



Regulating the Phone Company In Your Home

The wizardry of America's Phone Phreaks has received considerable attention: in particular, the ability of this esoteric underground to make Bell Telephone's myriad long lines, loops and tandems dance to the calibrated tune of the notorious "Blue Box." But it has generally been assumed that the free long distance phone call was accessible only to those able to build such a Blue Box, and initiated in the mysteries of its use.

The following document which has come into our hands makes clear, however, that our phone company is in danger of being electronically ripped off not only by the technically knowledgeable and skilled, but by virtually anyone and everyone. The document demonstrates how practically anyone who can change the plug-on

an electric toaster—using only a screwdriver, a kitchen knife, and four dollars' worth of readily available electric parts—can build in two or three hours a simple device capable of evading charges on long distance telephone calls. This is not the Blue Box, which enables the user to make long distance calls free, but a version of the Mute Box, which enables the user to receive them free of charge to the caller.

BASICALLY A MUTE IS A DEVICE which allows you to receive incoming phone calls from anywhere without charge to the calling customer. By having all your friends call you, you not only eliminate most of your phone bill but at the same time reduce your friends' bill since they won't have to pay to call you anymore. And of course the usual signals can be arranged: you call person-to-person to your own name at your friend's number; he knows to reject the call, hang up, and call you back—free.

Following the directions on this page, anyone with only modest mechanical ability should be able to build a mute in a couple of hours (or less). The mute is a simple device which works on a very simple principle. Normally when you receive an incoming call, your local phone company sends a signal to your phone which causes your bell to ring (this is only to attract your attention). When you pick up the receiver, a small switch inside your phone closes, causing a moderately strong electric current to flow back along the line which stops the phone company's equipment from sending ring signals. Then the equipment sends a signal back toward the person calling you which starts the billing machine in his area.

Hanging up the receiver opens a switch inside your phone which cuts off the current flowing to the phone company. Their equipment then sends a different signal back to the other end indicating that billing should be stopped. The billing equipment then prepares the too familiar monthly statement which eventually is sent to the person who made the call.

There are two ways to avoid billing your friend: either you must send a false end-of-call signal to the other party during the conversation; or you must prevent the local phone company from sending the initial signal back to a relay at the other end which indicates that you answered the phone.

The most common form of mute prevents the initial signal from being sent. It does so by limiting the electric current (that flows through your phone when you are talking) to a level sufficient to allow a conversation, but not enough to activate the relay at the phone company. Thus, the phone company does not start billing the calling party. As far as the phone company equipment at the other end is concerned, your phone is still ringing, unanswered.

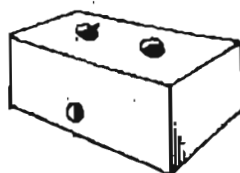
The way you build a mute is as follows: First, buy the following parts at a local electronics store such as Radio Shack. The store should have them all in stock (except possibly the capacitor); if not, they will refer you to another for the missing parts. (Do not get paranoid if your name

and address are asked; this is standard information for writing up sales receipts. But, if you're still concerned, have a phoney name and address ready.)

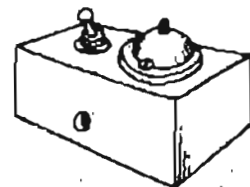
If you are not familiar with electronic components, you can ask for the parts by reading off the following list *verbatim* to the man at the counter. Do not hand him this article, since then he *may* become suspicious and report you to the fuzz. If you prefer to present a list of the parts, copy down the list below and hand him that.

Quantity	Description
1	0.47 microfarad mylar capacitor at 200 volts
1	5600 ohm resistor one half watt
1	single pole single throw (spst) momentary push-button switch. (The most convenient form of this is a simple doorbell button; it is referred to as such in the following instructions and drawings.)
1	single pole single throw (spst) toggle switch
1	a small plastic utility box large enough to put all of the parts with plenty of room for wiring the parts together; about 1½" x 4" x 2" will do very well. About 20 feet of insulated wire.

THE BOX



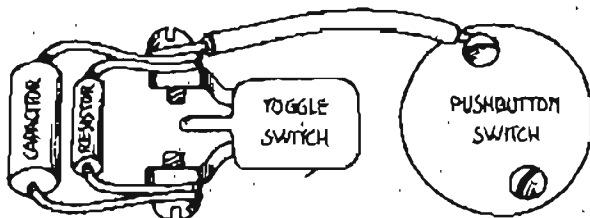
WITH HOLES
DRILLED



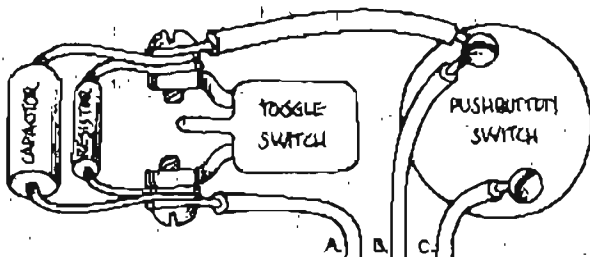
WITH SWITCHES
INSTALLED

Try to remember which part is which since it will help save time during construction. Try to get both switches with screwdown type terminal connections, since this will make soldering unnecessary. (If you have a soldering iron and know how to use it, however, go ahead; you will get more durable connections.) Also, if you get a metal "experimenter box" instead of a plastic box, you will probably need a power drill to make the holes. The holes in the plastic box can be made with an ordinary sharp kitchen knife that tapers to a point. Just use it as if it were a drill; the hole gets bigger as the knife blade goes deeper and you stop when it reaches the desired size. If, as these directions assume, you use screwdown type terminals and a plastic box, the only tools you will need are the knife and a fairly small screwdriver.

1. Make holes in the side of the box (which will be facing upward during use) for mounting the two switches. The size and location of the holes will depend upon the switches used. The toggle switch will usually require a single hole about $\frac{1}{2}$ inch in diameter; the doorbell button will require two small holes for the mounting screws plus a central hole about $\frac{1}{4}$ inch in diameter to pass the wires through.
2. Make a small hole less than $\frac{1}{4}$ inch in diameter (it should be just big enough for 3 wires to go through and fit snugly) in the side of the box (facing away from you during use).

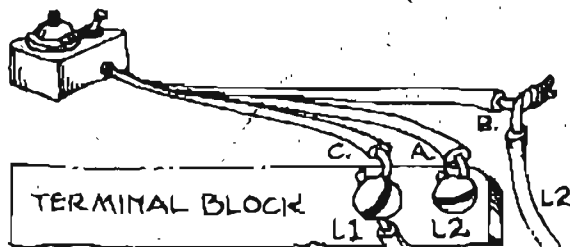


3. Take one wire from the resistor (the small part, usually brown, with the colored bands on it) and attach it to one of the terminals on the toggle switch; attach the other wire to the other terminal of the toggle switch. (Just wrap the wires around the terminal screws, but don't tighten them yet.)
4. Attach one wire from the capacitor (the large, usually yellow, part with the printing on one side) to one of the terminals on the toggle switch; attach the other wire to the other terminal on the toggle switch. (Again, just wrap them around, but don't tighten yet.)
5. Cut a piece of wire 4 inches long and strip $\frac{1}{2}$ inch of the insulation from each end.
6. Attach one end of the wire to either terminal of the toggle switch and tighten; thread the other end of the wire starting inside the box, and out through the central hole where the doorbell button will be mounted and attach it to one terminal of the doorbell button (but don't tighten yet).



7. Cut a 3- to 5-foot piece of wire (depending on how far you may want to keep the mute box from the phone) and attach one end of it to the terminal of the toggle switch which is *not* connected to the doorbell button (now you can tighten this terminal). Label this wire "A".

8. Cut off another 3- to 5-foot piece of wire, thread it through the hole where the doorbell button will be, attach it to the terminal of the doorbell button which is connected to the toggle switch and tighten. Label this wire "B".
9. Cut off a third 3- to 5-foot piece of wire, thread it through the hole under the doorbell button, and attach it to the terminal of the doorbell button to which you have so far connected no wires and tighten. Label this wire "C".
10. Attach the doorbell button to the box with its own mounting screws (probably two).
11. Mount the toggle switch into the box.
12. Take the free ends of the three wires and thread them through the hole in the side of the box and pull them out as far as they will go.



13. Take the cover off your phone. If it is a desk phone, there will be two screws on the bottom which hold the cover on (loosening the screws will free the cover; the screws do not come out). If it is a wall phone, there will be a catch on the bottom of the phone which releases the cover. Touchtone wall phones, princess phones, and trimline phones often have catches hidden under the tag which has your phone number on it. If not, look for hidden screws or catches. Some princess phones have screws recessed at each end of the bottom.
14. Run the three wires (A, B and C) into the phone through one of the holes on the back or bottom of the phone where they won't get in your way when using the phone, and pull them through far enough that you can connect them to any of the terminals on the terminal block where most of the wires in the phone come together.
15. Now do not be intimidated by the spaghetti dish of wiring and terminals you see. Only a small, identifiable portion concerns you. First orient yourself by seeing where the thick cable which connects the phone to the wall enters the phone. This cable contains usually 3 or 4 wires of different colors. Follow the plain green wire from this cable to the terminal on the terminal block to which it is connected. Attach your wire C to the same terminal (but do not disconnect the green wire from the terminal block).

For your reference, this terminal usually has a mark

reading "LI" on or near it, and it is usually located at the lower left corner of the terminal block (the LI may be a tiny, almost illegible imprint raised in the plastic of the block). If your phone has several wires coming through the wall cable, including two-colored (striped) wires, then look for the terminal markings rather than the wire color. The same applies for step 16. (Incidentally some phones have a little map of the terminal block pasted inside the phone. This will also help you locate LI.)

One more note: On princess phones the green wire may lead you to a terminal tucked underneath one of the solid grey metal weights placed inside the phone at either end. Don't give up. This weight is not hooked up to anything; with a little wiggling and a screwdriver as a lever, you can pop it out, and replace it when you finish your work.

16. Locate the red wire that leads back to the wall. Follow this red wire to the terminal on the block to which it is connected (usually on the lower left corner of the block and usually labelled "L2").
17. Disconnect this red wire from the terminal block (noting the terminal it came from). Attach wire B to this red wire (not to the terminal), neither B nor the red wire will be reconnected to the terminal block. You should wrap a little tape or piece of band-aid around this connection.
18. Attach wire A to the terminal from which you just removed the red wire in the previous step.
19. Put the cover back on the phone and pull the three wires out of the phone as far as they will go without ripping them out. You can wrap the three wires together with tape to keep them neat.

YOU ARE NOW READY TO TEST YOUR MUTE. Use the following test procedure (if any step fails, start at step 1 after making repairs).

1. Pick up your phone. If you get a dial tone throw the toggle switch to the other position. If you still have a dial tone, then you have a short circuit in your mute, and you will need to repair it. Label the position of the toggle switch which did not produce a dial tone "mute" for "muting position." Leave it in this position for step 2.
2. Push the doorbell button down: you should hear a click, and the background noise on the line should disappear. Hold the button down for several seconds and then let go: you should hear a short burst of dial tone. If you do not hear a click when you push the button, and a burst of dial tone when you release the button after holding it down for several seconds, you have a faulty circuit.
3. Throw the toggle switch into the non-mute position and listen. You should get a dial tone within a few seconds. If you do not get a dial tone, you will have to repair the

mute since, without a dial tone, you will not be able to make outgoing calls on the phone.

4. To run a full-scale test on the mute, have a friend call you long distance at a pre-arranged time. When the phone rings, set the toggle switch to the muting position. Then pick up the phone: you should hear a loud buzz on the line every 6 seconds and you should be unable to converse with your friend. (If the line is clear and you can converse with your friend, then the mute is not working and he is being charged for the call.)
5. Push the doorbell down for a very short period of time NEVER to exceed ONE SECOND. The line should now be clear, and you can talk with your friend (the buzz will keep coming on at 6 second intervals); but, if the line doesn't clear and you can't hear him or he can't hear you, then the mute isn't working.
6. Tell your friend to hang up, but do not hang up yourself: if you get a dial tone within 30 seconds, the mute is not working and will need to be repaired.
7. Find out from your friend whether he got billed for the call (to be extra safe, wait two months.) If he didn't, your mute is working. Congratulations!!!

CAUTION: If you leave the toggle switch in the muting position when the box is not in use, it will mute the ringing of incoming calls. Be certain the toggle switch is in the muting position *before* answering a call you wish to mute. Do not push the doorbell for more than ONE SECOND. And do not tell curious friends what the device is. Also tell your friends who wish to make a muted call to you, only to direct dial, never to call you through an operator or from a pay phone when you will be using your mute.

DETECTION: The mute works by simulating a situation where phone A tries to call Phone B, and phone B doesn't answer. Thus, while you are talking, it is as if the caller were hanging on and letting the phone ring and ring. To detect the use of a mute, the phone company has to try to "zero in" on what appear to be attempted calls where the caller persists in the attempt for an extraordinary length of time even though the call is not completed. (Anyone who has tried, for example, to get the information desk at a railroad terminal knows that this is sometimes a genuine occurrence.)

Because of the sheer volume of telephone calls and various technical difficulties such "zeroing in" has not proved to be very easy. There are a number of tests you can make to determine the kind of circuitry in your phone exchange and appropriate precautions you can take. But these are primarily for those who are going to engage in muted calls of considerable length. The simplest precaution, therefore, is to keep each muted call under 5 minutes, and, if you want to talk some more, have your friend hang up and call again. It would be irresponsible to pretend that all risk can be eliminated, but the safety record of such modest, under-5-minute muting has been very good. —R. OKLAHOMA