NEW FORMAT, NEW STYLE — THIS ISSUE!

How The Telephone Works

Dial Tone
Speed

IRS
System

Pay
Phone
Special

OVERSEAS DIALING
TECHNIQUES
Editorial

By Jack Kranyak

As TEL enters its fourth month of publication we can only be absolutely amazed at the reception you have given us. When we first started publication in November of last year we thought TEL would appeal to a small group of people to whom the telephone and the telephone company held a special fascination. Well, frankly we were wrong!

The question of course is, how does this affect you? Well for one thing the unexpected response, almost 10,000 subscribers to date, caught us unprepared to handle the basic task of getting that many magazines labeled with your names, sorted by Zip Code and into the mail. That alone was an obstacle, but not the only one. The very task of printing the magazine required a whole new approach.

At this point we were forced to take a good look at ourselves, and what we wanted to provide to you through TEL. Our old equipment, mostly one Selectric typewriter and an outdated label maker were simply not up to the task.

It was (and still is) our goal to bring you something which is just not available anywhere else on the “open market”. And we hope we have been meeting that goal. Each issue we try to give a good mix between highly technical discussions (see C.O. Operations this issue) and articles of more basic interest. These include pieces on the operation of the basic telephone instrument and interesting information on access numbers and codes.

BACK ISSUES

We are pleased to announce that back issues of TEL are now available. Due to the large number of requests for back issues we have started a new press run to meet the demand.

The issues available are: Nov. 74, TSPP; Dec. 74, Toll Free Dialing; Jan. 75, Area Code 900, Detection and Hold Button; and Feb. 75, Phone Bill and Answering Devices.

These issues are unreviewed original copy sent by first class mail in a manila envelope and cost $1 each. Please specify the issues desired and enclose payment with your order.

TEL SOLICITS ARTICLES

In order to make TEL more open to it’s readers we are adopting a new plan whereby by TEL will pay for readers articles used in TEL. Additionally, we welcome schematics and circuits for our line of plans.

We will pay between 10 and 15 dollars for material used in TEL and up to $50 for schematics used in our plans.

Material submitted should be typed with all illustrations in ink. We can assume no responsibility for any item sent and all contributions become property of TEL.
Overseas Dialing Techniques

By JOHN REYNOLDS

Until recently it was impossible to dial a call to a point outside North America (with the exception of Hawaii). However, a new service has been introduced that will allow direct dialing to points outside North America, with the exception of Hawaii. This service is called International Direct Distance Dialing (IDD).

The technique is quite simple. The caller dials the desired number, followed by the two or three digit code for the desired country, plus a one to six digit code for the city and finally the desired number. If the caller has TOUCH-TONE service he may dial the digit codes after the last digit, which will speed up the call, but is not necessary.

The IDD system, when new, will be available to home subscribers, and is similar to the method used by operators since the introduction of Multi-frequency (MF) switching. In this procedure, the operator keys: KP + 011 + XXX + ST, and waits for an international dial tone then KP + XXX + City Code + the desired number. The XXX is derived from the country code plus a 1 or 0 and will be explained in detail later. It is important that the call be completed as soon as possible after receiving the international dial tone — at most 7 seconds — because the location from which they were boarded.

The IDD system simply codes the TOUCH-TONE tones into MF tones and adds KP and ST at the proper places.

That is the basic system for “normal” overseas dialing. There are, however, some refinements which can be used for better results. (Continued on Page 12)
Pay Phone Special

In the course of the average day, many people will encounter a pay phone that is out of order (OD) for one reason or another. These people will usually place an out-of-order sign on the telephone, and go to another location to notify the repair service. His duty having been completed, the subscriber goes on his merry way, assuming that the problem will be taken care of in a short time. But what is not known is that the simple action of reporting an OD on a pay phone (PT) initiates a very complex maintenance and service routine performed by the coin maintenance craftsman. These complex routines are the subject of this article. We will now give a description of the chain of events incurred by the troubled report, beginning with the customer dialing the repair service, that is: when a PT customer wishing to report an OD calls the repair service, it rings into what is known as the Plant Service Center (PSC). This office is usually manned by a staff of trouble-reporting clerks. The customer gives the clerk the number of the OD PT and the nature of the problem. The clerk then writes up an inter-office trouble ticket and forwards the report to the appropriate test board facility, usually located in the PSC where the repair call was taken. Suppose the OD number is 553-2368. The test man will then take the ticket to his test position and proceed to get up on a no-test trunk (verification) in the 553 office, after which he will dial the 2368. He will then be abruptly connected to the OD circuit. Then by using his test equipment he can determine more closely the actual nature of the problem and whether the problem is located in the central office itself or at the PT. If the problem is located in the central office, he will ring down to the lineman, who will walk over to the switching apparatus in use by the OD PT in attempt to troubleshoot out. This might mean the unsticking of a line relay, etc. Should this occur, the lineman notifies the testman, who will file the trouble ticket with the records department, and continue on with other reports. However, of the men would resent paying a dime to report required information. These men also carry a small pouch in their tool belts that are filled with a pre-determined amount of coins, in different denominations, all of which are colored with permanent ink. This is done to insure that, should the craftsman loose money in a PT he is attempting to fix, the accounting office can take these colored coins out of the regular collection. By way of a coin craftsman out to the trouble location. "Relay* The craftsmen are periodically required to call in relay to report their progress. Under code these coins are returned to the proper man. It is, by the way, a myth that a coin craftsman has access to the coin box. His key opens only the upper part of the machine. About all he can do is poke a thin wire

DIAL TONE SPEED MEASUREMENT (part two)

By JACK KRANYAK

This article is the second in a series of articles dealing with telephone company plant engineering and maintenance. It is primarily intended for knowledgeable enthusiasts and plant employees who have a background in this field. Each month a topic will be investigated as we progress into the field of telephony.

SELECTION OF LINE EQUIPMENT TO BE TESTED

Measurement Error

The Dial Tone Speed measurement is intended to accurately show the DTS that is average for all of the customers in the entity or loading divisions for each hour studied. As these tests are not made properly done, the measurement error inherent in the selection of sample items is minimized.

Selecting The Lines

In making the selection of lines the following will want to be considered. One objective is to achieve a measure that reflects the variations in DTS that exists between Horizontal Groups, Line Groups, Vertical Groups and Line Load Control Groups. Recognize that this can be done even within Loading Divisions where they exist.

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March 1973

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Coming Next Month

ANATOMY OF A PHONE BUST
CENTRAL OFFICE OPERATIONS
Part 1: Step-by-Step Switching

TOUCH-TONE*: What it is. What it Does
CONSTRUCTION PROJECT: add four new numbers to your Touch tone phone

NOTICE
TEL welcomes letters from readers on all topics of interest, however we regret that due to the huge volume of mail we receive we can not answer each letter individually. Letters of general interest will be printed as space allows but we simply do not have the time to reply to the myriad of requests for technical information that arrive each day.

We do, of course appreciate your comments, and try to slant our articles to your interests.

Gentlemen:
I am a current subscriber to TEL and find the information very interesting. However, I do have several questions.

First, I am considering running an advertisement in your publication as a distributor of 'hard-to-get' telephone equipment for experimenters. I am currently in a position to acquire such apparatus that is not available through the usual electronic outlets. Would I be considered such an advertisement and what would be the rates?

Secondly, how many subscribers do you currently have?

Third, as with RAMPARTS magazine, it has been learned that our advertisers are asked to subscribe to a magazine which lifts up and even encourages illegal telephone activity and even describes how to avoid apprehension.

Am I sorry that your talents and efforts are directed in such a perverse direction. Would you please be so kind as to publish the balance of this subscription.

R.E.P.,
Tucson, AZ

TEL does not encourage illegal activity and is sorry for any misunderstanding.

Dear Sirs,
I have just received my first copy of "Telephone Electronics Line". Your statement indicates that your publication in no way constitutes a conspiracy to intentionally defraud any communication carrier nor do you support any illegal implements or actions on or drawn from your publication or its contents.

In the January issue you describe the techniques of "blue boxing" under the article "Modern Phone Phreaking" and then the "Detection, How To Avoid It".

I am sorry but I cannot continue to subscribe to a magazine which lifts up and even encourages illegal telephone activity and even describes how to avoid apprehension.

I am sorry that your talents and efforts are directed in such a perverse direction. Would you please be so kind as to publish the balance of this subscription.

R.E.P.,
Tucson, AZ

TEL does not encourage illegal activity and is sorry for any misunderstanding.

Fourth and last. Has your magazine been published on time?

Dear C.A.
I think you will find two of your questions answered in this issue. For the other two--first, we do not give out the names of our subscribers to anyone for any reason. Second, every Monday our new subscribers are mailed a letter every week. Although this letter contains no advertising, it is now being published and you will soon hear from the mail.

Dear TEL,
Although it has never been universally established, there are numerous cases in which calls have had to be removed from subscriber's bill, wherein a conversation never took place. Such as a small child answers the phone and does not know to hang up. In another instance, a workman—a plumber, working in your house answers only to say that there is nobody at home. Or perhaps a person answers who only speaks a foreign language and is unable to converse. All of these are unchargeable calls. In fact, in some cases if you get a recorder, but do not leave a message, it is not a non-chargeable call. In other words, you pay for a conversation with a real person.

R. G. T.
Moraga, CA

Pay Phone (Continued from Page 6)
down a 1/8th inch hole to test the level of the coins. This is usually done only when the coin receptacle is so full that the coins may back up into the coin relay.

Should the craftsman find any money, no matter how little, in the upper section, he must call the test board and deposit the found money in the PT. This is then totaled by the test board. The craftsman next writes up a collection ticket showing that the money was deposited. In the event of the coin box being full to the point of overflowing, the craftsman will call a special collection man, who will come out and empty the phone at once.

Occasionally there are certain craftsmen who do not follow the above procedure and pocket the cash instead. These men do not last long, as telco security is constantly springing traps on unsuspecting craftsmen to test their honesty.

Craftsmen are also required to sign for the keys they possess; which are stamped and have special keys that are stamped and die-cut on a special blank manufactured only by and for the tele-

Pay Phone (Continued from Page 6)

upon his arrival, the craftsman will open the upper-housing of the PT with his 29a key. He will then swing the housing out to a position perpendicular to the wall mounted portion. Then, he will attempt to determine the physical location of the OD condition in the PT. Having done so, he will fix and/or replace the faulty part, and write his ticket up as repaired. He will then move on to the next assigned repair location, loaded by the same repair call procedure; which continues this repair cycle.

To test their honesty.

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HOW PHONE WORKS

(Continued from Page 7)

Dialing and Switching

When you pick up a telephone handset, a switch inside the telephone closes, and the current flows through the telephone wire to the central office. There, your telephone is connected to a circuit that will put your call through.

The dial tone tells you that the circuit is now closed and the equipment is ready for your call.

Suppose you want to dial 555-2368. The first three digits identify the central office of the telephone you wish. The last four digits specify the phone number you wish to call.

For example, 212 is the area code number for New York City.

But back to your local call, 555-2368. You begin, of course, by dialing 5. When you release the dial it interrupts the circuit five times. Each interruption causes a capacitor to build up a small charge. When the circuit is closed again after each interruption the capacitor discharges it's charge and causes a pulse on the line. For the number 5 this occurs five times. Each pulse causes a relay in the central office to release the circuit five times when you dial the first five digits.

When later pulses, or tones reach the central office, they set many more relays into operation. Each relay that closes another connection, another link, in extending the electrical circuit. Each closed relay brings the circuit another step closer to the person you wish to talk with.

The first three groups of pulses (or the first three digits)—from the first three digits you dial—close relays to connect you with the particular central office you are calling. If the number you are calling is in your own central office, the first three digits tell the...
HOW PHONE WORKS

(Continued from Page 11)

After you reach your friend's central office, the last four digits you dialed are sent to the switching office. They are used to direct your call to the correct telephone. The operator then sends out a telephone to pick up your call. When your friend answers, his telephone is dialed by the operator. After your friend hangs up, the operator sends back information to the switching office. This information is then sent to other switching offices to connect your call to the desired telephone. The number of possible connections grows as the number of telephones increases.

OVERSEAS DIALING

(Continued from Page 4)

When your friend answers, he lifts his phone. The operator then dials the last four digits of his telephone number and asks for any change. If you have the "stuff" to be able to spend a lot of time on office calls or to use them in a similar manner. There is no language problem since all international operators speak English. It's the international telephone language.

If you can't "afford" to call overseas you can still call your foreign ring and busy signals sound loud. Try the following, all in the 212 area code:

363-8888 Norway/Sweden
363-8889 Switzerland/Denmark
363-8889 Italy/Luxembourg
797-8029 Greece/Spain
797-8087 Australia/Japan
797-8729 U.K./France
797-8798 Belgium/Germany

If you have the "stuff" to be able to spend a lot of time on office calls or to use them in a similar manner. There is no language problem since all international operators speak English. It's the international telephone language.

As a note of closing there is a companion tone to our 2600Hz clear tone in Europe, its 2400Hz, and may have a myriad of uses, such as calls routed through Paris on their way to L.A.

IRS

(Continued from Page 5)

against the totals you entered. If the numbers don't match, the computer kicks out the report and sends it to the "input processing" department where a human being decides what the problem is.

The computer doesn't have a data bank again, which checks your return. It couldn't, for instance, have copies of all your W-2s to make sure you listed all income. That check would come later, if at all.

If you used the long-form tax return-usually known as the 1040— all the information IRS needs to decide about your return will be considered. If it is considered for audit is on about half an inch of magnetic tape.

If you used the short form, it takes a quarter inch or less.

The Fresno center sends about 1000 of tape a day to the IRS National Data Center in Martinsburg, Va. Each reel has information on more than 150,000 individual tax returns.

If your return was rejected by Fresno's computer, you then send your return for audit. If it is considered for audit on IRS Intelligence and problems identified in past auditing experience.

The "random selection" IRS uses to find other returns for audit really isn't so random. Tax officials say that, to study specific areas, they will ask regional centers to select a number of returns with specific features.

"We might be asked to select 600 returns with dividend income over $1,000," one tax official said. "It's random selection, but within certain limits."

If you're chosen by the computer through the random process, the IRS sends your return to a prediaudit stage, where officials determine whether a full-blown audit would be worthwhile.

Of the more than 80 million individual income tax returns filed last year, 2% or 1.6 million were given a full audit. IRS hopes to boost the percentage this year, but with good reason: IRS is already stretched thin.

Of course, if you have been audited in the past or if your income is in a top bracket the chances you will be audited this year are much higher.

Only the IRS computers at the national center in Martinsburg are programmed for the DIF score test. If you're among those selected, a tape with your return's information is sent back to Fresno which then forwards your return to the local IRS district in which you live.

Full audits are conducted at the local office.

The Martinsburg facility also makes the decision on refunds. If the computer prints a tape with names, addresses and amounts which, in the Southern California region, is sent to the San Francisco Treasury disbursing office which in turn mails out the refunds.

It takes about a week for the average return to turn it through the Fresno center. But by the time the information gets through the national computer and makes it back to your regional office, the average refund takes about six weeks to reach your mailbox.

The Watergate scandal and revelations of alleged misuse of the IRS for political purposes (Continued on Page 14)
classified advertising

Starting with this issue TEL will accept display and classified advertising. Classified ad cost $1 per line. A line contains 40 characters, including spaces and punctuation. A box service is also available for those who prefer not to receive replies at their home address. The charge for a box is $2.50 per ad and includes forwarding of all replies by first class mail. Your address will be kept confidential.

Payment for classified advertising must accompany your order.

Also beginning with this issue, TEL is accepting display advertising. The minimum display ad size is 1/8 page. Please apply for rates.

The address for all advertising is: TEL., Dept. DA, 22035 Burbank Blvd., Woodland Hills, CA 91364.

EUROPEAN phone phials, I will be in Germany this summer and need info on how to DO IT in Europe: Box 47 TEL.

TELEPHONE equipment, dials, relays, plugs, unit cards, coders, switches, networks, key units, interceptors and much more. Write for list and price. Some quantities limited. Write today: Phone Stuff, P.O. Box 131, Coorl, CA 94929.

PRESENTLY have speakerphone, w/o-off controls on mic, for key phone. Need wiring diagram as unit will not work on Centerx but will work in my new building, which is equipped with PBX and dial 9 for outside, system. R.W. Box 29 TEL.

USED: Pimnay Bowers model 75-5 Metal address plate embossing machine. Cost over $3,000 new, only $1,300. FOB Woodland Hills, CA. Very good condition. Circulation Dept. TEL.

TEL FOR THE BLIND

TEL is now available on cassette tapes for our blind readers. The current price of $24 per year includes a copy of the regular TEL along with each tape. Single tapes are $2.50 each, with a copy of TEL.

TTEL cassettes are complete spoken versions of the regular issue, nothing is left out. In fact, the tape is "illuminated" with appropriate sounds and tones. To order, write: TEL for the Blind, 22035 Burbank Blvd., Woodland Hills, CA 91364. Please enclose payment with order.

THE LEGAL ASPECTS OF INTERCONNECTION

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

Due to unexpected developments in the legal arena, the book has been pulled back from the printers. We felt that to publish at this time would be to print a book that was obsolete from the outset. TEL has engaged a lawyer and learned that legal principles are changing. The book will contain pop-up text that will maintain readership during this period. This is the first of two releases, the second planned for June.

Horticulture Stimulator

Stimulates plant growth with 20 GHz. Can be used on a particular section of the plant or on the entire plant.

Photographic Pinhole Camera $300.

Small, compact, easy to build. Camera costs only the price of the film. Plans include proper exposure setting tables and film types that produce best results.

THE TELEPHONE EXPERIMENTER

COMPLETE CONSTRUCTION PLANS

TELEPHONE PLANS: $3.00 each

Automatic Dialer

Automatically dials a stored number, 60 in magnetic memory. Takes Touch-Tone or Dial and stored numbers. 100 in memory.

Conference Bridge

Automatically puts your friends on a conference call as they call in. Have three or four or more calls from your house phone.

Remote Control

Before you leave work, call your home and utilize this device to turn on the stove and heat your dinner. Avoidsburgers too.

Voice Scrambler

Talks and listens to your phones to the normal manner, but good luck if someone else tries to monitor the conversation.

Horticulture Stimulator

Stimulates plant growth with 20 GHz. Can be used on a particular section of the plant or on the entire plant.

GROCERY BUSINESS SUPPLY

WE GUARANTEE 50% OFF WHAT YOU'RE NOW PAYING ON YOUR SMALLER OFFICE SUPPLIES (213) 851-4132 851-6674

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