NEW YEAR '75

MODERN PHONE PHREAKING:
More sophisticated yet more vulnerable

DETECTION:
How to avoid it

TOLL:
A general introduction

CONSTRUCTION PROJECT:
The Hold Button

AREA CODE 900:
It's more than a mass calling number

PLUS: Reader Response Code & Test Numbers
Telephone Electronics Line will accept payment by check, money order, postage, cash, domestic or foreign. Due to the present size of our circulation and operating procedures, we will be unable to bill you. Therefore, full payment must accompany subscription order which is refundable if not fully satisfied. Make all documents payable to TEL for $6.00 in the U.S. and for $8.00 in Canada and all other countries.

We continue to grow with your support. In fact, we'll be expanding in volume 33% by next issue. In addition, you will enjoy following the multi-color diagrams, and larger cleaner type. We ask that you become an agent for TEL and sell a subscription to someone you know!

Wishes You A

Happy New Year.

NAME ________________________________

ADDRESS ________________________________________

CITY ____________________ STATE ______ ZIP ____________

Page 2
Commercial Telephone Service (CTS) is a new concept which
works very much in the same manner that television in
America does. (As far as basic format is concerned). There
are numerous opinions involved—both pro and con—however,
at the present time, little has been done to design or develop
such a system.

Imagine if CTS were employed in your city. There would be
no telephone installation charges, repair charges, or toll
charges. If CTS were employed nationwide, there would be
plenty of free unlimited communication for all. Every tele-
phone call would have an announcement that would “appear”
on the conversation, sponsored by a local merchant. Your
local calls would have local announcements, while toll or
long-distance calls might be sponsored by National Airlines
or Coca Cola.

Sound absurd? Not really. This concept has probably been
employed by small telephone companies in the past, without
much success probably due to a lack of interest with larger com-
panies. If you ever watch American television, you will find
that most stations are sponsored by commercials every five
or ten minutes. Depending on the station and the viewer,
programs sponsored by these merchants may range from
very entertaining and amusing to extremely dull and frustrat-
ing. Personally, I find most television shows are a waste
of time and very non-educational. The so-called “specials”
are the only worthwhile programs to view. (This is not an
endorsement to degrade America’s television and is not
intended to do so).

On the other hand, the commercials may very well be an-
other story. They inform the television viewer on current
product availability and economic situations. They demon-
strate advertising techniques and consumer gullibility. In
addition, they bore the hell out of some sucker souls who
try to watch the programs between commercials.

Now, if advertising were employed in the telephone industry
as presently done with television, what effects would there
be on the consumer and what changes would be made in the
system?

In the first place, the consumer is already blessed with
commercials on television. Why would it be so difficult to
accept the idea of commercials on the telephone? In addi-
tion, there would be no invasion of privacy on the conversa-
tion since the advertisement would be a recorded announce-
ment played through individual couplers into each line separately.
In addition, many different announcements (one recorded
right after the previous one) on a continuous tape loop
would be used, preventing the same message from being
played over and over again.

The mechanical workings of such a system would not be
difficult to employ. One idea would consist of the following:
Every subscriber line would have a step-up transformer
coupled to the Tip and Ring terminals—the two wires which
constitute a telephone line. This will permit low-level audio
signals from the announcement machine to be stepped-up to
a higher voltage and placed across the line. Since the tele-
phone line is currently limited, a high voltage signal will pro-
duce a loud, clear audio transmission. It will also step-down
signals that the subscriber produces, such as conversation
or Touch Tone signals, traveling in opposite direction
(coming from the line and going into the announcement
machine) to a level where it will be lost in the transformers.
Although to a certain extent, this would be impossible accord-
ing to formulas and theory, practical limitations will permit
this type of setup to work. Many audiophiles will testify to
this when they find that their high-fidelity amplifier has a
reduced bass response and a lack of treble. The blame:
their amplifier uses transformers which provide a lack of
efficient coupling, and consequently, have a loss in trans-
mission.

Therefore, we learn that transformers placed across every
subscriber line will couple the line to the announcement
machine with good results. It will also block signals creep-
ing back into the system and isolate the lines from them-
selves where no crosstalk or backtalk will be heard.

Two modifications that might prove to be advantageous are:
1) Using individual amplifiers on each line instead of trans-
formers where cost is not a factor. This will provide
maximum coupling and individual gain and output control for
varied subscriber loop lengths. 2) Using either the trans-
formers or amplifiers on line-link or trunk-link circuits,
instead of on each subscriber line. This too, is a cost
factor which must be taken into consideration. It would
be more efficient to have one coupling device on each line
link or trunk-link link rather than on each subscriber line. Since
the line-link or trunk-link circuits link calling parties to
called parties, when all of these circuits are busy, there
would be no facilities to connect anyone together anyway. By
placing the couplers to these circuits, the announcement
will go to the actual connection rather than wait on a vacant
subscriber line until someone uses the phone.

There are a few limitations that CTS would introduce into
the industry. Probably the most noticeable of these would put
many keypunch operators out of a good job. The only billing
that would be necessary is to the few advertisers who are
having their announcements played on the lines. The tele-
phone company has equipment which already calculates trunk
usage for various and load-balance purposes. This
same equipment could be used to base advertising rates. In
addition, the postage that would be saved by sending at least
one First Class piece of mail to each customer each month
would total a considerable fortune.

Statistically, if the telephone companies were set up for CTS
in the first place, based on present operating costs, there
would be no more of a financial burden in operating this
system than our old subscriber billing system. Again, this
calculation would be derived from current expenditures on
the existing system and those predicted in CTS. No actual
figures will be released in this case since this is a hypo-
thetical situation. However, it is relative to any workable
telephone network, and might be interesting to see such a
system in operation.

January 1975

Page 3
In recent issues, Traffic Service Position Systems have been explored and outlined in great detail.

Now, I will attempt to outline the operations of the toll operating offices.

The physical layout of the board is best explained by referring to Vol. 1, No. 1 of TEL (Nov. '74). A picture within that article depicts the toll board quite accurately. On each toll board, there are rows upon rows of jacks. These are called "strips" and are identified by their purpose such as a 34 tandem strip, a directory assistance strip, a no test strip, etc. The strips are physically identified on the board by small paper strips covered with plastic in special laid strip holders directly above the actual jack bank. They are usually color-coded as to purpose, priority, and actual function. There are also small light indicators between label strips and jack banks in the form of round lights and bar lights. These lights are usually used for long-distance purposes. These lights, in the form of thin vertical strips over each individual numbered trunk, are computer-controlled to indicate which trunks are available for use. An operator will plug her cord into a lighted trunk before trying an unlighted circuit.

The other lights are round and usually used on incoming trunk circuits, such as coin, residential, etc. They light whenever someone picks up his phone and dials the operator. These lights are usually white.

The operator has a series of cords on her board for plugging traffic and verification purposes. Each cord "set" consists of a front cord, a back cord, and two lights to indicate call status for whatever circuit that particular cord "set" is plugged into. Typically, an operators board would have 20 such sets. For identification purposes, each cord set is marked by color. From the left, the first cord set would be coded with silver cords, white plugs, and white indicator lights. The subsequent set would have red cords, red plugs, and red indicator lights. The cords are long enough to stretch easily to the farthest trunk and weighted with a special pulley arrangement to allow easy and fast retraction. The cord set, in idle position, rests with both plugs straight up. The holes for the cords are only large enough to accommodate the cord itself. The plugs rest snugly against the smaller hole, held by the weight arrangement. Additionally each cord set is provided with 2 or 3 keys, of double pole, double throw on-off switches, used for applying ringing voltage to the front or back cords, applying talk voltage, or opening the circuit to the MF key unit for dialing on the front or back cord. Each operator is also provided with a special multiplicity key, which dials on trunk circuits in a method similar to our touch tone dials.

When a residential customer dials operator, a light goes on all the toll boards, on the incoming toll strip, which is identified further by a small strip denoting the first 3 digits of the customer calling such as 870, 876. An operator who is not actively engaged in a call will take her back cord and plug it into the lighted jack. While the customer waits for the operator, an audible ring-tone is sent to the customer to tell him that his call is going through.

When the operator plugs in, the light goes out on the board and the light representing the back cord stays off, while the light for the front cord goes on. The customers phone is off the hook, while the front cord is still hung-up, it isn't connected. The light is on when the phone is on the hook, off when it is off the hook.

After she plugs in, the operator will flip a key that applies talk voltage through that circuit to her headset apparatus. When the operator answers, the customer specifies the type of call or assistance needed and the operator responds accordingly.

A typical situation is: a customer claims that he has dialed a long-distance number 4 or 5 times and cannot reach the party. The operator asks for the number he is calling and the party he is calling from. She writes this information on a traffic routing ticket. Since the tickets are read electronically into billing computers at special billing centers, the operator will also mark "odd" which means he will be charged for a direct distance call. She locates the appropriate trunk strip, and a trunk marked by a thin vertical light indicator, and plugs her front cord into that circuit. Then she turns on the MF activation key, which opens a circuit from that particular cord set to the MF key unit, and depresses the KP key. A light marked ST lights to indicate that further keying can be initiated. The operator then depresses numbered keys on the MF unit, dialing the number as we do on touch tone. After she completes the ten digits she depresses the key marked ST which initiates completion of call on the far end. The light on the keying unit (ST) will go out. The light on the cord set for the front cord will stay lighted until the far end answers and then supervises (reverses). If the number called is a special telephone company number, or is muted, the light will stay lighted even though the ringback tone is stopped, the call answered, and conversation is going on. Operators call a line that has supervised "dark supervision" and a non-reversed line or a still unanswered number "light supervision". The operator in a normal reversed call will note when her front light goes out (to indicate call completion) and pull her special timer lever on her calculating timer mechanism which marks the time at present on the ticket, and proceeds to another call.

On 3rd party calls (calls billed to a 3rd number) the operator, after dialing the required number will call that third number to obtain billing verification. If that number is busy she will write "BY-3" on her ticket. If that number rings, but does not answer she will put "DA3" on the ticket. If it is the same number, she will tell him the circumstances, and try to arrange for another type of billing. If the customer is using a fraudulent name or number, she will charge the called party. If calls are billed to a 3rd number, and it is done fraudulently, that person can complain to the "Rep", who will have special agents investigate the billing. The method of investigation is to call the Customer Name And Address Bureau Office associated with the customer calling area and obtain the parties name and address. The operator then dials the 3rd party's number, and if the number dialed is the same as the 3rd party's number, then the 3rd party is charged for the call. If the number dialed is not the 3rd party's number, then the 3rd party is not charged for the call. If the 3rd party does not accept the billing, then the operator will write "V-3" on the ticket and proceed to another call.
The intricacy of CREDIT CARD FRAUD

Due to the recent reader response, I have decided to write an article about an important facet in the telephone system by which you can do as well as observe. Namely: CREDIT CARD FRAUD.

The title, "CREDIT CARD FRAUD" is used to indicate that misusing credit cards for fraudulent purposes is illegal, a violation of section 502.7 of the California State Penal Code. I do not recommend that you use them, nor do I condone their usage. In these lines, I have omitted actual credit card numbers, but have included the actual code used, None of the credit card numbers printed here are real—all are fictitious.

Pictured in the above illustration is an example of a typical credit card. Note the position of the name as opposed to the 10 digit code above. I have found that posting a cut-out of this card (above) on cardboard is a good reference, and carrying it in my wallet even a quicker guide to the right answer. Note the use of the code above. The code consists of the following elements: the 7-digit telephone number of John E Doe + a Revenue Accounting Office (RAO) code, determined by John Doe's home area code and first 3 digits of his telephone number. The RAO code currently runs from 001 to 599—only the middle 4 digits of the 10-digit code are used as check digits. EXAMPLE: 784-0053-066 R, 0053 as 4th, 5th, 6th, 7th.

We know that RAO codes go from 001 to 599—not below or above. Only the middle 4 digits of the 10-digit code are used as check digits. EXAMPLE: 784-0053-066 R, 0053 as 4th, 5th, 6th, 7th.

Try now, to break the code. If you can establish a formula or equation, send it in to us and we will test it to determine its validity. We also will be working on the trying to bring you more and more of your telephone companies secrets.

Good luck on your new project. I would suggest that you collect as many good ones as you can, using them at remote pay-places. Advise friends to whom you speak of the method of communication and alert him to head off investigations confronting him concerning illegal communications by the company.

Any information, additions, or corrections would be appreciated. When writing, please refer to the volume number and # of the TEL issue, as well as the article's name.

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Coming Next Month:

- Tone Boxes (Blue & Red)
- DDD Overseas
- Answering Machine Survey
- Telephone Systems
- Dial Speed Measuring
- Phone Booth Special

January 1975
By Donald Simmons

Modern Phone Phreaking

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DETECTION continued from page 7
detection equipment. In Crossbar 5 offices and 4A toll centers, the trouble recording equipment consists of an elaborate sensory network of wires and relays associated with all common control equipment in the office. This network is linked to a diagnostic device which punches appropriate holes in an IBM card to indicate to the switchman or office attendant the location and nature of the problem. In electronic switching offices (ESS, EAX, etc.) the central computer which controls all switching in the office is equipped with diagnostic subroutines which constantly check for various trouble conditions.

All of this weighs heavily against those who make fraudulent calls. In ESS offices, clearing a trunk (clear forward with 2600 Hz causes the teleprinter in the office to print out a “spot reversal” indication about that line. In addition, it prints out the calling number as well as the called number. When noticed by a switchman this spells out trouble. In some 4A and 4M TDLL centers the equipment looks for this “spot reversal” condition on its trunks. Also indicated is the incoming trunk number which can be traced back by calling the originating office or checking toll records at a later date.

If you box from your home phone, the inevitable result is that you will eventually be detected.

The safest way to Blue Box is from a pay telephone. When doing this, it is suggested to pick your pay telephones on a random basis. Do not make calls from an isolated neighborhood in which you live. Some unfortunate Phone Phreaks who frequent a specific group of pay phones have been nailed by stake-out of FBI agents.

When you box from the pay phone, assume that the conversation is not private. If you happen to be detected by a Tel. Co. Switchman, he may trace the call and notify security to come and apprehend you. This is a combersome process, however, and it usually takes more than 30 minutes.

Beware that a recent law permits the Phone Company to use 60 seconds of tape-recorded conversation without your knowledge or permission in court if used as evidence in your conviction. Both parties may be convicted on an equal basis if both parties were aware that they were involved and the cause of avoiding lawful toll charges.
TEL Tips From the reader

STOP THOSE CRANK CALLERS

Build a beeper box to emit a duplicate of the Telephone Phone recording beep. That is it. People freeze up when they think they are being recorded, especially storm window salesmen. Once they are off they may be easy to lock out play with them and get them off your line. This is much more economical than actually recording and a lot more fun.

HOW TO MAKE YOUR OWN JACKS

Recently many phone companies switched from a square receptacle to a round receptacle for terminals and jacks. At the present time any that will fit the new round boxes are almost impossible to find. There is a way however, to make your own jacks.

First, obtain a round cover plate and metal ring. These can be obtained from your repairman or from Bell or other companies that make these jacks. Then the center is cut or drilled out with a hole saw. Make sure you are flush with anchors and wall surface before installing the ring. Now you are ready to mount the cover plate, terminal or jack.

The jack itself is made by drilling four appropriately spaced holes in the plastic cover plate. You may have to buy a surface mounted model to use as a template. Be sure that you have the correct holes on top of the plastic jack. Remember, this is a plastic cover plate. If you have a floor jack the anchors can be flush with the wall surface before installing the ring. Now you are ready to mount the cover plate, terminal or jack.

Next manufacture the contacts by winding a long spring. Use a second spring but make it smaller. This will not protrude past the cover plate. It will be used to hold the contacts in place. Make sure the contacts are flush with the wall surface before installing the ring. Now you are ready to mount the cover plate, terminal or jack.

Remember a little precaution is better than a large chargeback and possible loss of service.

OPERATOR-May I have the Area Code for...

The next time you have nothing to do you can call your friendly "O" operator and ask for the area code of the nearest post office. All of these exist and the Telephone Company has an area code for each one.

Georgia

Florida

California

Arp

Bell

Agnew

Ball Ground

Belle Glade

Angels Camp

Camp Dixie

Camp E-chock-o-tree

Azuka

Chickamauga

Chose

Ben Hur

Climax

Coca

Bowles

Dial

Fruitland

Brawley

Dry Pond

Fruitville

Butte City

Experiment

Geneva

Earp

Fairfield

Holiday

Happy Camp

Fris

Kissimmee

Lucern

Gay

Little Torch Key

Mecca

Good Hope

Old Town

Nice

Leco

Plant City

Nice

Meansville

St. Cloud

Olive

Pills

State Prison Farm

Perris

Social Circle

Sugarloaf Key

Pollock Pines

Temperance

Titusville

Railroad Flat

To T. Y.

To the island

Tranquility

Zenith

Venice

Volcano

Try not to get your fish and your fry or your fruitville and your fruitland confused.

January 1975

TOLL continued from page 4

TOLL continues from page 4

Try not to get your fish and your fry or your fruitville and your fruitland confused.

January 1975

Back Issues are available for $1.00 each. Un-

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rewritten, untouched, original copy sent by first class mail in a manila envelope. Specify Nov. (TSSF) or Dec. (Toll fraud) copy.
Construction Project

THE HOLD BUTTON

INTRODUCTION

Have you ever attempted to run across the house and answer the extension phone before the calling party disconnects. This will unavoidably happen when someone calls, you answer the phone, and wish to speak on another phone in the privacy of your own bedroom. You have a choice of telling the calling party to hold on while you dash across the house and answer the extension and dash back to hang-up the first phone and dash a third time to speak with your party. Or, you can hang up the first phone and dash just once to the extension phone and answer it within fifteen seconds. (Most phone companies provide the called party with fifteen seconds of "reset" or "time-out" time after the phone is answered. Therefore you will probably notice that you can "hang-up" on your friend for as long as fifteen seconds and he will still be at the other end when you answer again). This can, at times, be very annoying if you have a large home and your extension phone is in the tree house out back. In addition, if you have an office with the same problem, it would be a poor idea to go darting and dodging through the corridors to answer the other phone all out of breath, hoping your client is still on the line!

SOLUTION: Call up your local telephone company business office and request a key-phone installation with hold features. Of course, you will want lamps that indicate who is on hold. The approximate time for such an installation to be ordered and installed may be as much as three or four weeks.

ANOTHER SOLUTION: Build one yourself. It will provide you with four accomplishments: a savings in time, a savings in cost, a knowledge of the telephone system, and the personal satisfaction you will get from doing it yourself. Not to mention committing Ma Bell to learn what key-installers take a trainee course for six months to learn, in one eventing, and you will have the ambition to go on to bigger and better things.

CIRCUIT DESIGN

Consider the telephone circuit. The telephone is connected to the line by two conductors:

If you were to have a hold button in the circuit, it would look like this:

This type of hold circuit is by far, the simplest and easiest to install. It will put the party on hold when the switch is closed and take the party off hold when the switch is open.

ITS DISADVANTAGE: You cannot operate the hold button from a remote location. You must have a hold button at every location you wish to activate the hold from. And all hold switches must be turned off to take a party off hold. This means that you must run around the house flipping all the hold switches that are on, to the "off" position in order to hang up and dial another number. This is the disadvantage that this particular hold button has, and may be corrected by employing the following circuit:

This circuit works on the principle that the 48 volts normally found on the telephone line will hold the relay down, thus holding the line, until the telephone instrument is answered, consequently robbing the relay circuit from sufficient power to be held down. It's a simple circuit and found to be quite effective. A separate hold may be installed at every location where holding features are required. One thing to remember: this type of hold operates on a voltage-sensitive system. (i.e. the voltage drop across the line when the telephone becomes off-hook and requires more power is insufficient to keep the hold relay down). Consequently, if there are excessive loads present on the line, or if too many holds are activated on the same line at once, the hold relay(s) will open.

If the party that calls you is placed on hold, becomes impatient and hangs up, the hold relay will turn off automatically fifteen seconds after the calling party hangs up. Your telephone will be in a normal condition ready for standard operation. If lamps are desired to indicate when a party is on hold, the following circuit will provide this option:

Be sure that a lamp requiring very minimal current is chosen, as this too is a factor in determining relay sensitivity. Another option includes blinking lamps. There are many methods used to produce this visual signal. The Phone Company uses a device known as an interrupter. The interrupter is an electromechanical device operated by a motor which turnscams that activate relay switches. The interrupter contacts would be wired in series with the lamp.

PARTS LIST

The basic parts that are required to build the hold button are a relay, a pushbutton switch, and a lamp.

The relay may vary from the standard 600 Ohm telephone-type relay. This is due to your location from the central office and various line loads on your telephone line. You must experiment with different types of relays and try placing a potentiometer in series with the relay coil to adjust sensitivity. Probably most often, a 600 Ohm relay at 24 volts will do the job. Again, try experimenting with different relays until a satisfactory one is found. (A Radio Shack "Relay Suprise Pack", for example, is an excellent source of relays).

The pushbutton switch may be an SPST, momentary type. The lamp may be any value, as long as relay operation is not affected. Usually, 2-3 volt, 50ma is sufficient.

APPROXIMATE CONSTRUCTION TIME: One hour.

APPROXIMATE CONSTRUCTION COST: $5.00.
now available for the telephone experimenter

COMPLETE CONSTRUCTION PLANS

TELEPHONE PLANS: $3.00 each.

Answering Device
Automatically answers the ringing line, plays a pre-recorded announcement, takes the calling party's message, and hangs up.

"Black Box"
Device that the FBI uses to wiretap and monitor telephone conversations silently, from a remote location from the phone.

Call Limiter
Stop those long-distance calls made by your friends! Device disconnects all long-distance calls from your telephone line.

Central Dial Exchange
Now you can call the other end of your house on your private telephone system. Great for the office without a PBX system.

Recorder-Actuator
Now you have the capability of recording telephone conversations automatically every time the phone is in use.

Schematics
The basic schematics and parts lists for commonly used telephones. Includes a description of the telephone network.

Teleslink Burgler Alarm
Use the telephone line as a link to notify you when intrusion occurs. Great for babysitting purposes and remote applications.

ELECTRONIC PLANS: $5.00 each.

Biofeedback Conditioner
Monitor the fluctuations that your brain produces and learn to put yourself in any mood desired. Completely harmless.

Multifrequency Encoder Network
Control over telephone line from this pocket-size unit. Learn to manipulate your telephone and speed calling rates by 500%.

Dodecahedron Speaker Enclosure $7.50.
Unique twelve-sided enclosure enhances response from any speaker. Unusual design adds to any home decor. A must for the audiophile and design engineer.

Horticulture Stimulator
Stimulate plant growth as much as 300%. Can be used on a particular section of the plant or on the entire plant itself.

MISC. PLANS:

Photographic Pinhole Camera $3.00.
Small, compact, easy to build camera costs only the price of the film cartridge. Plan includes proper exposure setting tables and film types that produce best results.

THE LEGAL ASPECTS OF INTERCONNECTION

The complete reference book on the legal rights of the telephone customer. $29.95, postpaid.

This book is still in the production stage and will include the latest laws and regulations up to and including the end of February. Know exactly when and where the telephone company has the right to enter your home to inspect their lines. Know exactly what illegal telephone equipment consists of and when it is actually considered illegal. Know exactly what YOU, the telephone customer, may do to fight back at the phone company should there be any question in your service. In addition, technical aspects of the law will be discussed. This material has not been published in TEL.

ALL OF THE CONSTRUCTION PLANS ABOVE ARE AVAILABLE FOR $24.95. WITH "LEGAL ASPECTS" BOOK, $34.95.

TELETRONICS COMPANY OF AMERICA, 22035 Burbank Blvd., Woodland Hills CA 91364 USA

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