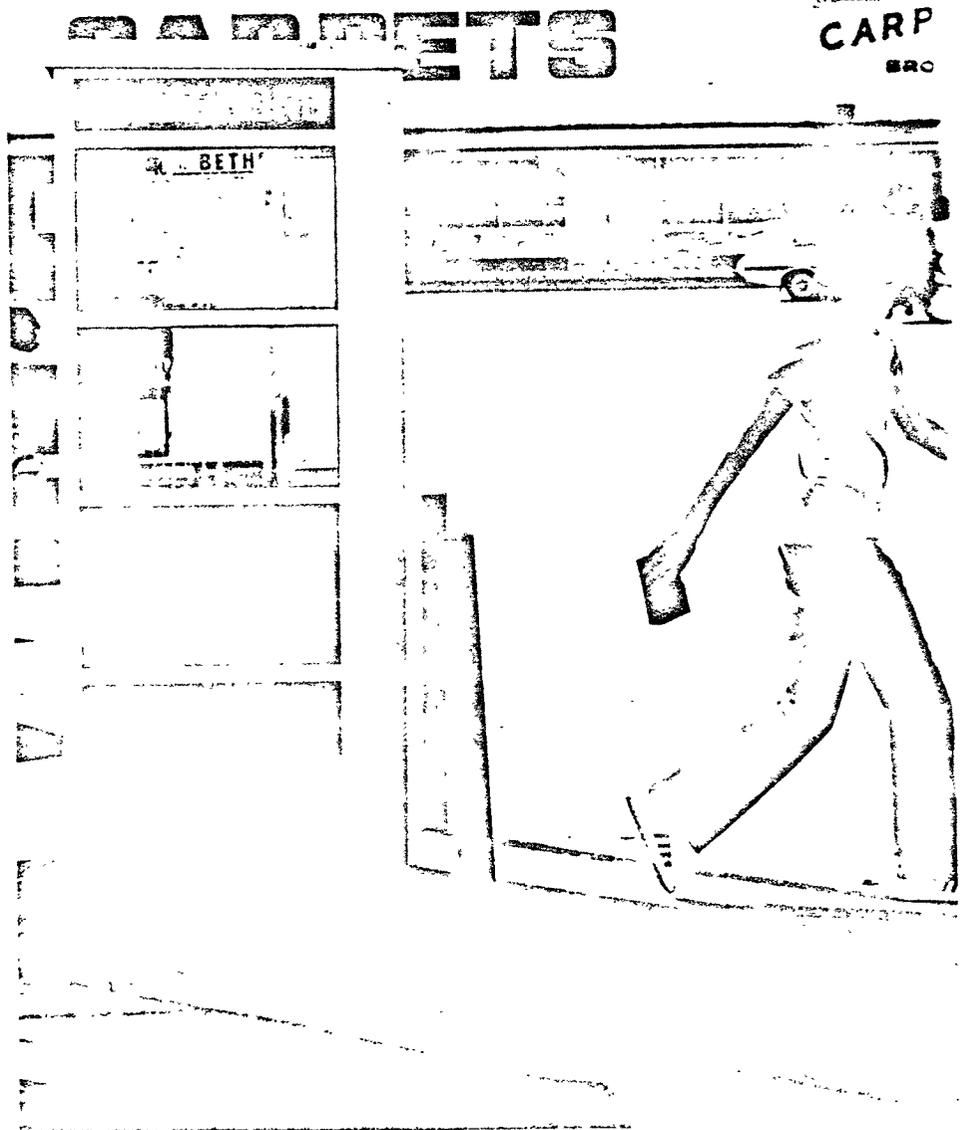
Another point was scored by AT&T when they confronted Ramparts magazine in late 1971.

"Within a week, American Telephone and Telegraph had achieved what the CIA, Pentagon, FBI, and other targets of Ramparts over the last ten years couldn't bring about: the nationwide suppression of this magazine."

So read the July editorial in the 1972 issue of Ramparts, explaining to it's readers why they hadn't the chance to see the previous month's issue.. The June issue of the California based periodical included some simple, easy instructions on building and operating a device which allows it's controller to recieve incomming phone calls from anywhere without charge to the dialing customer. Known as a "Black Box" in phone phreak vocabulary, the simple signal muting device requires only four dollars of readily available electrical parts, a screwdriver, a kitchen knife, and three to four hours of spare time to build once equiped with Ramparts 4 pages of easy-to-follow illustrated construction instructions.

The Black Box that Ramparts diagrammed for it's readers is basically a mute device which amounts to two straight forward alterations of the signals on two simple circuits. When you receive a phone call and pick up your receiver a signal is sent from your phone to the callers Central Office starting the automatic billing machine in his area. When you hang up, the current stops, and so does the automatic billing machine. The Ramparts Black Box surpresses that triggering current from ever reaching the callers automatic billing machine. So according to the phone company, the number is still ringing when you are actually enjoying an otherwise expensive long distance conversation. Ramparts carefully and specifically explained the operating instructions and concept behind the box while additionally cautioning the reader of it's illegality.

The only people who ever received that issue were it's subscribers, (among them the BCC library), and Ma Bell didn't let them go unnoticed. "Knowing that the subscriber's copies of the magazine had already been mailed out," continues the editorial. "They requested a copy of our confidential subscriber list so that they could place those who had received



the June issue under surveillance, and that we respond with a 'No Comment' when other members of the press called to ask why AT&T had confiscated our magazines."

But once again Ma Bell may have done herself more harm than good. The editors of the nationwide monthly have become so outraged that they are "establishing a war chest to regulate AT&T journalistically by revealing the ways in which it cheats and defrauds its captive customers who are forced to rely on its systems."

Already, the contributions are coming in.

Last July 29th, phone phreaks from all across the nation migrated to the Basement Ballroom of New York's lavish Hotel Diplomat to take part in Youth International Party Line's Phirst Phone Phreak Convention. YIPL, which is a self-proclaimed anti-profit organization, was originally supposed to hold its gala gathering in Miami during the Democratic Convention, but postponed it, and moved it to the massive metropolis where organizers claimed, "the laws against phreaking are full of loopholes."

Workshops were held concerning circuits, legal hassles, and the general strategies of Ma Bell. Master of ceremonies, Al Bell, distributed mimeographed sheets containing instructions on how to build a Black Box "simpler than the one described

in the June issue of Ramparts." The Blue Box workshop leader displayed charts of several different circuits familiar to the most famous of all phone phreak devices and recommended a book by David Talley called *Basic Telephone Switching Systems*.

But some of the most interesting information was the coming attraction hints for what was about to be published through YIPL's upcoming newsletters. For well over a year now, YIPL (operating out of room 504, 152 West 42 St., NY, NY.) has been the phone phreaks' official disseminating outlet for new information, schematics, and general correspondence. Yippie PR man Abbie Hoffman, who was an active participant at the convention, said that future YIPL newsletters would soon feature circuits for scramblers, bug detectors, and a new device (which consists of an oscillator of 2.2 KC, switched on and off electronically, just like a single slot pay phone) called a "Red Box."

After commemorating the first transcontinental telephone line between New York and San Francisco, on July 29th 1914, the assemblage ended the convention by re-running a 20 minute black and white celluloid film feature which displayed pay phone phreaking techniques and included a ten minute portion on a guy who expresses his hatred of the phone company by eating Ma Bell equipment.

YIPL's August letter says that several "undercover agents from the Phone Kompany" showed up, and advertised that the now infamous 20 minute flick is available for rent. But of more importance are the schematics and plans contained within the small yellow August newsletter. Complete information on the construction, tuning, and operation of a Blue Box ±

"Line earpiece with foam, and press it to the mouthpiece tightly," part of the operating instructions direct. "The smartest phone phreaks seldom carry their unit with them, but rather a cassette recorder, which they erase after making their call."

Also included in the August issue are the addresses of companies that sell the needed parts and recommendations of certain brand names that have presumably performed well for phone phreaks in the past.

Even Telephony, the magazine of the Telephone Industry, reportedly plugged YIPL's New York address for company executives, (advising them not to reveal their new identities when writing YIPL). YIPL answered the article, which they claim is biased, with "finger upheld" and congratulated the trade magazine on "the ridiculous accuracy of their name."

All names, places, and events in this article are completely fictitious. Any similarity whatsoever is completely unintentional.