

EDITORIAL

by TOM EDISON



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MERRY CHRISTMAS AND HAPPY NEW YEAR

FROM THE TAP STAFF

- AL BELL
- TOM EDISON
- Mr. PHELPS
- D. J.
- DAVE
- CHARLES
- R. SYSTAT



This cartoon was sent to us by a New York reader; where it was from, if anywhere, is unknown but we wanted to share it with our readers.

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BLACK BOX BEATS BELL IN THE FOURTH!

We have had several issues dealing with Black Boxes, those wonderful little devices that allow the user to receive long distance calls at no charge to the calling party. This article will deal with the different designs that can be used.

The basic sections of most black boxes are the DC blocking capacitor, the power source, and the ring stopper. The DC blocking capacitor prevents the central office equipment from starting the billing procedure. In some areas as much as 10 milliamperes can flow through the line without starting billing, but why have any current flow if a capacitor can easily block it all? The answer is that by having a small amount of current drawn from the line, the power source can be eliminated, as we will see later. The capacitor should be .5 mfd. to pass the lowest voice frequencies. Raising this value only extends the low frequency response of the conversation, but does not greatly increase the volume. The capacitor should be non-polar, meaning it does not have a plus or a minus sign on it. If a polarized capacitor is used, the polarity of the line voltage must always match the polarity of the capacitor or it would lose capacitance and leak current instead of blocking current. The polarity of the line cannot always be guaranteed to remain constant, depending upon the type of phone office that serves the phone. However, if a line shows itself to be of constant polarity (required for Touch-tone phones) an electrolytic capacitor can be used, permitting a reduction in capacitor size. It should be rated at 150 volts or higher, at .5 microfarad, non-polar (which means non-electrolytic), and if electrolytic, it can be as high as 100 mfd., though only .5 mfd. is necessary.

To talk back to the calling party, the owner of the black box must have a small DC current to operate the carbon mouthpiece in the handset. By bridging the capacitor with a 10K resistor, enough current flows to activate the mouthpiece without drawing enough current to start billing. Some designs use low values like 5.6K but this does not insure that the equipment will not begin to bill for the call. To get a louder signal back to the calling party, a battery and a resistor can supply the talking current without drawing it off the line. 25 milliamperes is a good current. The resistor needed can be calculated by Ohm's Law:

$$\text{Resistor (ohms)} = \frac{\text{Battery Voltage}}{\text{Current}}$$

Example: $1 \frac{1}{2}$ volt battery uses a $\frac{1.5}{.025} = 60$ ohm resistor.
8 volts = 240 ohms, 9 volts = 360 ohms, 12 volts = 480 ohms.

The ring stopper allows a large surge to flow through the line for only an instant. If it doesn't flow long enough, the line doesn't stop ringing, and listening to the phone with the Black Box switched on one would hear a loud ringing sound. In between these rings one can usually talk to the caller, but this only works on some electromechanical exchanges, whereas in ESS systems (Electronic Switching Systems) the voice circuit is not connected until the called party answers the phone. Talking between rings can be difficult but it is cheap and Tricon did say we'd all have to make sacrifices before he plucked out of office. This method is almost immune to detection for the black box detectors available only test the line after the ringing has stopped.

If the ring stopper allows current to flow for so long, the phone equipment will think the phone has been answered, and then of course hang up, so the equipment will disconnect and send a new dial tone in 10 to 30 seconds. The ring stopper usually works best by letting the surge last just long enough to stop the ring, and no longer.

The Basic Black Box is illustrated in Figure 1. When the switch is opened, current and sound can only pass through the resistor and capacitor. They work as already described in the sections under DC blocking capacitor and power source. When the switch is closed, the phone acts normal.

To perform the ring-stopping function, the switch is closed and the phone is quickly picked up and hung up. Then the switch is opened and the conversation can take place. The circuit in Figure 2 is from Abbie Hoffman's *Diary*. This Black Box circuit is basically the same, but the capacitor is now 100 mfd. When a call comes in, the switch is opened, and the phone is then picked up. The discharged capacitor soaks up a big pulse and thus acts as the ring stopper. After the pulse, it doesn't charge itself up any more and then performs the DC blocking function. Obviously the size in mfd's is critical in this design because it determines the length of time that the pulse lasts. When the switch is closed to make the phone act normally again, the huge capacitor is discharged by the switch through a 10 ohm resistor that limits the current. Without this resistor, this big capacitor will be damaged by the discharge surge.

Figure 3 shows a similar circuit that uses two 50 volt zener diodes back to back to stop the rings. To answer, the phone is picked up after the switch is opened, and the ringing voltage avalanches one of the zeners. The surge makes the line voltage drop, thereby taking the zener out of avalanche. This ring stopper is very quick, and is recommended by phone phreaks who are served by sensitive equipment. Figure 4 uses a simple push button for the ring stopper. This provides manual control of the timing of the pulse. It can be hit quickly, and if it doesn't stop the ringing, it can be hit for slightly longer and longer times until the ringing is stopped. The power source is a 6 volt battery, which can be a 4 cell flashlight string together in series. The simplest Black Box circuit published to date has been the one in Issue 11 of TAP (YIPL at the time). The capacitor is built into the phone, the ring stopper is the pick up and hang up procedure, and the only parts needed are a 10K resistor and a SPST switch. We have plans for the same thing for Automatic Electric phones for those customers of General Telephone and for Western Electric phones serviced by Bell Companies.

Calls on Black Boxes are usually kept short for safety, and of course no other extensions can be picked up during the call or the call will be billed. Most phone phreaks remove Black Boxes from their phones and do not use suspicious activities on their phone line. For the ultimate simplicity in Black Box design, see letter below.

Dear TAP,

Here is a description of a poor man's mute. It requires no parts at all, just a trimline style rotary dial telephone. Here's what you do. When you want to mute a call pick up the handset from the cradle slowly and at the same time keep the bookswitch in the base held down with your left hand. Now with the hand holding the receiver move the dial as if you've dialed a "1" and let it return halfway. Then release the hang-up switch on the case. If you have done it right you will hear the ringing coming out of the earpiece, so to stop the ringing move the dial slightly back and quickly return it to the middle position. You will now be able to hear your friend but to talk to him you will have to yell into the earpiece, because the earpiece doesn't work on this cheapie mate as there is no resistor to let current through. One should practice manipulating the dial before trying to mute a long distance call.

This mute is very primitive, but the beauty is the fact that no alteration of the phone is required, so no evidence in case of a bust. Any dial type trimline will work. It won't work with other phone types because the earpiece is short when the dial is moved, so you would have to remove the spring wire from the dial, and if you're going to do that you might as well go ahead and put in a resistor and switch. So let's see those trimline phones for which you pay extra! put to pasture.

-CALIFORNIA-

Letters From Readers

Dear TAP, This is Capt. Crunch, I would like to mention a few things. First, I'm glad to see you boys back in operation & am curious to why you stopped publication for a while. I also want to state my willingness in contacting as many would-be phreaks as possible, in person only & not by mail. Therefore I am offering to anyone who wants to come see me in Mt. View all I know in electronics, computers & related technologies including freaking of course. However I dislike talking on the phone, nor communication by mail. If you even receive this letter, I would consider it a miracle. My current address is: J. T. Draper, 1305 Montecito Ave. Apt. #6, Mt. View, Ca. 94040 for those who want to set up a meeting by mail. Phone is (415) 964-9041 and 965-4210. Of course I am not underground. A while back National Review published my phone number in the hopes that people would buy me by calling at 3 am etc. They didn't realize that I made hundreds of new friends & taught hundreds the art of freaking. Any people who want to visit me are welcome. They can stay with me up to a week (it usually takes that long to teach them). You might want to publish that fact.

I am starting a computer data-base of info for phone phreaks & computer freaks. This data base will reside in the computer company I work for. There are 3 access levels of security which are:

1. General- Everybody and Anyone.
 2. Protected- For sensitive numbers that would be changed if widespread.
 3. Secure-Random scrambled data, accessible only over a non-tapped direct connection I cannot discuss here.
- Cost: 96¢/hour connect time charges, 12 midnight to 6 am. (PST), 3 am. to 9 am. (EST). Time includes IC and uses Standard TTY terminal. No WATS lines so people will have to figure out how to call it- Anyone interested, call 964-5331 (415). This is a company called "Call Computers". It uses an HP 9100A with 100 Megabyte storage. A very top secure system, this is not a cheap HP2000F system but a much better BTI system- "Basic Timesharing System". So far we have 30 or so people, each with their own access code. I usually give a lot of information this way, more so than by phone, but less than in person. It's cheaper than Western Union, more secure but of course calling the computer costs money (or does it?). One could use credit cards because if the operator tried to call back a data tone would be reached. Good luck.

-JOHN-

ASK Mr. PHELPS

Dear Mr. Phelps, I've been hearing rumors from friends that the phoners are changing the tones in the Fortresses phones around New York and that by January 1976 the Red Box will be obsolete. Is this true, and if it is, does anyone want to buy antique red boxes?

-DISCOURAGED-

Dear DISCOURAGED, I'm passing this letter on to me. It is true that the phone company is modifying the pay phones, but don't give up! We've discovered that the reason for modification is to allow automatic machinery in the future to replace all the human operators who presently listen for the tones and tell you how much to put in. This will actually make it easier to use Red Boxes than it is now! To prevent the machinery from accidentally being tripped into thinking money is deposited by the caller's voice frequencies, the phones are being modified to generate two tones instead of one, but the timing of the tones is exactly the same. The old tone was 2000 Hertz. The new tones are 2000 and 1700 Hertz, so all Red Boxes can be easily modified by adding the 1700 Hertz oscillator and making it in at the same volume to the old oscillator. Plans for doing this will be published in the next issue of TAP, in time for the modifications of the pay phones to be near completion in New York.

Advisable Missions Force

Dear TAP, I just had a new phone put in upon which my previously perfect black box no longer worked. It took some time but I finally realized that the red wire (from the wall to the L2 terminal) was backed up by the black wire (from the wall) which is not normally used in the phone hook-up (but which on my new phone was also connected to L2). Easy remedy to this of course is to remove both the red and black wires from L2 and connecting them both to the proper wire on the black box.

Phone installer friend of mine told me he was told to hook up both wires from now on but he didn't know why.

-CONNECTICUT-

Dear TAP, Want to advise your readers how to get additional phone equipment from Pa Bell for free. I just got a long type stretch cord that the business office bills \$22.50 for. The way to do it is not to deal with the business office but with repair service instead. Break any existing equipment you have (say you saw a snip and take commercial and cut your phone cord, then postpone moving) and call repair service. When they come, the guy will give you whatever alterations you wish. Not only did he give me a new cord but I got a new phone too. He said repair service would only forward a bill when this becomes habitual with a person.

-NEW YORK-

RAO Credit Card Codes

Area	RAO Codes and Locations	416	476	Toronto
001	094 Newark, 091, 093	501	147	
232	032 Wash. DC, 033	502	650	
203	020 Hartford, 010	503	131	Portland
206	163 Seattle, 167	504	046	
239	254 Stockton, 289 Fresno	505	105	
212	072, 074 N. Y. C., 017, 018, 021, 024, 022	509	128	Spokane
213	183, 184 L. A., 046, 182, 187, 332	513	185	
215	041, 042, 043 Philadelphia	516	127	Long Island
216	050 Akron, 062 Cleveland	517	224	Lansing
218	126 Duluth	601	059	
301	011	602	064, 065	
302	223	604	493	Vancouver
303	153	608	201	
306	044 Miami	612	126	St. Paul
307	137	613	473	
308	097 Omaha, 237	615	047	Nashville
312	097 Chicago, 098 Suburbs, 234	617	001	Boston, 023 Worcester,
313	083 Detroit, 013, 096	702	271	007, 038
315	177 St. Louis, 143	703	033	
401	019 R. I.	704	319	Charlotte
404	035 Atlanta, 022, 025, 063	713	151	Houston
406	184 Montana	716	534	Rochester
408	203	801	187	Memphis
412	030 Pittsburgh	914	066, 141	
414	088 Milwaukee			
415	158 S. F., 167 Berkeley, Oakland			

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 - 16- Red Box, Line Relay, Don't Get Busted
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 - 19- Cheese Box Conference line, or loop-around
 - 20- Automatic Phone Tap, Convention Report
 - 21- Amuseuro, "How we catch Red Boxes"
 - 22- Free Electricity
 - 23- Free Electricity, Index of TAP issues, 1974 CC Code
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 - 25- New Bluebox, Con Ed key (also 23, 29)
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This Does Not Compute

...there were several phreaks and technological mavericks who used blue boxes. Black boxes and other colored boxes to force AT&T out of a few dollars. Now, it may be the dawn of a new space age, but the kids are crazy.

New Scientist magazine reports that a 15-year-old London schoolboy named Joe used a school computer terminal to crack the security system of one of the biggest time-sharing computers in England. With no formal computer training and just four months of schooling, Joe was able to gain access to top-secret information from several big business files and so far as we know, change the data stored in the computer.

Spokespersons for the computer involved (even a computer has spokespersons these days) admitted that the boy wonder was in a position to completely take over the entire system, shutting off other users, changing passwords and altering bills sent to customers. And Joe could have gotten away with it had he only kept his young mouth shut. Instead, he was caught. Note completely profane what he had done. A new security system for the computer was immediately installed.

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