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=The Science of Telephone Surveilance=
=   Brought to you by Eric The Red   =
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Wiretapping

The Telephone is always a favorite target for the potential spy as it provides access to a capsule summary of many important decisions and transactions. It also offers a number of easy tap-in points which may not even necessitate premise trespass, and are generally harder to discover.

Numerous devices have been marketed by professional bugging suppliers to tap the telephone, and in some cases, even utilize the telephone as a room bug when not transmitting phone conversations.

Literally thousands of there devices which could be installed by almost anyone, were sold prior to the great surveilance scare laws. Access to commercial devices of this type is now pretty much limited to law enforcement bodies, although there is an undeniable blackmarket for "radio repaiman specials".

Common "conference line broadcasters" sold for as little as $30 for the schlock "private eye" suppliers in th late 60's, while a top law enforcement counterpart brings a couple of hundred bills from the more viably financed police and investigative departments.

The state of the art is such in wiretapping that it is possible to buy (or build) such exotic taps as the microphone which drops into the handset of a phone in as long of a time it takes to unscrew the cap, looks identical to the regular microphone, and broadcasts both sides of the conversation (using the phone's own electrical power) to a nearby FM radio.

Another popular exotic is the "infinity transmitter"; a small, cube-shaped device which hooks into the phone and jst lies there, hibernating, one might say, until the phone is dialed from an outside line (anywhere in the world - as long as it is direct dialing) and a small whistle blown into the mouthpiece of the dialing phone.

Upon "hearing" this sound the infinity transmitter stops the parent phone from ringing, and turns on the phones own carbon microphone or uses its own to broadcast the room's sounds over the phone line to the listening whistle-blower.

This device was popular (for those of us who had $400 dollars to blow on such things) gimmick for traveling businessmen who had an extension phone in the bedroom where their wife slept...A quick call from any port would let the listener know exactly what was transpiring in his absence.

In phone tapping, much as in most forms of surveilance, the key is the same: Keep it simple and direct. The less complicated a system, the better the chance of success.

Direct Taps

Phone tapping falls into two general categories; direct, meaning an actual electrical contact from the phone or line, to the listening post, or wireless, this latter being a combination of a phone tap and a mini-transmitter.

Direct taps are the easiest, and often the best. The quickest method of tapping into a phone is simply to locate a good point along the phone line, strip away the insulating cable to expose the four enclosed wires, strip away a small piece of insulation on the two hot (red and green) wires WITHOUT CUTTING THE WIRES, and attach a set of high impedence headphones. One side of the phones is directed through a small .005 mfd capacitor to keep out the 48 volt phone power.

With this simple set-up. the bugger has to go listen to the headphones whevever a call is made on the instrument in question. The disadvantages tp this system include spending most of one's time waiting for the phone to be used and then rushing to the garage every time it happens...It is often difficult to explain one's presence when discovered in such situations.

The next logical step up the ladder of progressive involvement is to add a small inter-satge transformer along with the capacitor. The primary of the transformer should be at least 10,000 ohms (but not over 20,000) to match the phone lines' high impedence, the secondary should be of a near value to the equipment it is going into.

This set-up provides a clear passageway for the audio (conversation) to pass through, while not loading the phone line. This "not-loading" is a real factor to consider, as a draw of over 20 mills or so might trip the central exchanges relay (trips around 40 milliamps) and send a phone repairman scurrying to the scene of the crime.

This output can be fed directly into a tape recorder, eliminating the crouching-at-the-phone syndrome. However, one must still endeavor to turn the recorder on and off at the proper moments, as task sometimes easier said than done.

To eliminate this final problem, one adds a tiny bit of sophistication; the drop-out relay. This is a small device that senses the condition of the phone line in question, and, through the remote start feature found on most modern tape recorders, turns the recorder on when the phone is lifted off of its cradle. This, of course, limits the waste of tape, and needs attention only when necessary to turn over or install more tape.

Another, more esoteric value of this set-up is the fact that it is probably the kind of thing used to tape record all the calls made out of the White House. Now, this in no way reflects on the quality of quality of the recordings obtained, with a bit of care one would not find any unexplained gaps in the tape...

It is possible to employ any of these methods at any point along the "pair", either as it leaves the phone, before the surge protector, on the drop cable running to the telephone pole, or at the terminal or junction boxes located on the pole or in the building's garage or basement.

The telephone instrument itself can be used as a microphone by any number of simple alterations (the addition of the infinity transmitter being the most common). Any of these alterations will allow the+;;+F{FK#+sF{&{{kkconversation when the phone is on the hook. To use either of these alterations,
the bugger simply connects a sensitive amplifier anywhere on the phone line.

1) The most common is to place a resistor across the hookswitch (this is the switch activated by the placing of the phone on its cradle). The resistor must be fairly low as to not throw the trip relay in the central station. This set-up allows a bit of current to trickle through the microphone and activate it, sending the conversation down the line much as an ordinary phone call will do, albeit at a lower level.

2) A capacitor can be installed across one side of the hookswitch allowing a bit of audio to pass on by, but keeping the DC current where it belongs.

In both of these applications, one side of the double pole hookswitch must be shorted out, leaving the open side to accept your device.

Near Direct

There is one other form of almost direct tap - the induction pick-up. These can be commercially purchased in electronics shops for a couple of bucks and are designed to be fed into a home tape recorder. They have a few important limitations? they must be physically attached to the phone, usually near the base or sidetone coil, to work properly, and also the volume level is not the best, and they are subject to AC hum from nearby electric devices.

A way around some of these limitations is to hide the induction coil in some little object (desk blotter, pen set, etc.) that may be placed near the phone, and then employ a small, direct-coupled amplifier to beef up the weak signals. In this manner, the induction pick-up becomes a bit more practical as it and the amplifier (and in some cases, the tape recorder) can be concealed in a drawer under the phone, or in a nearby artifact.

Commercial hidden induction units are sold by the usual law enforcement

suppliers cleverly secreted in such things as fake flowers (which only reinforces my dislike for plastic flowers), desk blotters, picture frames, etc. Most induction pick-ups have a small suction cup attached to make it easy to attach to the phone. Many pick-ups will even work on an extension phone even if though the extension phone is still lying peacefully on its cradle.

It is also possible to use a powerful induction tap near the phone line, but a real beefy amp must be employed and this sort of thing never works out quite like the spy movies would have us believe: be practical, stick to direct routes when possible.

A real classy method is to put the induction pickup INSIDE the phone, and have its leads run to the two unused (black and yellow) wires, where the bugger can use a normal bug to these two wires (but only in parallel) without ever making any contact with the main line.

Wireless

The other approach of the problem of not knowing what is said over your neighbor's phone is to secrete a small transmitter in the phone, or along the line, which broadcasts the conversation to a nearby reciever/tape recorder.

Telephone Tap Detection

Only the most amateurish wiretapper would betray his (or her) presence by producing spurious noises, i.e., "clicks" on a telephone line while in use. Most line noise is a naturally occurring phenomenon which does not indicate the presence of a third party on the conversation.

Therefore, bug fighting requires more than a mere surface understanding of the game. To begin the process, one should have more than a passing grasp of the dear old telephone company itself.

Telephone exchanges use a 48-volt DC power to operate their equipment. The phone is rung by inserting an AC ringing of about 20 cycles. The central telco office contains a series of frames wherein each subscriber's wires are attached to a set of contacts and a system of relays.

Your instrument is basically a microphone/earphone combination, a bell, a large coil (near the base of the phone) known as a sidetone coil, and a relay.

When the phone is on the hook, this relay is open. When you lift the reciever up from its cradle, the relay contacts are closed (in effect you are just closing a switch). When you dial, this relay is opened and closed a number of times (on a rotary phone). The central relay reads this series of openings and closings and then connects you to the proper set of contacts to reach the number you are dialing. On a tone phone, the tones sent down the line are decoded by the central office and you are hooked up.

When your wire leaves the main office, it is in a cable containing many similar wires, or "pairs" (it takes two wires for every phone). This cable comes to your pole where it goes into a junction box, and then to your house or apartment. When the pair reaches your residence, it comes to a device known as a surge protector. At this surge protector a third wire is added. This third wire is in the middle of the other two and is the ground wire.

From the surge protector the three wires (and sometimes a fourth, non-used one) run into your telephone. A number of bugging devices can be utilized in just about any of the aforementioned areas to record and/or transmit your phone conversations, and sometimes even just room conversations.

Types of Bugs

One of the most common types of bugs for the teley is the line powered parallel bug. This type of bug draws its power directly from the line and radiates a constant signal, whether the phone is in use or not. Its major advantage is lack of batteries (it can conceivably run for years). Its major disadvantages are: the constant signal makes it easier to detect, and the current it draws can often be measured.

This unit can be installed anywhere on the phone line (even on the pole) or in the phone itself. Although the in-the-phone mounting is considerably harder to effect due to limited access, it has the advantage of only operating when the phone is in use.

This type of bug can also be battery powered. This means a better range, and less chance of detection, but a much shorter life, or battery replacement at selected intervals.

A series bug is even more common. This unit requires the installer to actually cut the phone wire (rather than just attaching as in a parallel bug) and install the unit, but it only works when the phone is in use, and does not load the phone line at all when the phone is not in use, meaning the chances of the phone company detecting it are considerably smaller.

By utilizing a phone induction pickup (purchased at tape recorder stores for a couple of bucks) a bugger can actually tap a phone without any installation other than proper placement. The problems here are that the pick-up should be placed near the side tone of the phone itself (or an extension phone) and the output must be amplified before recording or transmitting. This type of tap is alos much more likely to pick up hum and generally be hard to understand.

The commonest method of phone tapping is to simply connect a set of high impedence headphones through a capacitor onto the phone lines, or add a small matching transformer and go right into a tape recorder. This set up will record both sides with amazing clarity. If a drop-out relay is added (or a voice

operated relay such as a VOX) to the tape recorder, it will only operate when a call is being made, thereby conserving tape and power.

There are a number of things one can do to help eliminate the chances of phone conversations being overheard by outside parties. These range from the simple, and as one might excpect, up through the very complicated. The chances of detection increase with the complexity, BUT if the bug is a fairly amateurish (non-FBI, that is to say) job, a few simple approaces will probably turn it up.

Phone Company

The Phone Company will help to some degree (assuming they are ot the ones doing the bugging - Ma Bell has done more than her share of this sort of thing, either for her own records or by leasing equipment and lines to law enforcement agencies...)

If a bug draws more than 40 milliamps of current it will automatically trip the central office relay, alerting Ma to some problem which needs the attention of a repairman, however, no pro or even semi-pro is going to install anything that will eat up this kind of power. You can call the phone company and ask them to run a check on your line for possible bugging and they will run a current check (anything over a 1 milliamp loss makes them suspicious) and listen for hum, unusual crosstalk, or other alarming symptoms. A simple check like this will often do the job...and best of all, it's free.

Telephone company will often also dispatch a special investigator to check out the line in person. If a tap is dicovered, the telco will remove it, restoring the customer's privacy, but will not help in finding, or the possible prosecution or the tapper(s).

If the tap does not tresspass on telco property (i.e. and inductive tap) they might not even wish to remove it, but will show it to you or refer you to local law enforcement bodies, assuming LOCAL LAW ENFORCEMENT BODIES DID NOT PLACE THE TAP...THE PHONE COMPANY WILL NOT FINK ON ITSELF OR LEGAL, "AUTHORIZED" AGENCIES...

Whether you elect to utilize the services of the friendly phone company or not, you should also plan on a self-search. This is done by examining the phone and its wires with a deft hand. Start with the wires...

Trace your phone wire to its wall plug and then from there throughout the basement, or wherever to the surge protector. See another little wire attached along the way and running into boxes or cabinets? Anything placed against the wire that could be a tap? Check out your "pair" into the junction box if possible (this is especially easy if you live in an apartment where the junction box can be quickly located). Any funny little wires or little gizmos hooked onto your pair?

Countermeasures

If you suspect you are the victim of an unauthorized telephone surveilance campaign, there are a few things you can do to lower your risks:

Keep your phone(s) locked up in a drawer when not in use and deny access to your premises to anyone, including cleaning people, without your constant surveilance. Always check any "repairman" and call to verify it with the phone (or gas - whatever) company.

Limit your non-critical calls to one phone and occasionally, only when it's important, use another phone on another line. However, if you make a habit out of this sort of thing, the other phone will get the same treatment. EvenKkphones have been bugged near a subject's house or place of business by over-zealous spies or law enforcement types.

You can use a commercial scrambler; these devices emply several methods to make the human voice sound unintelligible to anyone not equipped with with a like device. They have the advantage of screwing up all eavesdropping, including switchboard operators and chance listeners, HOWEVER, cheap scramblers simply remove a sideband of the conversation, or insert the speech patterns which can be defeated with a simple device and even expensive $500-a-set jobs can be defeated by anyone with the time and equipment to crack the scrambling code. Largy spy outfits (i.e. governments) employ computers to figure out the code and descramble with only minor hassle...

You can feed some sort of noise (radio would work fine...) into the phone when not in use if you feel the conversation is being recorded. This will actuate any voice operated or line-tripped tape recorders and cause them to waste their precious tape recording the top 40. This is especially good with the mini-jobs which can deal effectively with a maximum of 45 minutes worth of recording before the tape has to be serviced.

It is also possible to mess up a tape recorder by inserting some sort of blanket noise into th phone along with your voice. the poor quality mics and earpieces used in the telephone itself will not respond to much over 3,500 cycles per second, while tape recorders will often respond to 10,000 to 15,000 cycles with ease. If you take your trusty signal generator and feed a sine wave of about 8,000 or 9,000 cycles into the line (by direct connection) along with your voice (at, say 10 volts or so) it will often completely overload the tape recorder and saturate it with the tone, but still allow you to understand the person over the phone... This is best employed only at critical moments, not during whole conversations, to give the bugger less time to figure out what is going on.

However, the only real, sure countermeasure is not to say important things over the telephone.

Loose lips sink ships...