



Exploding The Phone

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- Keywords** phone phreaks; Australia; step-by-step exchange; crossbar exchange; Ramparts; AT&T; mute box (black box); blue box; Australian phreaking
- Source** An anonymous phone phreak

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NATION REVIEW

You don't have to be a weatherman

SEVEN DAYS a week, fifty two weeks a year, in a peak hour slot between seven and eight pm, the ABC disseminates one of its intellectually most dubious products: the weather forecast. Half an hour's conversation with an honest meteorologist will convince anyone that while the observations have been made with due care and at great expense, the predictions have little certainty and the track record is nothing to boast of.

In this, of course, Australian weather forecasters do not differ from their colleagues abroad. But the dubiety of meteorological predictions is not disclosed to the ABC's dedicated viewers. Fred the farmer likes to be assured that the scientists up there are doing their job, come rain come sunshine, and announcers wearing smiles and short back and sides are there to reassure him night after night.

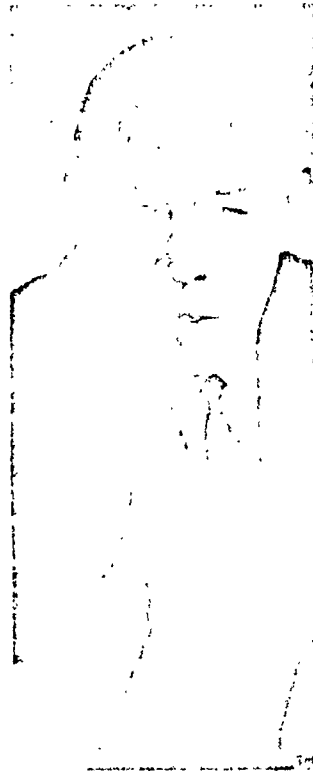
This charade, needless to say, is politically unbiassed.

The same lack of internal criticism and investigative reporting permeates vast wastelands of ABC television time. When have the educational programs taken a hard look at the six state education systems? Likewise, the ABC's reluctance to engage knowledgeable and critical journalists have intermittently made it the target of public relations firms plugging dubious mining companies (films perhaps for free), and have made it rely on the US Information Agency for science films, which by edict of congress and because of their heavy pro-administration slant, are not to be shown within the United States.

When domestic science affairs are to be discussed, as they were in the notorious *Nuclear game* program last year, the ABC's own science experts are precluded from taking part. By the latest decree, TV science is to be taken away from the science unit and handed to the features department.

For these longstanding, institutional reasons, it has come about that virtually all the probing journalism on the screen, all the investigative reporting, is fitted into the current affairs programs - of which *TDT* and *Four corners*, because of their timing, are the best known.

And so everybody wants these two programs to be perfect,



The Australian Scene

Phreaking into the sys

This article is published by way of a public service and dedicated to the postmaster-general, sir Alan Hulme.

Sir Alan, until you read this article, you will not have any idea of what intricate methods are being used to cheat yourself and the public purse of valuable revenue. This is your time to act, sire: when you learn in detail the depths to which these fiends have stooped.

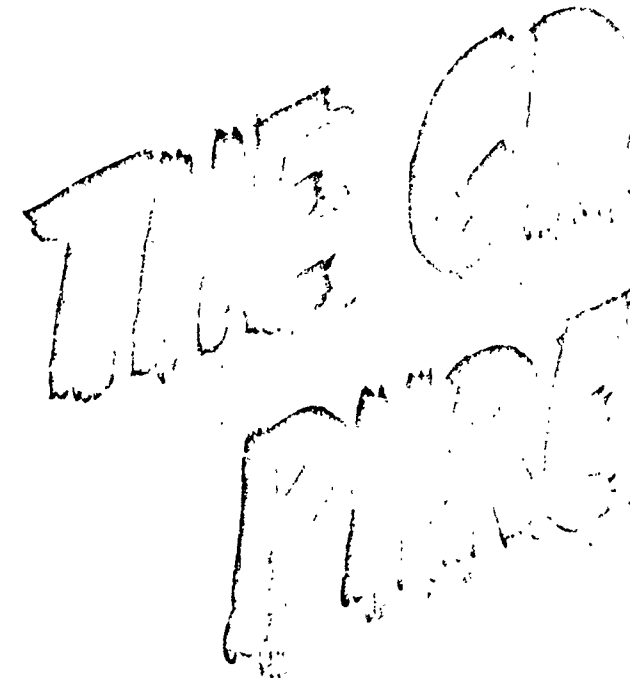
After careful consideration and knowing something of your past performance, we felt there were no other means we could use that might stir you to action. Now that the enemy appears to have your ABC, please save our phones.

NATION REVIEW

EIGHT DAYS ago, the officials of two of the country's 16 postal unions lifted a corner of the curtain hanging over one of the country's growing and, to its devotees, intensely absorbing cults: phone phreakery.

The unions were on the eve of a week's lobbying expedition to Canberra where they hoped to explain how the postmaster-general was reducing postal staff while spending vast sums of money for the services rendered by outsiders and for equipment bought in order to save labor. In order to dramatise the case, the unions disclosed that their own members had developed a device which prevented calls from being registered on a meter, at a cost of 75 cents. They added that for the cost of another 25 cents, this device can be made undetectable by the PMG.

The point the unions wanted to stress was that sums



employ top grade technicians, but lower paid "electri

no program to go on the air.

The proper yardstick for current affairs programs is not that they be "unbiased", but first, that they be accurate in the case they draw up and that they allow the right of reply. For lack of any other local comparison, the legal system might be looked to. The taxpayer pays for both the prosecuting attorney and the judge and a public defender in the case of poverty. When public institutions themselves are in question, the taxpayer foots the bill for both the royal commissioners and for counsel assisting a commission.

The ABC's current affairs programs have had their quota of errors. Compare them, however, to their commercial rivals, such as the one which transmitted that mixture of fact and fiction, Alan Reid's budget forecast. Or compare them to newspaper reporting, checked against the letter columns, which set out corrections or purported corrections to articles day after day.

If the public is ever to know the full score about these ABC programs, it would require to be told something about the proposals turned down each day and the projects stopped after the research briefs have been drawn. It would also need to have a careful record of the canning of finished programs by management, a matter on which it does get occasional leaks. It's this canning which gives rise to a suspicion of the ABC leaning over to please the incumbent government.

Against the ABC management's apparent record, before programs come on the air, the happenings of the past ten days have the elements of a bad farce. Sir Alan Hulme throws a pie in the face of the current affairs personnel, who can't throw it back, but are called in by that honest, bewildered soul, sir Robert Madgwick, who wants them to back the management so that the commissioners might be relieved from the hard work of previewing current affairs programs. Meanwhile management issues edicts about which cartoonists — from the outside — mustn't be used and sounds warnings of another sheaf of memoranda in the pipelines.

In another month, in another year, you would go away and laugh, or yawn. But *this time* you know it's all really about the elections. You know that the current affairs programs, once taken off and their budgets dispersed, won't come back so quickly. You know, too, that this threat hangs over the jobs of several dozen people involved, many of them on contract to the ABC, not permanently employed. You sympathise with them against charges which the context, and the politics of the speakers, tell you are electoral for the ABC, but you just about manage one — because there's little else to cheer about on that idiot box.

savings. To the public eye, the modernisation and expansion of the phone system has been presented as an improvement in service, enabling them to make trunk calls between localities by direct dialling. This is known as the STD system.

Why is the PMG unable to say how much was actually spent on the STD system? It came into being as part of an overall scheme to replace the traditional step-by-step telephone exchanges (as they are technically known) by the present crossbar exchanges. The advantage of the crossbar system is that it takes up less space and needs much less skilled labor to maintain it in good order. How much of the crossbar system should be assigned to STD hasn't been worked out.

Phone phreaks are now demonstrating that the automation of the exchanges makes the system highly vulnerable in a way operator-connected systems are not. This vulnerability may have been known to the electronic manufacturers for at least two or three years, but there is no evidence that they have ever told the Australian PMG about it. It is fair to ask whether it is the manufacturers or the phreaks who are hijacking the PMG.

The unions have been a little slow in making this discovery. The devices that their own members have now developed, however, with the help of inside knowledge of the system, are possibly a little ahead of what the phreaks are doing.

The unions' delay in turning their attention to the phreak phenomenon has a relevant history. The introduction of crossbar exchanges, designed in Sweden by the LM Ericsson group, and manufactured in Australia by Ericsson's local subsidiary, was not initially followed by staff redundancies among skilled maintenance men, organised by the Postal Telecommunication Technicians Union. In the smaller, rural exchanges, the union's members were able to enjoy the reduced maintenance labor required of them. In some of the capital cities, the technicians were brought in to look after the notorious "letter shredders", the automatic mail sorting machines which kept on going wrong.

This year, however, the Postal Telecommunication Technicians and other unions have become aware that their members are not being replaced as they retire and that the "letter shredders" are being complemented by new Japanese sorting machines, made by the Toshiba company, on which the PMG no longer proposes to

professional engineers. The union has now joined the campaign against high-cost mechanistic outside contracting. It can't have taken it many years to perfect the phreak devices.

The outside phreaks

Meanwhile, the outside phreaks have been. Unlike acid dropping, gay lib, or organically food, Australian phreakery owes little but the name to its American counterpart. Being largely of Swedish design, Australia's telephone exchanges, and the way that communicate with it, work on quite different principles from the US facilities.

Local phreaks have therefore had to use their ingenuity and possibly their inside contacts to deduce its workings. The suggestion made by one union of that phreaks constitute an international underground that exchanges its technology is an overstatement.

A good example is the design of the US "mute box" which reached Australia some two or three months after the design had been published in the Berkeley-based monthly *Ramparts*, and its effectiveness was instantly recognised by the American Telephone and Telegraph Company, who obtained a court order for the publication of *Ramparts* June issue. Some subscription copies, however, reached Australia, and the design outline there was instantly tried out.

The result was a total failure. The "mute box" described by *Ramparts* was intended to be attached to the telephone of the person called. On hearing the bell and picking up the receiver, the subscriber would throw the switch of the mute box, previously attached to the phone, thereby suppressing an outgoing signal which activates the meter monitoring his caller's set. In effect, metering, no charge.

But Australian sets have no such outgoing signal. When you lift the receiver, the AC current which rings the bell changes over to DC current and a complete circuit between caller and called is established. Within this circuit lurks a relay, and it is this relay which activates the caller's meter. The technology of the US phreaks was irrelevant.

Recent investigations show that Australian phreaks have developed at least three devices for making free long distance calls. Although different in structure, two of them are analogous in function to devices used in the United States. They are therefore called by the same names: "mute box" and "blue box". The third device is simply

PHONE CONSPIRACY



tone signals are far less common. One indicated use is in multicoin public telephones, where the coins inserted on a trunk operator's instructions release tones when they drop through the set into the money box. Only three tones are believed to be used to signal the amounts of money, but they are permuted to convey the message setting out the money put down the slots.

The simplest way of simulating tones without actually putting money into the call box is to taperecord the sounds generated by a call which has actually been paid for, and thereafter to play back this signal into the microphone. This kind of simulation applies only to calls of a similar cost. Genuine phreaks tend to reject the tape recorder, because it doesn't involve the intellectual effort of decoding the system of signals, nor the electronic circuitry that they admire.

The genuine blue box is a tone generator, a device which phreaks state can be constructed by any middling to competent electronic technician or engineer. A tone generator for PMG frequency signals cannot be purchased complete, but phreaks think an underground market might develop. Besides the usual circuitry (transistors, capacitors etc), the blue box requires an amplifier which emits the tones. The amplifier held against the microphone into which the caller later speaks.

In view of the possibility of marketing the blue box, phreaks have been unwilling to disclose its detailed and most economic construction.

Junction box trick

For the past two or three years, it has been common knowledge in the student underground that, through a small number of public telephone boxes in Sydney and Melbourne, free calls could be made interstate for the price of local calls.

Most users do not understand how this happens. It is possible that some kind of defect in the exchanges may have developed.

But phreaks claim that this breakthrough can be reproduced in public booths having a junction box. To discover whether a booth has a junction box, you follow the wires leading downward out of the telephone set. They may lead to a small, plastic box, technically the junction box. Phreaks claim that they

ring of some types of public phones, which then
long distance calls for the price of local calls

universally available parts are purchased:

Phreak ambitions

The three devices explained appeal to phreaks with proletarian sympathies. Some of them exercise their ingenuity by applying themselves less to the saving of money and more to pitting their minds against the most difficult parts of the communications gadgetry.

While US callers can dial through automatic exchanges to places like Paris and Moscow, most overseas calls out of Australia go through human operators. Some phreaks, however, believe they might be able to by-pass the human operator and get directly on to the switchboard that makes the overseas calls. On inquiries made last week, phreaks may have pushed this ambition a certain way, but they haven't yet crossed the ocean.

A second phreak ambition is to decode the PMG's internal call system by locating the numbers of free lines. If you have ever had a telephone repair man come to your house, you will have noticed that he calls directly to certain exchanges and then asks to be put through to elsewhere. These calls are free. Since the free numbers involved could easily get into general circulation, either through technicians telling their friends or through their leaving their jobs, the PMG changes them frequently. Phreaks accordingly don't worry much about this kind of inside knowledge, but they believe that internal numbers operate over a closed range which holds other opportunities.

The most ambitious phreak aspiration — and one which is truly international — relates to the many unused communications satellites now circling the earth. The satellites are believed to be operating on a band of reserved frequencies and to require a narrow beam which can be generated by a transmitter with relatively low power. Fellow phreaks who have receivers taking the relevant bands could then tune in to the signals stored and retransmitted by the satellites.

Apart from the initial cost of constructing the transmitter and receiver, phreaks would incur no further cost in talking to each other round the earth. There may be problems in computing the positions of the satellites as well as in ascertaining the frequencies on which they would operate.

At this point, phreaks join the oldest of electronic hobbyists — the radio hams. They are on the verge of becoming respectable.

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- C. One only 6-pole, triple-throw switch
- D. One only diode with 400 volt reverse breakdown
- E. Insulated wire.

Total price for parts A-D is \$3.65. The wire is likely to be in possession of anyone capable of putting this device together. The diagram below sets out the circuit in which these parts are connected.

The mute box once constructed, the next step is to connect it to the telephone. This is done by opening up the set. The screws that hold the cover to the base plate are first undone. It will be found that the set is connected to the exchange by two wires which may vary in color and exact position according to its model. Typically, the red wire in the set is removed first and Wire 2 shown in the circuit diagram is connected to the board in its place. Wire 3 in the diagram goes to the other terminal in the set. Wire 1 then connects to the terminal from which the wire has been removed. An operative mute box has been installed.

How is it worked? When the phone rings, switch X is pushed to the mute position. The receiver is lifted and the ringing signal should be heard through the amplifier that is pressed against the ear. Switch Y, the large switch in the box, is then thrown through its three positions. You are talking.

Using this device, a free call will last for 90 seconds. At the end of this period, an automatic test signal will emanate from the crossbar exchange to test the relay. If the relay isn't activating the meter (and the mute box sees to that) it will break off the call.

If the talkers have more to say, they will have to go through the procedure once more.

Automatic detection of the mute box operation is not possible with present devices. The only way of catching mute box users is by random monitoring of lines by human testers — a measure which would defeat the labor saving inventions of the automatic STD system.

The blue box

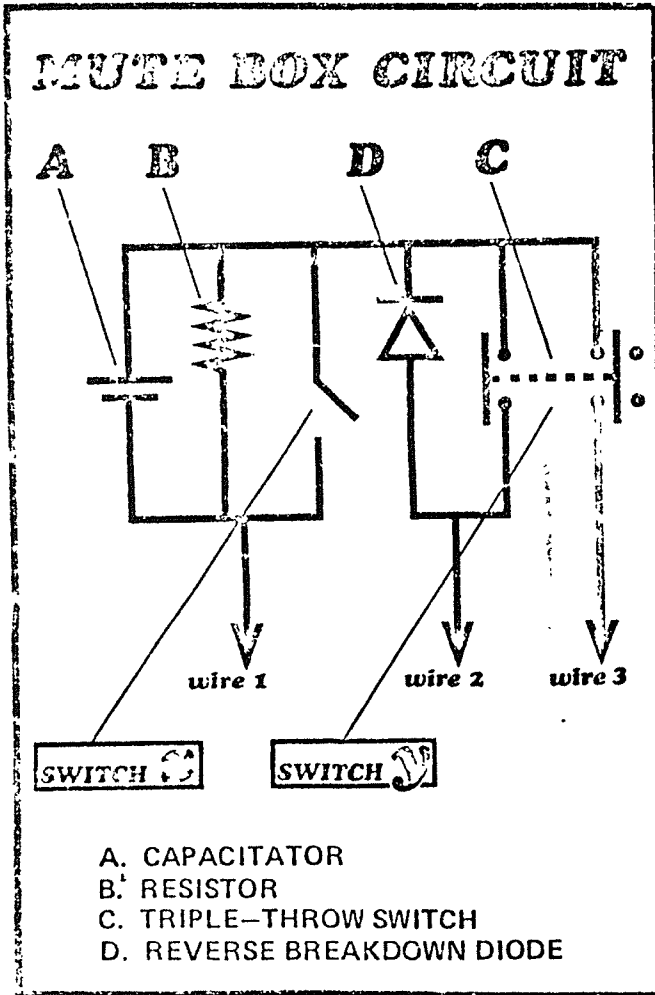
The function of a blue box is to simulate the frequencies of tones which are used in a telephonic system to open entry to certain circuits. The popularity of blue boxes in the United States derives from the widespread use of tone signals.

In Australia, on what is so far known to phreaks,

The function of this device is to deactivate the "B-relay" in the circuit between caller and called. It is joined on to the set of the called.

In order to beat the system, by freeing the caller from charges, the mute box can be worked two ways. First, the person with the mute box can use an agreed signal or time to call the person he wants to talk to; his friend doesn't lift the receiver, but instead calls back. Where people call each other regularly, both parties may install a mute box.

For one known design of a mute box, the following,



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